SYSTEMATICS AND TAXONOMY OF AUSTRALIAN BIRDS

LES CHRISTIDIS AND WALTER E. BOLES

SYSTEMATICS AND TAXONOMY OF AUSTRALIAN BIRDS

LES CHRISTIDIS AND WALTER E. BOLES

CSIRO
PUBLISHING

National Library of Australia Cataloguing-in-Publication entry

Christidis, Les.
Systematics and taxonomy of Australian birds.

Bibliography.
Includes index.
ISBN 9780643065116.
1. Birds – Australia – Classification.
I. Boles, Walter. II. Title.

598.0994

Published by
CSIRO PUBLISHING
150 Oxford Street (PO Box 1139)
Collingwood VIC 3066
Australia

Telephone: +61 3 9662 7666
Local call: 1300 788 000 (Australia only)
Fax: +61 3 9662 7555
Email: publishing.sales@csiro.au
Web site: www.publish.csiro.au

Front and back cover image
Satin Bowerbird (*Ptilonorhynchus violaceus*),
Jamieson, Victoria. Photo by John Manger.

Set in Adobe Minion 10/12 and Myriad MM
Cover and text design by James Kelly
Typeset by Desktop Concepts Pty Ltd, Melbourne
Printed in Australia by Ligare

Foreword

It is 13 years since Les Christidis and Walter Boles published their first definitive list of Australian birds. That list has been a backbone for much subsequent science and conservation. In that time, however, taxonomy has become ever more sophisticated. Our understanding of the avian genome is expanding, so too is our appreciation of the evolutionary relationships of birds at many different levels in the taxonomic hierarchy. So Les and Walter have taken stock of the changes, reviewed progress and set a new benchmark.

In this thorough revision of their original work they have again applied consistent taxonomic criteria across the entire Australian avifauna, based on the interpretation of information accumulated since their first list. They have taken a conservative approach. As with the first volume they have disciplined themselves to consider only refereed publications. Where they think there is doubt, they have opted for caution. They have also foreshadowed many areas where further change is likely, where current arrangements are unsatisfactory and require revision. However, until the research has been both performed and published, changes to the current system cannot be justified. Inevitably such a conservative approach requires compromise. Some will be alarmed by the changes adopted, others will feel the revision has not gone far enough. However, taxonomies will always be debated, and only scholarship, technology and ongoing research in museums and in the field will resolve arguments.

A standard list such as this one has many uses. A sound taxonomy underpins conservation, is pivotal to understanding ecology, provides guidance for birdwatchers, anchors projects like the *Australian Bird Atlas* and is one of the foundations of work to identify the internationally Important Bird Areas in the country. While this list will undoubtedly require ongoing revision, it provides the bedrock on which further revisions will be built. Australian ornithology is fortunate to have such competent and dedicated taxonomists to maintain such a solid foundation.

Alison Russell-French
President
Birds Australia

Stephen Garnett
Professor of Tropical Knowledge
Charles Darwin University

Contents

Acknowledgements

A work such as this has many opportunities to stray into its own unrestrained trajectory. We have been fortunate for colleagues who provided invaluable help at keeping us on, or at least close to, a reasonably coherent product. Throughout the compilation of this list and its supporting text, we have been assisted at many stages by a range of people, often contributing to more than one aspect. A number have willingly commented on the manuscript at various drafts as either referees or informal reviewers, and their input has been invaluable in avoiding many misinterpretations, oversights and an assortment of embarrassingly careless errors. Many of the points of classification raised in the text triggered ongoing interchanges with these readers. Such discussions regarding specific and generic limits, and higher level classifications, have helped focus our thinking and review our decisions, sometimes leading to major modifications in those incorporated in the work. It is not surprising that not everyone agrees with all the decisions taken here. Various colleagues have generously provided us with information from sources not otherwise available to us or that were in press, as well as answering queries and clarifying aspects about which we had questions. The task of keeping up to date with new species records for Australia and its territories, and determining which of these should be included here, was reliant on a number of observers who shared their opinions with us, and on the Rarities Appraisal Committee, which kept us constantly updated on its deliberations. The subject of English names always provokes a diversity of often strong opinions. We are grateful for our interactions with the Birds Australia English Names Committee, whose members responded to our questions and proposals and made recommendations where new or existing names required consideration in light of taxonomic changes. Our editors ensured that we remained focussed on completing this job, and rigorously edited the text, identifying inconsistencies and ambiguities, and providing utmost care in seeing this project through to completion. We are very grateful to all our colleagues who have helped us out. Any errors of fact or interpretation remaining are, of course, the responsibility of the authors. We are grateful to the Australian Museum and Museum Victoria for providing the facilities in order to undertake this project. For assistance, discussion, information and guidance, our thanks go to (in alphabetical order) Nick Alexander, Simon Bennett, John Blyth, Rauri Bowie, Allan Burbidge, Mike Carter, Briana Elwood, Stephen Garnett, Anina Hainsworth, David James, Ron Johnstone, Leoné Lemmer, Leo Joseph, Andrew Ley, Wayne Longmore, Richard Loyn, Ian McAllan, Alan McBride, Kevin McCracken, Peter Menkhorst, Janette Norman, Rory O'Brien, Tony Palliser, Frank Rheindt, Libby Robin, Danny Rogers, Paul Scofield, Fiona Simpson, Peter Storer, Mike Weston, John Woinarski, Trevor Worthy.

Les Christidis
Walter Boles

About the authors

After completing a Bachelor of Science (Honours) degree from the University of Melbourne in 1980, Les Christidis undertook a PhD at the Australian National University where he focused on the evolutionary genetics of Australian finches. He was one of the first to apply genetic-based approaches to understanding the evolution of Australian birds. He went on to conduct research on the origins of Australia's songbirds, first as a CSIRO Post-doctoral Fellow and then as the recipient of Queen Elizabeth II Fellowship. During this period he was able to demonstrate that Australia was the centre of origin for the world's 4500 songbirds. Before this, it was thought that the northern hemisphere was the original source for songbirds. From 1987 to 1996, Les was the Senior Curator of Ornithology at Museum Victoria and in 1997 he became the Science Program Director and later Head of the Department of Sciences. During this time (1997–2004) he led teams that produced major exhibitions for Melbourne Museum and the development of Australia's first Digital Planetarium at ScienceWorks. Les Christidis has published over 90 scientific papers including *The Taxonomy and Species of Birds of Australia and its Territories*. Apart from the systematics and evolutionary genetics of birds, he has also published articles on the evolution of bats, marsupials and marine bryozoans. Les Christidis has supervised numerous Honours and PhD students and is an Associate Professor in Genetics at the University of Melbourne. He sits on several national and international committees including the Global Biodiversity Information Facility Science Subcommittee. In 2005 he was a recipient of the inaugural *W. Roy Wheeler Medallion for Excellence in Field Ornithology*. Since 2004, he has been Head of the Division of Research and Collections, and Assistant Director of the Australian Museum in Sydney.

Walter Boles graduated from Emporia State University in Kansas in 1974 and soon afterwards joined the Australian Museum, where he is now a Scientific Officer in Ornithology and Collection Manager of Birds. Among his research interests are the evolution, systematic and biogeography of Australian birds, particularly songbirds. This is not restricted to living birds – in 2000 he was awarded his PhD from the University of New South Wales of his study on the Tertiary avifauna of Australia. Walter has written over 100 papers and articles on Australian birds, as well as family accounts for the *Handbook of Birds of the World* and several books, including the National Photographic Index of Australian Wildlife's *The Robins and Flycatchers of Australia*. In addition to being a co-describer of the Eungella Honeyeater in 1983, Walter has named several other new genera and species of living and fossil Australian birds, and published articles on the earliest known fossil songbirds in the world. In 1990, he was part of a team that discovered a dead Night Parrot – the first positive record in more than 70 years. Walter is an Australian representative on the International Ornithological Committee and is on the executive council of the Society of Avian Paleontology and Evolution. He has also been an honorary Teaching Associate or Adjunct Lecturer at University of Sydney, University of New South Wales and Charles Sturt University. In 2000, he was selected by Emporia State University as a Distinguished Alumni.

Introduction

The predecessor of this publication (Christidis and Boles 1994) is well out of date. An update was originally planned to appear by 1998 at the latest. For a variety of reasons, this did not happen and, since then, a plethora of studies has been published that have resulted in taxonomic changes affecting Australian birds. Thus the present publication is timely, if not well overdue. Its aims are similar to those of the 1994 compilation:

1. Present an updated taxonomic list, using Christidis and Boles (1994) as the starting point into which subsequent taxonomic revisions are incorporated
2. Provide explanations for taxonomic changes in the literature and for those adopted here, including the citations for such work
3. Incorporate new species described and new records of vagrants to Australia since 1994, based on the recommendations of the Birds Australia's Rarities Committee (BARC) or that are represented by specimen records. BARC is the successor to the Royal Australasian Ornithologist Union's Rarities Appraisal Committee – RAC – which was the rarities committee operating at the time of Christidis and Boles (1994)
4. Maintain the geographical coverage to include the island territories of Australia. Those incorporated here are Christmas Island, Cocos (Keeling) Islands, Heard Island, Lord Howe Island, Macquarie Island, Norfolk Island and the islands of Torres Strait, to which has been added Ashmore Reef, owing to the number of vagrant species that have recently been reported from this location. Also included are vagrants from the Australian Antarctic Territory not recorded elsewhere in Australian territory.

This species list includes all extant and recently extinct (post-1800) native species, including accepted vagrants (see below), and introduced species that have become established and continue to survive in the wild. Accepted vagrants are those for which observational records have been reviewed and accepted by BARC or are represented by a specimen record. Introduced species accepted into the list are those whose populations are naturally self-sustaining, without the need for additional releases or escapees to remain viable. The supplementary list includes introduced species that were established, but have now been extirpated, those species in the literature that are now not accepted and reports of vagrant species still under review by BARC at the time of writing.

Christidis and Boles (1994) dealt in an inconsistent manner with some Christmas and Cocos (Keeling) Islands species for which the specimens on which the records are based have not been located. For example, based on specimen records cited by Gibson-Hill (1950), *Nycticorax nycticorax* (Black-crowned Night-Heron) was placed on the main list as a vagrant, but *Bubo* (*Ketupa*) *ketupu* (Buffy Fish-Owl) was relegated to the supplementary list. All such species are now included on the main list.

The status of ship-assisted species has been the subject of ongoing debate, particularly regarding how such records should be treated in lists such as this. In the previous publication (Christidis and Boles 1994), species such as *Corvus splendens* (House Crow), which were known to have arrived in Australia in this manner, were placed on the supplementary list. Ship-assistance is now accepted by the British Ornithologists' Union (BOU 2005) as a normal means of dispersal under some circumstances and so does not automatically disqualify a record from being accepted, so long as the survival of the bird in question was not dependent on direct human assistance (e.g. provision of food or water) and where the species 'might be expected to arrive in Britain naturally and without ship assistance given favourable circumstances.' In Australia, that latter condition is unlikely to be met in most instances. Nonetheless, it is not the role of this list to adjudicate whether or not birds are ship-assisted. Some vagrant species that have been listed previously probably arrived this way, but there is no way to ascertain this. Where it is known that the occurrence of a species in Australia is due to ship-assistance, it is noted in the text but the species is included on the main list.

Most of this compilation was completed by 31 December 2006. However, several papers that were available while 'in press' at that time, or that were published early in 2007 before final submission of this manuscript, were incorporated.

Taxonomic decisions

This list is not innovative in the sense that it does not incorporate novel taxonomic changes of the authors that are not based on published studies – instead being reliant on data and arguments previously presented in the scientific literature. Any modifications to the baseline list (in this case, Christidis and Boles 1994) are based, as much as possible, on rigorous taxonomic revisions providing explicitly stated characters and detailed analyses. The data should be presented in a manner that permits evaluation by others; that is, the reasons for which an action was taken should be transparent. It is even more desirable (although rarely achieved) that the published conclusions have been independently corroborated by another study.

Another requirement is that these studies must be 'available' sources, such as published works, including papers accepted for publication, as well as in graduate and post-graduate theses. A consequence of this restriction means that conclusions of works that are in progress, but have not yet been published, have not been incorporated. Nonetheless, in some cases, unpublished works have been used indirectly to choose between alternative treatments already published in the literature.

Similarly, abstracts of papers delivered at meetings are not regarded as published and thus are not accepted as the sole bases on which to make taxonomic changes where additional supporting evidence is not available from published studies. Nonetheless, abstracts may assist when deciding between alternative published treatments.

Although innovative taxonomic changes have been avoided, there is some degree of interpretation. A number of authors have presented data (either in tabular form or graphically) that clearly indicate relationships that affect Australian taxa, but have not themselves made formal taxonomic recommendations. Here, such results have been interpreted and an assessment made of how these should be best reflected in the list.

There are some taxa for which none of the current alternative proposals have had strong supporting evidence presented. In most of such instances, current usage in Australian literature has been maintained for the sake of consistency (e.g. *Himantopus himantopus* vs *H. leucocephalus*). For vagrants to Australia, the prevailing taxonomic treatments from the areas of their normal distributions have been adopted unless specific revisions of the relevant group have been made.

General works or taxonomic lists frequently contain variations from standard usage – some that are based on published work, but some of which are unsubstantiated. Most notable are the 16 volumes of Peters' *Check-list of Birds of the World* (1931–1987), *Distribution and Taxonomy of Birds of the World* (Sibley and Monroe 1990), *The Howard and Moore Complete Checklist of Birds of the World* (Dickinson 2003) and *The Clements Checklist of Birds of the World* (2000). Although these are probably the most widely used world taxonomies, much of their content is not based on published studies, and thus has no special standing under the criteria adopted here. Where these sources are at variance with the present list, the differences are discussed but not followed. (A new edition of Clements was expected in 2006, so it was originally decided to await its appearance rather than refer to the 2000 edition; unfortunately, delays to the publication resulted in it being released too late to be incorporated here.) Treatments in relevant regional faunal lists and checklists are also discussed and compared with the taxonomy followed here.

Poorly resolved taxonomic areas are highlighted, as are suggestions that have merit but await rigorous assessment and formal proposals. Hopefully, by having these flagged, workers will be encouraged to adopt them as worthy subjects for further research.

As Helbig *et al.* (2002) rightly emphasised, taxonomic decisions are scientific hypotheses regarding the evolutionary status of the organisms under consideration. There is no single correct list – with the levels of understanding varying between groups (sometimes markedly). This list must be treated as a provisional classification. It should be expected – indeed, hoped – that these will be revised, where appropriate, as new studies become available.

The most influential body of work on avian systematics in the past two decades has been the research by C.G. Sibley and his collaborators (Sibley *et al.* 1988; Sibley and Ahlquist 1990; Sibley and Monroe 1990, 1993) using DNA–DNA hybridisation applied to wide sampling of avian taxa. Despite criticism of the techniques and analytical methods (see, for example, Cracraft 1987, 1992a; Houde 1987; Lanyon 1992; Mindell 1992; Peterson 1992; Siegel-Causey 1992; Harshman 1994; Mayr and Bock 1994), many of the higher-level relationships revealed by these studies have stood up to subsequent testing by other methods, but others have not. These authors associated a number of higher-level taxa in arrangements that were novel. Some of these original groupings resulted from the methodologically undesirable application of cladistic classification protocols to phenetically derived distance measures between taxa. An outcome of this approach was the recognition of some of these assemblages at unconventional taxonomic ranks. The resulting classification was explicitly outlined in Sibley *et al.* (1988) and Sibley and Monroe (1990). For example, in their Order Ciconiiformes, they included the 'traditional' Charadriiformes, Falconiformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Sphenisciformes, Gaviiformes and Procellariiformes. Since Sibley and Monroe (1990) was published, only a few authors have incorporated the most radical aspects of this organisation. In many cases, the DNA–DNA hybridisation studies are useful for demonstrating what is related to what, but not necessarily at what taxonomic level. In the present list, most of the conventional groupings have been retained and the classifications of Sibley *et al.* (1988) and Sibley and Monroe (1990) are not mentioned except where relevant sections have been corroborated by more recent studies.

The rate of appearance of molecular studies has increased considerably since 1994. These have included studies using new genes and/or with greater coverage of taxa, and have ranged from investigations into diversification of major avian lineages to those concerned with differences within a species. Some of these papers have appeared in the dedicated professional ornithological journals, but increasing numbers have appeared in more specifically molecularly oriented publications – *Molecular Phylogenetics and Evolution* has been perhaps the largest contributor. Another primarily molecular-based work is the Aves chapter in *The Tree of Life* (Cracraft *et al.* 2004). This chapter reviewed previous work and synthesised it with several unpublished studies based on variety of mitochondrial and nuclear sequences (*c-myc*, RAG-1, RAG-2) and investigated relationships among neornithine families within the non-passerines (particularly 'waterbirds') and among the passerines. Although it would be desirable to have these investigations published in detail, the phylogenetic trees presented and overall conclusions are robust. (Molecular-based studies may be daunting to readers with limited background in this area. Maclean *et al.* (2005) provides a good introduction to DNA-based systematics in birds.)

In contrast to the previous molecular-based studies, Livezey and Zusi (2007) presented a morphologically based work using more than 2900 characters (described in Livezey and Zusi 2006) for 150 taxa, representing all families of non-passerines and major groups of passerines. Those authors described it as a work in progress, with the goals of providing a baseline estimate of higher-level avian relationships and serving as a framework for studies at finer taxonomic resolutions. It is also planned to incorporate their dataset with those from molecular-based studies as part of a larger scale examination of avian phylogeny. On the basis of cladistic analyses of these characters, Livezey and Zusi (2007) presented a tentative revised classification of living birds. Sections of their classification are at odds with more recent schemes. For example, they associated as sister taxa the Podicipediformes with the Gaviiformes and the Falconiformes with the Strigiformes, retained the Phoenicopteridae in the Ciconiiformes, and split the Rallidae and Heliornithidae from the Gruiformes into the order Ralliformes.

Owing to the breadth of this work and the lateness that it was received, its conclusions are given a more cursory treatment than warranted. Here the major findings of Livezey and Zusi (2006, 2007) pertinent to Australia are summarised, and noted in the systematic accounts where relevant.

Among the other important references dealing directly or peripherally with the taxonomy of Australian birds that have been published since 1994 are two major systematic references concerned specifically with Australian taxa. Schodde and Mason (1997) produced the first of four planned volumes of the *Zoological Catalogue of Australia* dealing with birds. It dealt with the 'higher' non-passerines from the Columbidae to the Coraciiformes and presented extensively detailed taxonomic synonymies. The Australian passerines were extensively covered in *The Directory of Australian Birds. Passerines* (Schodde and Mason 1999). The authors made a number of significant taxonomic changes, from the subspecies to subfamily levels. While both works were based on extensive examinations of large numbers of specimens, much of the data were not presented, so it is not easy to assess the decisions.

Several books addressed birds on a world scale, thus including Australia. A revised and updated edition of the world list in *The Howard and Moore Complete Checklist of Birds of the World* (Dickinson 2003) was published, which provided helpful summaries and references, although it included some original taxonomic arrangements that require further documentation. The series *Handbook of Birds of the World* (del Hoyo *et al.* 1992–ongoing) presents some novel taxonomic approaches for some families and variances from standard arrangements are usually addressed in the family text or species accounts. These books are cited where relevant, although the decisions are often not based on published data. Several publishers, notably Oxford University Press and Helm (incorporating Pica Press), embarked on a series of books devoted to major families or groups of families. Some of these works incorporate detailed taxonomic reviews, sometimes based on novel revisions carried out for the publication, while other books are more superficial in their approach to taxonomic review. The former are significant sources of information because their perspective encompasses all included taxa. Taxonomic limits and, particularly, sequences in the latter books have been frequently adopted despite the absence of in-depth revisionary work.

Ornithological societies in various countries have also produced species list particular to their needs and geographic coverage (e.g. American Ornithologists Union, British Ornithologists Union and Ornithological Society of New Zealand). The decisions made in those works that are also relevant to taxa occurring in Australia have been taken into consideration in an effort to maximise consistency in taxonomic treatments.

Of particular relevance to Australia is a list of living and recently extinct breeding birds of New Zealand (Holdaway *et al.* 2001). This also included birds of Norfolk Island because it, like New Zealand, is located on the Norfolk Ridge. The authors adopted a phylogenetic species concept (PSC) (see below), leading them to consider most closely related Australian and New Zealand populations as separate species. Furthermore, they also specifically separated a number of birds among the North, South and Chatham Islands. This extensive application of the PSC has not been adopted in the present list (see discussion below).

An extensive review of the birds of Lord Howe Island was compiled by McAllan *et al.* (2004) and its conclusions serve as the primary basis for treatment of records from that island. The compilations of Johnstone and Darnell (2004a) and Johnstone and Darnell (2004b) are major sources for birds of Christmas Island and Cocos (Keeling) Islands, respectively.

Ideally, regional handbooks should use well-documented taxonomic baselines. However, this has not always been the case and, in some instances, the taxonomy adopted in such texts has been taken up by subsequent works, without necessarily having had supporting evidence presented elsewhere. These instances are noted, but ordinarily such decisions warrant limited discussion. Rasmussen and Anderton (2005) presented useful comments with respect to some species and their relatives occurring in Australia and southern Asia – many based on vocalisations as well as morphology. Changes suggested in that work have not been incorporated here unless corroborated by other work. Nevertheless, many will probably prove to be valid with future investigations. These are noted in the species text and invite further work.

Some emendations to scientific names result from application of the correct gender of the genera, as identified by David and Gosselin (2002a,b).

For each scientific name in this list, the author and date of description are given, although the correct dates and author citation for some species of Australian birds remain unresolved (e.g. McAllan and Bruce 1988; Bruce and McAllan 1990). For the purposes of this list, those used in Dickinson (2003) are followed, with minor exceptions. One was the attribution of Shaw as author for birds described in *Journal of a Voyage to New South Wales* by John White (1790). There is far from agreement on this issue; see conflicting views in Hindwood (1969), Mees (1969a), Condon (1975), Schodde (1975), Schodde and Mason (1980), McAllan and Bruce (1988), Sibley and Monroe (1990), among others. Similarly, Shaw, rather than Shaw and Nodder, was treated as the author for birds described in *The Naturalist's Miscellany* (Shaw 1789–1813) (Schodde 1975; *contra* Sibley and Monroe 1990).

After Dickinson (2003), the date of C.L. Bonaparte's *Conspectus Generum Avium* is accepted as 1850, rather than 1851. Christidis and Boles (1994) used both years inconsistently for this reference.

Christidis and Boles (1994) gave the year of publication for J. Latham's *Supplementum Indicis Ornithologici* as 1801. Browning and Monroe (1991) argued that this should correctly be cited as 1802. This was accepted by AOU (1998), Schodde and Mason (1999) and Dickinson (2003), although the last noted that there were counter-arguments that have not yet been published. An application has been made to the Zoological Commission on Zoological Nomenclature to resolve this issue (Schodde *et al.* submitted).

The use of 1802 as the publication year alone, without a specified month, has the potential to require some name changes among Australian birds. If no more precise determination of the date can be made, then, as pointed out by McAllan (2007), following Browning and Monroe (1991), the publication date must be treated as 31 December 1802.

Latham introduced the scientific name *Menura novaehollandiae* for the Superb Lyrebird in *Supplementum Indicis Ornithologici*. Based on an assumed 1801 publication date for that work, this name has been used by recent authors. However, if the publication date becomes 31 December 1802, then another name for this species, *Menura superba* Davies, published earlier in 1802 (5 June), becomes the senior name. Schodde and Mason (1999) advocated that *M. superba* should be suppressed by the International Commission on Zoological Nomenclature as an unused senior synonym. McAllan (2007) demonstrated that it had been used by a range of authors in a number of publications over the past 100 years and so does not meet the criteria for suppression set out in the latest Code of Zoological Nomenclature (Article 23).

There are differences in the wording between the English and French versions of the Code that could affect how the evidence for the publication date is interpreted. Until the Commission makes a ruling, 1802 is used here as the year of this publication for *Supplementum Indicis Ornithologici*, but without implications about a more precise date within that year.

The use of a publication date of 1857, rather than 1858, for Gould's descriptions of *Psephotus chrysopterygius* and *Malurus coronatus* follows Bruce and McAllan (1990). For discussion on a proposal that these usages be suppressed, see Bruce and McAllan (1999, 2000), Olson (1998a) and Schodde and Bock (1997, 1998, 1999). For the ruling by the Commission rejecting this proposal, see ICZN (2003).

Species concepts

One of the major areas of current taxonomic debate centres on the definitions of species and subspecies in birds (e.g. Cracraft 1983, 1992b; McKitrick and Zink 1988; Amadon and Short 1992; Haffer 1992; Knox 1994; Zink and McKitrick 1995; Remsen 2005). Several species concepts were well reviewed by Helbig *et al.* (2002) and an easily accessible account of these was given by Maclean *et al.* (2005). The criteria used have varied from the more conventional plumage, morphology, proportions and aspects of breeding interactions to increased reliance on ecological traits, behaviour, vocalisations and genetic characters. Whichever species concept is adopted has major implications for species limits accepted in the Australian avifauna. The two major species concepts that have been employed in Australia are the Biological Species Concept and the Phylogenetic Species Concept. Other species concepts have been proposed but, thus far, have received limited application in ornithology. This does not mean that these ideas lack merit and, indeed, with further examination, they may be found to have benefits not present in the more common employed concepts.

The traditional Biological Species Concept (BSC), advocated by Mayr (1963, 1970) and long used in Australia, treats species as groups of interbreeding natural populations that are reproductively isolated from other such groups – thus placing a critical emphasis on the evolution of reproductive isolation, whether this was actually observed or subjectively assessed. Initially, it was considered that hybridisation by two taxa when in contact indicated that they represented a single species. This was subsequently modified to allow for the continuum of outcomes, some of which (e.g. stable hybrid zones with parental forms present) accepted maintenance of two species even when some interbreeding occurred (Short 1969; Mayr 1982). Thus it is possible to empirically apply the BSC to sympatric or parapatric populations. The most contentious aspect is BSC's application to allopatric populations where no interactions can occur and thus cannot be assessed. Under the BSC, species status can be bestowed to both actually and potentially interbreeding populations. The latter of these applies to allopatric forms and requires a subjective assessment of the populations' overall distinctiveness, or the extent of their differences (generally external) between them relative to those of accepted (i.e. sympatric) species, or both. Criteria used for such judgment include morphological, behavioural or vocal similarities – that is, a typological approach. Under the BSC, many Australian taxa were combined because there was evidence of hybridisation. However, the dynamics of the hybrid zone were only occasionally studied in detail and such examinations relied almost always on plumage and, occasionally, vocalisations.

Some authors have advocated replacing the Biological Species Concept with the Phylogenetic Species Concept (PSC) (e.g. Rosen 1979; Cracraft 1983; Donoghue 1985; McKitrick and Zink 1988; Zink and McKitrick 1995). This idea regards a species as the smallest cluster of individual organisms that is monophyletic and diagnosable from other such clusters by a unique combination of fixed character states. A major difference from the BSC is how hybridisation is treated. Reproductive isolation is usually ascertained by the ability or inability to hybridise. It has been pointed out that at some time before the populations in question diverged, they could have interbred and would be expected to have done so when in contact. The retention of such ability is thus an ancestral trait (plesiomorphy) that has not been lost in some populations and thus has limited value in assessing specific status. Molecular studies have demonstrated that hybridisation and gene flow across well differentiated vertebrate species boundaries are more common than previously thought (e.g. Zink 2002; Randler 2006). The PSC places little reliance on attributes of breeding, although the fact that two sympatric taxa do not hybridise is a sufficient criterion under this concept to assign specific status to each. Because the PSC is generally not concerned with interactions between populations, it has the advantage that allopatric and sympatric populations can be considered under the same criteria.

Like the BSC, the PSC has a strong subjective component when assessing which characters are diagnostically significant. Worries about potential proliferation of species have been expressed and, even with restraint, the increase in species numbers can be substantial. For example, Cracraft (1992) applied the PSC to the birds of paradise, with the number of recognised species going from about 40 to 90.

Some authors advocate eliminating subspecies and elevating to species rank all recognisable monophyletic units (Cracraft 1983, 1992b; McKitrick and Zink 1988; Zink 2004). Such an approach could simplify some taxonomic decisions, but renders the concept in an operational, not theoretical, sense comparable to the typological concept of 19th-century systematists (Haffer 1992). A consequence of this practice is the elevation of any population that can be diagnosed to species rank, although these may be at quite incomparable levels of genetic divergence (Haffer 1992; Penhallurick and Wink 2004).

Rather than treat all such cases as species, Schodde and Mason (1999) took an intermediate step by introducing a new category, the ultrataxon. This was defined as 'any terminal taxon at any taxonomic rank on the phylogenetic tree' and applied collectively in that work to monotypic species and subspecies as admitted under the BSC. (As such, it is equivalent to the phylogenetic species.) The purpose of the new term was to identify basal biodiversity units with a neutral term that avoids the sometimes negative views of the subspecific category and whose application does not require extensive re-delineation of species under the PSC or other alternative species concepts – the term 'species' unfortunately having been applied to these two very different ways of describing diversity.

Phylogenetic classification makes more biological sense in acknowledging that members of different lineages are at varying levels of evolutionary distinctiveness from other members, and thus do not fall naturally into the constraints of a rigid Linnean hierarchy. Nonetheless, there are many aspects where such circumscribed groups are useful, if not mandatory. Much of the audience for a list such as this does not have a taxonomic training and often wants precisely delimited groupings. This is the case with any use that cannot accommodate the subtleties or imprecision of a phylogenetic classification, such as legal documents and treaties (e.g. wildlife regulations, CITES) that also depend on these. The increase in the number of species would pose a number of administrative impediments (Schodde and Mason 1999).

It is now well established that levels of genetic and morphological differentiation are often not congruent. There is also undoubtedly a strong environmental influence on the phenotypic expression of genetic-based characters, the extent of which is poorly understood. Thus, the use of external characters might be expected in many cases not to provide an accurate reflection of species limits. Christidis and Boles (1994) observed that, as of that publication date, the understanding of the relationships of many Australian birds is based on morphology and, to a lesser extent, vocalisations and behaviour. They considered it premature to fully adopt a species concept based on phylogeny (i.e. PSC) when few robust phylogenies for Australian birds were available.

For the purposes of the British Ornithologists Union's checklist, Helbig *et al.* (2002) formulated a working species concept that emphasised monophyletic lineages that were diagnosable – it was considered that the lineages would retain their genetic and phenotypic integrity in the future. The authors addressed essential aspects of these requirements, noting that under the PSC there is no certainty that allopatric taxa treated as species would maintain integrity in future, if they were to subsequently come into contact, because genetic compatibility is not a consideration. The authors operational criteria for species level recognition were that individuals of at least one age or sex can be distinguished from some or all other taxa by at least one qualitative character or by complete discontinuity (no overlap) in one continuously varying character or, if there is overlap in these traits, by a combination of two to three functionally independent characters. Because it is expected that there will be differences between populations that have been allopatric for any extended period of time, species status of these should require diagnosability in several characters. Helbig *et al.* (2002) stressed that diagnosibility was at the taxon, not individual, level. They further remarked that, while many trivial but consistent differences between populations could be discovered, those employed for diagnosing taxa should be of adequate magnitude. (The meaning of 'adequate' is this case remains a largely subjective assessment by each worker.) Although these authors touched on the advent of molecular methods, the bulk of their discussion dealt with morphological assessments of species status, as did the criteria employed by Schodde and Mason (1999).

Watson (2005) noted that the range of criteria used for diagnosing species of birds was more restricted than those used for other vertebrate classes, with the result that a number of evolutionary distinct lineages are not recognised as distinct taxonomic units. He urged that other potentially available sources of information on species limits be adopted when making such assessments.

Some of the rapidly developing number of molecular methods, particularly DNA sequencing, have been used for some Australian species, but many have yet to receive any attention. Where such work has been carried out, it is possible to assess the magnitude of genetic divergence between putative species/subspecies and the extent of interbreeding, if any. Distances between populations can be used to gauge the appropriate taxonomic rank at which these populations should be recognised. Molecular comparisons, especially where this equates with genetic distances, have proved very useful, but are not the 'be all and end all' in all cases because reproductive isolation can occur over small distances in some groups relative to others.

In this work, decisions on whether or not to accept species circumscriptions different from those in Christidis and Boles (1994) are reliant on appropriate substantiation for such changes. The pertinent guidelines set out by Helbig *et al.* (2002) are applied when only morphological characters can be assessed, while assessments of published genetic data attempt to provide similar treatments to taxa with comparable levels of differentiation.

Ideally, published studies that are primarily non-taxonomic, but advocate some species changes, will have taken these, or similar, criteria into account, although these reasons are rarely explicitly stated. When considering these actions, a judgement has been made whether decisions on species-level taxonomy are justified by the available information presented.

Some arrangements are made in part for pragmatic reasons, usually reflecting a dearth of supporting information for any treatment. This is particularly pertinent for species-pairs in Australia–New Zealand and Australia–Timor. Equivalent taxonomic treatments have not always been applied. For example, the Australian Scarlet Robin (*Petroica boodang*) and New Zealand Tomtit (*P. macrocephala*) are maintained as separate species, whereas populations of the Grey Fantail (*Rhipidura fuliginosa*) on both sides of the Tasman were long treated as a single species (e.g. Watson and Mayr 1986; Christidis and Boles 1994), despite roughly equal levels of plumage distinction. Few (if any) genetic comparisons have been made between these members. Where several such pairs exist, but only one or a few have been examined genetically, then these genetic results could be used as gauges for the other pairs.

There is not, however, an *a priori* reason to believe that all such pairs have comparable genetic differentiation or that all colonisation events occurred at the same time. Pairs of species with congruent distributions can have markedly different levels of genetic divergence. The logrunners (*Orthonyx*) and sooty owls (*Tyto tenebricosa*/*multipunctata*) of Australia and New Guinea illustrate this point well (Norman *et al.* 2002), as do a number of taxa in North America (e.g. Zink *et al.* 1995, Klicka and Zink 1997). Here, each case is judged on its own merits, while recognising that such decisions are largely based on plumage alone and may prove poor reflections of levels of genetic differentiation.

When assessing molecular findings to determine species limits, a technique commonly employed is to compare levels of genetic differentiation (genetic distances). Species should reflect roughly equivalent distinction from each other when comparisons are made within a family or order. (This principle does not necessarily hold across inter-ordinal lines, as levels of genetic differentiation that are significant can differ between orders.) An example from among the mollymawk albatrosses is the Black-browed Albatross. The genetic distance between it and another conventional species, the Shy Albatross, is about twice that between the conventional subspecies within the Black-browed Albatross. By the criterion outlined above, the former, but not the latter, are recognised at specific level. There, of course, may be other biological evidence from the interactions of two taxa that indicate species status is warranted despite very low genetic distances (e.g. Grey and Chestnut Teal, which differ genetically by 0.09% using cytochrome-*b*).

It is also important to acknowledge that rates of genetic and phenotypic differentiation often do not progress in concert. Thus, a distinctive looking taxon may not show much genetic divergence from related forms, while the converse is also true.

The taxonomic level at which a population is recognised can have significant impact on the conservation status that is conferred to it and resources that flow on from this (Moritz 1994; Hazevoet 1995; Collar 1997; Schodde and Mason 1999; Garnett *et al.* 2003; Agapow *et al.* 2004; Mace 2004). A current topic of debate is whether some forms should be denoted as species to assist with conservation efforts, even when other evidence does not support such status. This practice is not adopted here.

Nor should the practicality of differentiating nominal forms in the field be a criterion on which to accept or reject specific rank. While this may present difficulties for human observers, it is not relevant to assessing the evolutionary history of a lineage. Watson (2005) addressed this problem in birds and made comparisons with other vertebrate classes.

Taxonomic methods

Expressing a three-dimensional, bush-like phylogenetic tree in a one-dimensional linear sequence is difficult, and is always subject to misinterpretation about the relationships between taxa implied by adjacent positions in the list. Where such trees have been published, their translation into a linear sequence is done by working up a branch to a node and then along one of its branches to the end before returning to the node and continuing up the other branch. This practice is employed for nodes at all positions on a tree. Note that when Species A and Species B are sister taxa, and these in turn are the sister taxa to Species C, then neither A nor B is closer to C. The branches at the node leading to A and B can be swivelled so that either member of the pair can sit next to C. In this sense, tree topologies are like mobiles. This principle is not restricted to species. The nodes leading to different taxa of whatever taxonomic rank can be rotated in this fashion.

As a result, there are several equally valid alternative translations of the same phylogenetic topology into a linear sequence. Some changes from the linear sequence in Christidis and Boles (1994) have been made to conform with common usage without changes to the phylogenies on which these changes are based. As long as the sequences do not conflict with an accurate reflection of the data, then this is not a problem.

Systematists vary in how they delimit categories above the species level. A generally acknowledged clade may be retained as a single unit at a certain taxonomic rank or subdivided, with two or more of its subunits recognised at that rank. In several instances, differences between the classifications used in Christidis and Boles (1994) and in Schodde and Mason (1999) reflect a disparity in how an obvious clade is subdivided. Examples include recognition of one or two families for the pardalotes and acanthizid warblers or one or more genera for the mud nest-building swallows and martins.

In the last two decades, avian classification has witnessed markedly different competing arrangements at the ordinal level. Perhaps for this reason, Dickinson (2003) did not use orders, restricting suprafamilial categories to family and subfamily. In the current list, mention is sometimes made in the text regarding suprafamilial or suprageneric rankings of taxa, but these categories have not been incorporated. Nor have allospecies and semispecies been used in the way discussed by Helbig *et al.* (2002). This does not mean that such categories are not beneficial in expressing the varying hierarchical levels that occur in the avian evolutionary tree.

English names

English names used in Christidis and Boles (1994) were originally based on the names included in the Recommended English Names for Australian Birds list of the Royal Australasian Ornithologists Union (RAOU 1978a). Deviations from that list were made on the basis of one of four criteria:

1. Changes to names of introduced or wide-ranging species to conform to current international usage (e.g. Salvin's Prion rather than Lesser Broad-billed Prion).
2. Changes as a result of changes in taxonomic status (e.g. Bassian and Russet-tailed Thrushes when separated from White's Thrush).
3. Changes to names used in the Recommended English Names list that were considered unpopular (e.g. Bush Stone-curlew rather than Bush Thick-knee), based on a survey of RAOU members, conducted via Wingspan (1993–4), to assess which names should be altered.
4. Inclusion of names of species new to the Australian list.

The present list uses the English names in Christidis and Boles (1994) as its starting point. Most instances involving wide-ranging species were addressed in that list, so are of limited concern here. There has been no equivalent effort to ascertain the feelings of the Australian ornithological community towards names since the RAOU's actions in 1993–4. The remaining two criteria for modifications are still relevant. Additions involving inclusions to the Australian list based on vagrant individuals since 1994 follow prevailing English names used in the area of species' normal distributions. Changes that are necessitated as a result of taxonomic changes are more problematic. Since 1994, a number of new names have been introduced or resurrected in response to the merging or splitting of species following systematic studies. The English Names Committee of Birds Australia reviewed the English names and made recommendations regarding those adopted here.

The use of English names for well-marked subspecies has been debated for some time, particularly when many of these were formerly considered to be species in their own right and were so listed by many field guides and other texts. The Recommended English Names list discouraged applying names to subspecies because this:

1. could not be done reliably in many areas, such as primary clines or secondary intergradation
2. would be an unnecessary encumbrance for non-taxonomic ornithological research and for foresters, faunal officers and ecologists
3. might encourage the less wary to attempt application of subspecific names to every bird.

By doing so, little information, other than distributional, would be lost.

In contrast to the situation in Europe, where subspecies are comparatively weakly differentiated, many subspecies in Australia are isolated, moderately to markedly differentiated morphologically and readily distinguishable in the field. The European situation is not relevant to Australia. Retention of distinctive forms at subspecific level should not be interpreted to mean that the trinomial scientific name (or English equivalent) should not be used where these birds can be confidently assigned in the field or hand. Where it is easy to identify subspecies – albatrosses are notable in this regard – it makes sense to do so. This more precise taxonomic resolution can be valuable for many other types of studies. With the increased emphasis on the subspecies as the basis for conservation (e.g. Garnett 1992; Schodde and Mason 1999, Garnett and Crowley 2000), this is a more important consideration than it was at the time of the English names list. Obviously, such instances must be chosen carefully, and subspecific identification should not be attempted where it cannot be done reliably.

Note that it is not deemed necessary to alter all group names to reflect these taxonomic changes. The Regent Honeyeater has been shown to be embedded within the wattlebirds, with the genus *Xanthomyza* being merged with *Anthochaera*. There seems no reason to make a parallel change in English name from Regent Honeyeater to Regent Wattlebird. English group names, such as wattlebird, do not have to have a one-to-one correspondence with generic names – that is not their role. Neither is it necessary to make every group name unique. Terms such as warbler, robin, wren and thrush are ecological groupings as much as taxonomic ones, and carry information about general appearance and behaviour of the birds – even between unrelated groups.

Species lists

Those species without a superscript in the main list below have been recorded from the Australian mainland, Tasmania or surrounding waters, either as breeding pairs or as regular migrants. Species that are mainly reported from, or occur only on, island territories are marked with the appropriate regional superscript (see abbreviations below). The superscripts V, I and E describe the status of the species (V = Vagrant, i.e. fewer than 10 records in total; I = Introduced; E = Extinct). A slash (/) signifies a combination; for example, C/V defines a species recorded from Christmas Island as a vagrant. If a species occurs on the mainland (not as a vagrant) and also on an island territory, it is not listed with a superscript. Consequently, this list cannot be used as a regional one for the island territories (see sources cited in Introduction). This key applies only to the main list below. In the body of this work, species included only on the supplementary list are noted with the superscript S.

A = Ashmore Reef
AAT = Australian Antarctic Territory
C = Christmas Island
CK = Cocos (Keeling) Islands
H = Heard Island
LH = Lord Howe Island
M = Macquarie Island
N = Norfolk Island
TS = Torres Strait Islands
S = Supplementary list (appears in body of text only)

Main species list

STRUTHIONIFORMES

Struthionidae

Struthio camelus	Linnaeus, 1758	Ostrich$^{I/E?}$

CASUARIIFORMES

Casuariidae

Casuarius casuarius	(Linnaeus, 1758)	Southern Cassowary
Dromaius novaehollandiae	(Latham, 1790)	Emu
Dromaius ater	Vieillot, 1817	King Island Emu^{E}
Dromaius baudinianus	S.A. Parker, 1984	Kangaroo Island Emu^{E}

GALLIFORMES

Megapodiidae

Alectura lathami	J.E. Gray, 1831	Australian Brush-turkey
Leipoa ocellata	Gould, 1840	Malleefowl
Megapodius reinwardt	Dumont, 1823	Orange-footed Scrubfowl

Numididae

Numida meleagris	(Linnaeus, 1758)	Helmeted Guineafowl^{I}

Odontophoridae

Callipepla californica	(Shaw, 1798)	California Quail^{I}

Phasianidae

Coturnix pectoralis	Gould, 1837	Stubble Quail
Coturnix ypsilophora	Bosc, 1792	Brown Quail
Excalfactoria chinensis	(Linnaeus, 1766)	King Quail
Pavo cristatus	Linnaeus, 1758	Indian Peafowl^{I}
Gallus gallus	(Linnaeus, 1758)	Red Junglefowl^{I}
Gallus varius	(Shaw, 1798)	Green Junglefowl$^{CK/I}$
Phasianus colchicus	Linnaeus, 1758	Common Pheasant^{I}
Meleagris gallopavo	Linnaeus, 1758	Wild Turkey^{I}

ANSERIFORMES

Anseranatidae

Anseranas semipalmata	(Latham, 1798)	Magpie Goose

Anatidae

Dendrocygna guttata	Schlegel, 1866	Spotted Whistling-Duck
Dendrocygna eytoni	(Eyton, 1838)	Plumed Whistling-Duck
Dendrocygna arcuata	(Horsfield, 1824)	Wandering Whistling-Duck

Biziura lobata	(Shaw, 1796)	Musk Duck
Stictonetta naevosa	(Gould, 1841)	Freckled Duck
Cereopsis novaehollandiae	Latham, 1802	Cape Barren Goose
Cygnus atratus	(Latham, 1790)	Black Swan
Cygnus olor	(J.F. Gmelin, 1789)	Mute Swan$^{\text{I}}$
Branta canadensis	Linnaeus, 1758	Canada Goose$^{\text{V/I}}$
Tadorna radjah	(Lesson, 1828)	Radjah Shelduck
Tadorna tadornoides	(Jardine & Selby, 1828)	Australian Shelduck
Tadorna variegata	(J.F. Gmelin, 1789)	Paradise Shelduck$^{\text{LH/V}}$
Chenonetta jubata	(Latham, 1802)	Australian Wood Duck
Malacorhynchus membranaceus	(Latham, 1802)	Pink-eared Duck
Nettapus coromandelianus	(J.F. Gmelin, 1789)	Cotton Pygmy-goose
Nettapus pulchellus	Gould, 1842	Green Pygmy-goose
Anas querquedula	Linnaeus, 1758	Garganey
Anas rhynchotis	Latham, 1802	Australasian Shoveler
Anas clypeata	Linnaeus, 1758	Northern Shoveler$^{\text{V}}$
Anas gracilis	Buller, 1869	Grey Teal
Anas castanea	(Eyton, 1838)	Chestnut Teal
Anas acuta	Linnaeus, 1758	Northern Pintail$^{\text{V}}$
Anas eatoni	(Sharpe, 1875)	Kerguelen Pintail$^{\text{AAT/V}}$
Anas platyrhynchos	Linnaeus, 1758	Northern Mallard$^{\text{I}}$
Anas superciliosa	J.F. Gmelin, 1789	Pacific Black Duck
Aythya australis	(Eyton, 1838)	Hardhead
Oxyura australis	Gould, 1837	Blue-billed Duck

PHAETHONTIFORMES

Phaethontidae

Phaethon rubricauda	Boddaert, 1783	Red-tailed Tropicbird
Phaethon lepturus	Daudin, 1802	White-tailed Tropicbird

PODICIPEDIFORMES

Podicipedidae

Tachybaptus novaehollandiae	(Stephens, 1826)	Australasian Grebe
Tachybaptus ruficollis	(Pallas, 1764)	Little Grebe$^{\text{V}}$
Poliocephalus poliocephalus	(Jardine & Selby, 1827)	Hoary-headed Grebe
Podiceps cristatus	(Linnaeus, 1758)	Great Crested Grebe

PHOENICOPTERIFORMES

Phoenicopteridae

Phoenicopterus ruber	Linnaeus, 1758	Greater Flamingo$^{\text{CK/V}}$

COLUMBIFORMES

Columbidae

Columba livia	J.F. Gmelin, 1789	Rock Dove^{I}
Columba vitiensis	Quoy & Gaimard, 1830	White-throated Pigeon$^{LH/E}$
Columba leucomela	Temminck, 1821	White-headed Pigeon
Streptopelia roseogrisea	(Linnaeus, 1758)	Barbary Dove^{I}
Streptopelia tranquebarica	(Hermann, 1804)	Red Collared Dove$^{C/V}$
Streptopelia senegalensis	(Linnaeus, 1766)	Laughing Dove^{I}
Streptopelia chinensis	(Scopoli, 1786)	Spotted Dove^{I}
Macropygia amboinensis	(Linnaeus, 1766)	Brown Cuckoo-Dove
Chalcophaps indica	(Linnaeus, 1758)	Emerald Dove
Phaps chalcoptera	(Latham, 1790)	Common Bronzewing
Phaps elegans	(Temminck, 1809)	Brush Bronzewing
Phaps histrionica	(Gould, 1841)	Flock Bronzewing
Ocyphaps lophotes	(Temminck, 1822)	Crested Pigeon
Geophaps plumifera	Gould, 1842	Spinifex Pigeon
Geophaps smithii	(Jardine & Selby, 1830)	Partridge Pigeon
Geophaps scripta	(Temminck, 1821)	Squatter Pigeon
Petrophassa albipennis	Gould, 1841	White-quilled Rock-Pigeon
Petrophassa rufipennis	Collett, 1898	Chestnut-quilled Rock-Pigeon
Geopelia cuneata	(Latham, 1802)	Diamond Dove
Geopelia striata	(Linnaeus, 1766)	Peaceful Dove
Geopelia humeralis	(Temminck, 1821)	Bar-shouldered Dove
Leucosarcia picata	(Latham, 1802)	Wonga Pigeon
Gallicolumba norfolciensis	(Latham, 1802)	Norfolk Island Ground-Dove$^{N/E}$
Ptilinopus cinctus	(Temminck, 1809)	Banded Fruit-Dove
Ptilinopus magnificus	(Temminck, 1821)	Wompoo Fruit-Dove
Ptilinopus superbus	(Temminck, 1809)	Superb Fruit-Dove
Ptilinopus regina	Swainson, 1825	Rose-crowned Fruit-Dove
Ptilinopus iozonus	(G.R. Gray, 1858)	Orange-bellied Fruit-Dove$^{TS/V}$
Ducula concinna	(Wallace, 1865)	Elegant Imperial-Pigeon^{V}
Ducula whartoni	(Sharpe, 1887)	Christmas Island Imperial-Pigeon^{C}
Ducula mullerii	(Temminck, 1835)	Collared Imperial-Pigeon$^{TS/V}$
Ducula bicolor	(Scopoli, 1786)	Pied Imperial-Pigeon
Lopholaimus antarcticus	(Shaw, 1793)	Topknot Pigeon
Hemiphaga novaeseelandiae	(J.F. Gmelin, 1789)	New Zealand Pigeon$^{N/E}$

CAPRIMULGIFORMES

Podargidae

Podargus strigoides	(Latham, 1802)	Tawny Frogmouth

Podargus papuensis	Quoy & Gaimard, 1830	Papuan Frogmouth
Podargus ocellatus	Quoy & Gaimard, 1830	Marbled Frogmouth

Eurostopodidae

Eurostopodus mystacalis	(Temminck, 1826)	White-throated Nightjar
Eurostopodus argus	(Hartert, 1892)	Spotted Nightjar

Caprimulgidae

Caprimulgus macrurus	Horsfield, 1821	Large-tailed Nightjar
Caprimulgus affinis	Horsfield, 1821	Savanna Nightjar$^{C/V}$
Caprimulgus indicus	Latham, 1790	Grey Nightjar$^{A/V}$

APODIFORMES

Aegothelidae

Aegotheles cristatus	(Shaw, 1790)	Australian Owlet-nightjar

Apodidae

Collocalia esculenta	(Linnaeus, 1758)	Glossy Swiftlet^{V}
Collocalia linchi	Horsfield & Moore, 1854	Linchi Swiftlet^{C}
Aerodramus terraereginae	(E.P. Ramsay, 1875)	Australian Swiftlet
Aerodramus vanikorensis	(Quoy & Gaimard, 1830)	Uniform Swiftlet^{V}
Hirundapus caudacutus	(Latham, 1802)	White-throated Needletail
Mearnsia novaeguineae	(D'Albertis & Salvadori, 1879)	Papuan Spine-tailed Swift$^{TS/V}$
Apus pacificus	(Latham, 1802)	Fork-tailed Swift
Apus affinis	(J.E. Gray, 1830)	House Swift^{V}

PROCELLARIFORMES

Hydrobatidae

Hydrobates monorhis	(Swinhoe, 1867)	Swinhoe's Storm-Petrel^{V}
Hydrobates leucorhoa	(Vieillot, 1818)	Leach's Storm-Petrel^{V}
Hydrobates tristrami	(Salvin, 1896)	Tristram's Storm-Petrel^{V}
Hydrobates matsudairae	(Kuroda, 1922)	Matsudaira's Storm-Petrel$^{V,C/V}$

Oceanitidae

Oceanites oceanicus	(Kuhl, 1820)	Wilson's Storm-Petrel
Garrodia nereis	(Gould, 1841)	Grey-backed Storm-Petrel
Pelagodroma marina	(Latham, 1790)	White-faced Storm-Petrel
Fregetta tropica	(Gould, 1844)	Black-bellied Storm-Petrel
Fregetta grallaria	(Vieillot, 1817)	White-bellied Storm-Petrel^{V,LH}

Diomedeidae

Diomedea exulans	Linnaeus, 1758	Wandering Albatross
Diomedea epomophora	Lesson, 1825	Royal Albatross

Phoebastria immutabilis	(Rothschild, 1893)	Laysan Albatross^{V}
Thalassarche melanophris	(Temminck, 1828)	Black-browed Albatross
Thalassarche cauta	(Gould, 1841)	Shy Albatross
Thalassarche chrysostoma	(J.R. Forster, 1785)	Grey-headed Albatross
Thalassarche chlororhynchos	(J.F. Gmelin, 1789)	Yellow-nosed Albatross
Thalassarche bulleri	(Rothschild, 1893)	Buller's Albatross
Phoebetria fusca	(Hilsenberg, 1822)	Sooty Albatross
Phoebetria palpebrata	(J.R. Forster, 1785)	Light-mantled Sooty Albatross

Procellariidae

Macronectes giganteus	(J.F. Gmelin, 1789)	Southern Giant-Petrel
Macronectes halli	Mathews, 1912	Northern Giant-Petrel
Fulmarus glacialoides	(A. Smith, 1840)	Southern Fulmar
Thalassoica antarctica	(J.F. Gmelin, 1789)	Antarctic Petrel
Daption capense	(Linnaeus, 1758)	Cape Petrel
Pagodroma nivea	(G. Forster, 1777)	Snow Petrel$^{H/V}$
Halobaena caerulea	(J.F. Gmelin, 1789)	Blue Petrel
Pachyptila vittata	(Forster, 1777)	Broad-billed Prion
Pachyptila salvini	(Mathews, 1912)	Salvin's Prion
Pachyptila desolata	(J.F. Gmelin, 1789)	Antarctic Prion
Pachyptila belcheri	(Mathews, 1912)	Slender-billed Prion
Pachyptila turtur	(Kuhl, 1820)	Fairy Prion
Pachyptila crassirostris	(Mathews, 1912)	Fulmar Prion^{V,H}
Procellaria aequinoctialis	Linnaeus, 1758	White-chinned Petrel
Procellaria westlandica	Falla, 1946	Westland Petrel^{V}
Procellaria parkinsoni	G.R.Gray, 1862	Black Petrel
Procellaria cinerea	J.F. Gmelin, 1789	Grey Petrel
Bulweria bulwerii	(Jardine & Selby, 1828)	Bulwer's Petrel^{V}
Bulweria fallax	Jouanin, 1955	Jouanin's Petrel^{V}
Ardenna pacifica	(J.F. Gmelin, 1789)	Wedge-tailed Shearwater
Ardenna bulleri	(Salvin, 1888)	Buller's Shearwater
Ardenna carneipes	(Gould, 1844)	Flesh-footed Shearwater
Ardenna creatopus	(Coues, 1864)	Pink-footed Shearwater^{V}
Ardenna gravis	(O'Reilly, 1818)	Great Shearwater^{V}
Ardenna grisea	(J.F. Gmelin, 1789)	Sooty Shearwater
Ardenna tenuirostris	(Temminck, 1835)	Short-tailed Shearwater
Calonectris leucomelas	(Temminck, 1835)	Streaked Shearwater
Puffinus puffinus	(Brünnich, 1764)	Manx Shearwater^{V}
Puffinus newelli	Henahaw, 1900	Newell's Shearwater^{V}
Puffinus gavia	(J.R. Forster, 1844)	Fluttering Shearwater

Puffinus huttoni	Mathews, 1912	Hutton's Shearwater
Puffinus lherminieri	Lesson, 1839	Audubon's Shearwater^{V}
Puffinus assimilis	Gould, 1838	Little Shearwater
Pseudobulweria rostrata	(Peale, 1848)	Tahiti Petrel
Lugensa brevirostris	(Lesson, 1831)	Kerguelen Petrel
Pterodroma baraui	(Jouanin, 1964)	Barau's Petrel^{V}
Pterodroma externa	(Salvin, 1875)	Juan Fernandez Petrel^{V}
Pterodroma neglecta	(Schlegel, 1863)	Kermadec Petrel^{V,LH,N}
Pterodroma heraldica	(Salvin, 1888)	Herald Petrel
Pterodroma mollis	(Gould, 1844)	Soft-plumaged Petrel
Pterodroma lessonii	(Garnot, 1826)	White-headed Petrel
Pterodroma macroptera	(A. Smith, 1840)	Great-winged Petrel
Pterodroma solandri	(Gould, 1844)	Providence Petrel
Pterodroma inexpectata	(J.R. Forster, 1844)	Mottled Petrel
Pterodroma leucoptera	(Gould, 1844)	Gould's Petrel
Pterodroma cookii	(G.R. Gray, 1843)	Cook's Petrel^{V}
Pterodroma cervicalis	(Salvin, 1891)	White-necked Petrel^{V,N}
Pterodroma occulta	Imber & Tennyson, 2001	Vanuatu Petrel^{V}
Pterodroma nigripennis	(Rothschild, 1893)	Black-winged Petrel
Pterodroma incerta	(Schlegel, 1863)	Atlantic Petrel^{V}
Pelecanoides urinatrix	(J.F. Gmelin, 1789)	Common Diving-Petrel
Pelecanoides georgicus	Murphy & Harper, 1916	South Georgian Diving-Petrel^{V,M,H}

SPHENISCIFORMES

Spheniscidae

Aptenodytes patagonicus	J.F. Miller, 1778	King Penguin^{V,M,H}
Aptenodytes forsteri	Gray, 1844	Emperor Penguin$^{H/V}$
Pygoscelis papua	(J.R. Forster, 1781)	Gentoo Penguin^{V,M,H}
Pygoscelis adeliae	(Hombron & Jacquinot, 1841)	Adelie Penguin$^{M/V,H/V}$
Pygoscelis antarcticus	(J.R. Forster, 1781)	Chinstrap Penguin$^{V,H/V}$
Eudyptes chrysocome	(J.R. Forster, 1781)	Rockhopper Penguin^{V,M,H}
Eudyptes pachyrhynchus	G.R. Gray, 1845	Fiordland Penguin
Eudyptes sclateri	Buller, 1888	Erect-crested Penguin^{V}
Eudyptes chrysolophus	(Brandt, 1837)	Macaroni Penguin^{V,M,H}
Eudyptula minor	(J.R. Forster, 1781)	Little Penguin
Spheniscus magellanicus	(J.R. Forster, 1781)	Magellanic Penguin^{V}

PHALACROCORACIFORMES

Fregatidae

Fregata ariel	(G.R. Gray, 1845)	Lesser Frigatebird

Fregata minor	(J.F. Gmelin, 1789)	Great Frigatebird
Fregata andrewsi	Mathews, 1914	Christmas Island Frigatebird$^{V,C,CK/V}$
Sulidae		
Papasula abbotti	(Ridgway, 1893)	Abbott's Booby$^{V,C,A/V}$
Morus capensis	(Lichtenstein, 1823)	Cape Gannet^{V}
Morus serrator	(G.R. Gray, 1843)	Australasian Gannet
Sula dactylatra	Lesson, 1831	Masked Booby
Sula sula	(Linnaeus, 1766)	Red-footed Booby
Sula leucogaster	(Boddaert, 1783)	Brown Booby
Anhingidae		
Anhinga novaehollandiae	(Gould, 1847)	Australasian Darter
Phalacrocoracidae		
Microcarbo melanoleucos	(Vieillot, 1817)	Little Pied Cormorant
Phalacrocorax carbo	(Linnaeus, 1758)	Great Cormorant
Phalacrocorax sulcirostris	(J.F. Brandt, 1837)	Little Black Cormorant
Phalacrocorax varius	(J.F. Gmelin, 1789)	Pied Cormorant
Phalacrocorax fuscescens	(Vieillot, 1817)	Black-faced Cormorant
Leucocarbo atriceps	P.P. King, 1828	Imperial Shag^{M,H}
Leucocarbo verrucosus	(Cabanis, 1875)	Kerguelen Shag^{V}

CICONIIFORMES

Pelecanidae		
Pelecanus conspicillatus	Temminck, 1824	Australian Pelican
Ciconiidae		
Ephippiorhynchus asiaticus	(Latham, 1790)	Black-necked Stork
Ardeidae		
Botaurus poiciloptilus	(Wagler, 1827)	Australasian Bittern
Ixobrychus dubius	Mathews 1912	Australian Little Bittern
Ixobrychus sinensis	(J.F. Gmelin, 1789)	Yellow Bittern$^{V,C/V}$
Ixobrychus eurhythmus	(Swinhoe, 1873)	Schrenk's Bittern$^{C/V}$
Ixobrychus cinnamomeus	(J.F. Gmelin, 1789)	Cinnamon Bittern$^{C/V}$
Ixobrychus flavicollis	(Latham, 1790)	Black Bittern
Ardea cinerea	Linnaeus, 1758	Grey Heron^{V}
Ardea pacifica	Latham, 1802	White-necked Heron
Ardea modesta	J.E. Gray, 1831	Eastern Great Egret
Ardea intermedia	Wagler, 1829	Intermediate Egret
Ardea sumatrana	Raffles, 1822	Great-billed Heron
Ardea ibis	Linnaeus, 1758	Cattle Egret
Butorides striata	(Linnaeus, 1758)	Striated Heron

Ardeola bacchus	(Bonaparte, 1855)	Chinese Pond Heron$^{CK/V}$
Ardeola speciosa	(Horsfield, 1821)	Javan Pond Heron^{V}
Egretta picata	(Gould, 1845)	Pied Heron
Egretta novaehollandiae	(Latham, 1790)	White-faced Heron
Egretta garzetta	(Linnaeus, 1766)	Little Egret
Egretta sacra	(J.F. Gmelin, 1789)	Eastern Reef Egret
Nycticorax nycticorax	(Linnaeus, 1758)	Black-crowned Night-Heron$^{CK/V}$
Nycticorax caledonicus	(J.F. Gmelin, 1789)	Nankeen Night-Heron
Gorsachius melanolophus	(Raffles, 1822)	Malayan Night-Heron$^{C/V}$

Threskiornithidae

Plegadis falcinellus	(Linnaeus, 1766)	Glossy Ibis
Threskiornis molucca	(Cuvier, 1829)	Australian White Ibis
Threskiornis spinicollis	(Jameson, 1835)	Straw-necked Ibis
Platalea regia	Gould, 1838	Royal Spoonbill
Platalea flavipes	Gould, 1838	Yellow-billed Spoonbill

ACCIPITRIFORMES

Accipitridae

Pandion cristatus	(Vieillot, 1816)	Eastern Osprey
Elanus axillaris	(Latham, 1802)	Black-shouldered Kite
Elanus scriptus	Gould, 1842	Letter-winged Kite
Lophoictinia isura	(Gould, 1838)	Square-tailed Kite
Hamirostra melanosternon	(Gould, 1841)	Black-breasted Buzzard
Pernis ptilorynchus	(Temminck, 1821)	Oriental Honey-buzzard$^{V,C/V}$
Aviceda subcristata	(Gould, 1838)	Pacific Baza
Haliaeetus leucogaster	(J.F. Gmelin, 1788)	White-bellied Sea-Eagle
Haliastur sphenurus	(Vieillot, 1818)	Whistling Kite
Haliastur indus	(Boddaert, 1783)	Brahminy Kite
Milvus migrans	(Boddaert, 1783)	Black Kite
Accipiter fasciatus	(Vigors & Horsfield, 1827)	Brown Goshawk
Accipiter cirrocephalus	(Vieillot, 1817)	Collared Sparrowhawk
Accipiter hiogaster	(S. Müller, 1841)	Variable Goshawk^{C}
Accipiter novaehollandiae	(J.F. Gmelin, 1788)	Grey Goshawk
Circus assimilis	Jardine & Selby, 1828	Spotted Harrier
Circus approximans	Peale, 1848	Swamp Harrier
Erythrotriorchis radiatus	(Latham, 1802)	Red Goshawk
Aquila gurneyi	G.R. Gray, 1860	Gurney's Eagle$^{TS/V}$
Aquila audax	(Latham, 1802)	Wedge-tailed Eagle
Hieraaetus morphnoides	(Gould, 1841)	Little Eagle

FALCONIFORMES

Falconidae

Falco cenchroides	Vigors & Horsfield, 1827	Nankeen Kestrel
Falco berigora	Vigors & Horsfield, 1827	Brown Falcon
Falco longipennis	Swainson, 1837	Australian Hobby
Falco hypoleucos	Gould, 1841	Grey Falcon
Falco subniger	G.R. Gray, 1843	Black Falcon
Falco peregrinus	Tunstall, 1771	Peregrine Falcon

GRUIFORMES

Gruidae

Grus antigone	(Linnaeus, 1758)	Sarus Crane
Grus rubicunda	(Perry, 1810)	Brolga

Rallidae

Porphyrio porphyrio	(Linnaeus, 1758)	Purple Swamphen
Porphyrio albus	(Shaw, 1790)	White Gallinule$^{LH/E}$
Eulabeornis castaneoventris	Gould, 1844	Chestnut Rail
Rallina tricolor	G.R. Gray, 1858	Red-necked Crake
Rallina fasciata	(Raffles, 1822)	Red-legged Crake^{V}
Lewinia pectoralis	(Temminck, 1831)	Lewin's Rail
Gallirallus philippensis	(Linnaeus, 1766)	Buff-banded Rail
Gallirallus sylvestris	(P.L. Sclater, 1869)	Lord Howe Woodhen^{LH}
Crex crex	(Linnaeus, 1758)	Corncrake^{V}
Porzana pusilla	(Pallas, 1776)	Baillon's Crake
Porzana fluminea	Gould, 1843	Australian Spotted Crake
Porzana fusca	(Linnaeus, 1766)	Ruddy-breasted Crake$^{C/V}$
Porzana tabuensis	(J.F. Gmelin, 1789)	Spotless Crake
Amaurornis cinerea	(Vieillot, 1819)	White-browed Crake
Amaurornis moluccana	Wallace, 1865	Pale-vented Bush-hen
Amaurornis phoenicurus	(Pennant, 1769)	White-breasted Waterhen^{V,C,CK}
Gallicrex cinerea	(J.F. Gmelin, 1789)	Watercock$^{C/V,(CK/V)}$
Tribonyx ventralis	(Gould, 1837)	Black-tailed Native-hen
Tribonyx mortierii	Du Bus, 1840	Tasmanian Native-hen
Gallinula tenebrosa	Gould, 1846	Dusky Moorhen
Fulica atra	Linnaeus, 1758	Eurasian Coot

Otididae

Ardeotis australis	(J.E. Gray, 1829)	Australian Bustard

CHARADRIIFORMES

Chionidae

Chionis minor	Hartlaub, 1841	Black-faced Sheathbill^{H}

Burhinidae

Burhinus grallarius	(Latham, 1802)	Bush Stone-curlew
Esacus magnirostris	Mathews, 1912	Beach Stone-curlew

Haematopodidae

Haematopus finschi	G.H. Martens, 1897	South Island Pied Oystercatcher^{V}
Haematopus longirostris	Vieillot, 1817	Australian Pied Oystercatcher
Haematopus fuliginosus	Gould, 1845	Sooty Oystercatcher

Recurvirostridae

Himantopus himantopus	(Linnaeus, 1758)	Black-winged Stilt
Recurvirostra novaehollandiae	Vieillot, 1816	Red-necked Avocet
Cladorhynchus leucocephalus	(Vieillot, 1816)	Banded Stilt

Charadriidae

Pluvialis fulva	(J.F. Gmelin, 1789)	Pacific Golden Plover
Pluvialis dominicus	(S. Müller, 1776)	American Golden Plover^{V}
Pluvialis squatarola	(Linnaeus, 1758)	Grey Plover
Charadrius hiaticula	Linnaeus, 1758	Ringed Plover^{V}
Charadrius dubius	Scopoli, 1786	Little Ringed Plover^{V}
Charadrius alexandrinus	Linnaeus, 1758	Kentish Plover^{V}
Charadrius ruficapillus	Temminck, 1822	Red-capped Plover
Charadrius bicinctus	Jardine & Selby, 1827	Double-banded Plover
Charadrius mongolus	Pallas, 1776	Lesser Sand Plover
Charadrius leschenaultii	Lesson, 1826	Greater Sand Plover
Charadrius asiaticus	Pallas, 1773	Caspian Plover$^{V,CK/V}$
Charadrius veredus	Gould, 1848	Oriental Plover
Charadrius australis	Gould, 1841	Inland Dotterel
Elseyornis melanops	(Vieillot, 1818)	Black-fronted Dotterel
Thinornis rubricollis	(J.F. Gmelin, 1789)	Hooded Plover
Erythrogonys cinctus	Gould, 1838	Red-kneed Dotterel
Vanellus tricolor	(Vieillot, 1818)	Banded Lapwing
Vanellus miles	(Boddaert, 1783)	Masked Lapwing
Vanellus cinereus	(Blyth, 1842)	Grey-headed Lapwing^{V}

Pedionomidae

Pedionomus torquatus	Gould, 1840	Plains-wanderer

Jacanidae		
Irediparra gallinacea	(Temminck, 1828)	Comb-crested Jacana
Hydrophasianus chirurgus	(Scopoli, 1786)	Pheasant-tailed Jacana^{V}
Rostratulidae		
Rostratula australis	(Gould, 1838)	Australian Painted Snipe
Scolopacidae		
Gallinago hardwickii	(J.E. Gray, 1831)	Latham's Snipe
Gallinago stenura	(Bonaparte, 1830)	Pin-tailed Snipe^{V,C}
Gallinago megala	Swinhoe, 1861	Swinhoe's Snipe
Limosa limosa	(Linnaeus, 1758)	Black-tailed Godwit
Limosa haemastica	(Linnaeus, 1758)	Hudsonian Godwit^{V}
Limosa lapponica	(Linnaeus, 1758)	Bar-tailed Godwit
Numenius minutus	Gould, 1841	Little Curlew
Numenius phaeopus	(Linnaeus, 1758)	Whimbrel
Numenius madagascariensis	(Linnaeus, 1766)	Eastern Curlew
Bartramia longicauda	(Bechstein, 1812)	Upland Sandpiper^{V}
Xenus cinereus	(Guldenstädt, 1775)	Terek Sandpiper
Actitis hypoleucos	(Linnaeus, 1758)	Common Sandpiper
Tringa ochropus	Linnaeus, 1758	Green Sandpiper^{V}
Tringa brevipes	(Vieillot, 1816)	Grey-tailed Tattler
Tringa incana	(J.F. Gmelin, 1789)	Wandering Tattler
Tringa erythropus	(Pallas, 1764)	Spotted Redshank^{V}
Tringa guttifer	(Nordmann, 1835)	Nordmann's Greenshank^{V}
Tringa nebularia	(Gunnerus, 1767)	Common Greenshank
Tringa flavipes	(J.F. Gmelin, 1789)	Lesser Yellowlegs^{V}
Tringa stagnatilis	(Bechstein, 1803)	Marsh Sandpiper
Tringa totanus	(Linnaeus, 1758)	Common Redshank
Tringa glareola	Linnaeus, 1758	Wood Sandpiper
Arenaria interpres	(Linnaeus, 1758)	Ruddy Turnstone
Limnodromus semipalmatus	(Blyth, 1848)	Asian Dowitcher
Limnodromus griseus	(J.F. Gmelin, 1789)	Short-billed Dowitcher^{V}
Calidris tenuirostris	(Horsfield, 1821)	Great Knot
Calidris canutus	(Linnaeus, 1758)	Red Knot
Calidris alba	(Pallas, 1764)	Sanderling
Calidris minuta	(Leisler, 1812)	Little Stint
Calidris ruficollis	(Pallas, 1776)	Red-necked Stint
Calidris subminuta	(Middendorff, 1853)	Long-toed Stint
Calidris fuscicollis	(Vieillot, 1819)	White-rumped Sandpiper^{V}

Calidris bairdii	(Coues, 1861)	Baird's Sandpiper^{V}
Calidris melanotos	(Vieillot, 1819)	Pectoral Sandpiper
Calidris acuminata	(Horsfield, 1821)	Sharp-tailed Sandpiper
Calidris alpina	(Linnaeus, 1758)	Dunlin^{V}
Calidris ferruginea	(Pontoppidan, 1763)	Curlew Sandpiper
Calidris himantopus	(Bonaparte, 1826)	Stilt Sandpiper^{V}
Tryngites subruficollis	(Vieillot, 1819)	Buff-breasted Sandpiper^{V}
Limicola falcinellus	(Pontoppidan, 1763)	Broad-billed Sandpiper
Philomachus pugnax	(Linnaeus, 1758)	Ruff
Steganopus tricolor	(Vieillot, 1819)	Wilson's Phalarope^{V}
Phalaropus lobatus	(Linnaeus, 1758)	Red-necked Phalarope
Phalaropus fulicarius	(Linnaeus, 1758)	Grey Phalarope^{V}

Turnicidae

Turnix maculosus	(Temminck, 1815)	Red-backed Button-quail
Turnix melanogaster	(Gould, 1837)	Black-breasted Button-quail
Turnix castanotus	(Gould, 1840)	Chestnut-backed Button-quail
Turnix olivii	Robinson, 1900	Buff-breasted Button-quail
Turnix varius	(Latham, 1802)	Painted Button-quail
Turnix pyrrhothorax	(Gould, 1841)	Red-chested Button-quail
Turnix velox	(Gould, 1841)	Little Button-quail

Glareolidae

Glareola maldivarum	J.R. Forster, 1795	Oriental Pratincole
Stiltia isabella	(Vieillot, 1816)	Australian Pratincole

Stercorariidae

Stercorarius maccormicki	Saunders, 1893	South Polar Skua
Stercorarius antarcticus	(Lesson, 1831)	Brown Skua
Stercorarius pomarinus	(Temminck, 1815)	Pomarine Jaeger
Stercorarius parasiticus	(Linnaeus, 1758)	Arctic Jaeger
Stercorarius longicaudus	Vieillot, 1819	Long-tailed Jaeger

Laridae

Anous stolidus	(Linnaeus, 1758)	Common Noddy
Anous minutus	Boie, 1844	Black Noddy
Anous tenuirostris	(Temminck, 1823)	Lesser Noddy
Gygis alba	(Sparrman, 1786)	White Tern^{V,LH,CK,N}
Procelsterna cerulea	(F.D. Bennett, 1840)	Grey Ternlet^{V,LH,N}
Onychoprion anaethetus	(Scopoli, 1786)	Bridled Tern
Onychoprion fuscata	(Linnaeus, 1758)	Sooty Tern
Sternula albifrons	(Pallas, 1764)	Little Tern

Sternula nereis	Gould, 1843	Fairy Tern
Gelochelidon nilotica	(J.F. Gmelin, 1789)	Gull-billed Tern
Hydroprogne caspia	(Pallas, 1770)	Caspian Tern
Chlidonias hybrida	(Pallas, 1811)	Whiskered Tern
Chlidonias leucopterus	(Temminck, 1815)	White-winged Black Tern
Chlidonias niger	(Linnaeus, 1758)	Black Tern^{V}
Sterna dougallii	Montagu, 1813	Roseate Tern
Sterna striata	J.F. Gmelin, 1789	White-fronted Tern
Sterna sumatrana	Raffles, 1822	Black-naped Tern
Sterna hirundo	Linnaeus, 1758	Common Tern
Sterna paradisaea	Pontoppidan, 1763	Arctic Tern
Sterna vittata	J.F. Gmelin, 1789	Antarctic Tern ^{V,M,H}
Thalasseus bengalensis	(Lesson, 1831)	Lesser Crested Tern
Thalasseus bergii	(M.H.K. Lichtenstein, 1823)	Crested Tern
Larus pacificus	Latham, 1802	Pacific Gull
Larus fuscus	Linnaeus, 1758	Lesser Black-backed Gull$^{CK/V}$
Larus dominicanus	M.H.K. Lichtenstein, 1823	Kelp Gull
Larus canus	Linnaeus, 1758	Mew Gull$^{C/V}$
Larus crassirostris	Vieillot, 1818	Black-tailed Gull^{V}
Leucophaeus atricilla	(Linnaeus, 1758)	Laughing Gull^{V}
Leucophaeus pipixcan	(Wagler, 1831)	Franklin's Gull^{V}
Chroicocephalus novaehollandiae	(Stephens, 1826)	Silver Gull
Chroicocephalus ridibundus	(Linnaeus, 1766)	Black-headed Gull$^{\backslash C/V}$
Xema sabini	(Sabine, 1819)	Sabine's Gull^{V}

PSITTACIFORMES

Nestoridae

Nestor productus	(Gould, 1836)	Norfolk Island Kaka$^{N/E}$

Cacatuidae

Probosciger aterrimus	(J.F. Gmelin, 1788)	Palm Cockatoo
Calyptorhynchus banksii	(Latham, 1790)	Red-tailed Black-Cockatoo
Calyptorhynchus lathami	(Temminck, 1807)	Glossy Black-Cockatoo
Calyptorhynchus funereus	(Shaw, 1794)	Yellow-tailed Black-Cockatoo
Calyptorhynchus latirostris	Carnaby, 1948	Carnaby's Black-Cockatoo
Calyptorhynchus baudinii	Lear, 1832	Baudin's Black-Cockatoo
Callocephalon fimbriatum	(Grant, 1803)	Gang-gang Cockatoo
Lophochroa leadbeateri	(Vigors, 1831)	Major Mitchell's Cockatoo
Eolophus roseicapillus	(Vieillot, 1817)	Galah
Cacatua tenuirostris	(Kuhl, 1820)	Long-billed Corella

Cacatua pastinator	(Gould, 1841)	Western Corella
Cacatua sanguinea	Gould, 1843	Little Corella
Cacatua galerita	(Latham, 1790)	Sulphur-crested Cockatoo
Nymphicus hollandicus	(Kerr, 1792)	Cockatiel

Psittacidae

Trichoglossus haematodus	(Linnaeus, 1771)	Rainbow Lorikeet
Trichoglossus chlorolepidotus	(Kuhl, 1820)	Scaly-breasted Lorikeet
Psitteuteles versicolor	(Lear, 1831)	Varied Lorikeet
Glossopsitta concinna	(Shaw, 1791)	Musk Lorikeet
Glossopsitta pusilla	(Shaw, 1790)	Little Lorikeet
Glossopsitta porphyrocephala	(Dietrichsen, 1837)	Purple-crowned Lorikeet
Cyclopsitta diophthalma	(Hombron & Jacquinot, 1841)	Double-eyed Fig-Parrot
Eclectus roratus	(S. Müller, 1776)	Eclectus Parrot
Geoffroyus geoffroyi	(Bechstein, 1811)	Red-cheeked Parrot
Alisterus scapularis	(M.H.K. Lichtenstein, 1816)	Australian King-Parrot
Aprosmictus erythropterus	(J.F. Gmelin, 1788)	Red-winged Parrot
Polytelis swainsonii	(Desmarest, 1826)	Superb Parrot
Polytelis anthopeplus	(Lear, 1831)	Regent Parrot
Polytelis alexandrae	Gould, 1863	Princess Parrot
Platycercus caledonicus	(J.F. Gmelin, 1788)	Green Rosella
Platycercus elegans	(J.F. Gmelin, 1788)	Crimson Rosella
Platycercus eximius	(Shaw, 1792)	Eastern Rosella
Platycercus adscitus	(Latham, 1790)	Pale-headed Rosella
Platycercus venustus	(Kuhl, 1820)	Northern Rosella
Platycercus icterotis	(Temminck & Kuhl, 1820)	Western Rosella
Barnardius zonarius	(Shaw, 1805)	Australian Ringneck
Purpureicephalus spurius	(Kuhl, 1820)	Red-capped Parrot
Northiella haematogaster	(Gould, 1838)	Blue Bonnet
Lathamus discolor	(Shaw, 1790)	Swift Parrot
Psephotus haematonotus	(Gould, 1838)	Red-rumped Parrot
Psephotus varius	Clark, 1910	Mulga Parrot
Psephotus chrysopterygius	Gould, 1857	Golden-shouldered Parrot
Psephotus dissimilis	Collett, 1898	Hooded Parrot
Psephotus pulcherrimus	(Gould, 1845)	Paradise Parrot$^{\mathrm{E}}$
Cyanoramphus cookii	(G.R. Gray, 1859)	Tasman Parakeet$^{\mathrm{LH/E,N}}$
Cyanoramphus novaezelandiae	(Sparrman, 1787)	Red-fronted Parakeet$^{\mathrm{M/E}}$
Melopsittacus undulatus	(Shaw, 1805)	Budgerigar
Neopsephotus bourkii	(Gould, 1841)	Bourke's Parrot
Neophema chrysostoma	(Kuhl, 1820)	Blue-winged Parrot

Neophema elegans	(Gould, 1837)	Elegant Parrot
Neophema petrophila	(Gould, 1841)	Rock Parrot
Neophema chrysogaster	(Latham, 1790)	Orange-bellied Parrot
Neophema pulchella	(Shaw, 1792)	Turquoise Parrot
Neophema splendida	(Gould, 1841)	Scarlet-chested Parrot
Pezoporus wallicus	(Kerr, 1792)	Ground Parrot
Pezoporus occidentalis	(Gould, 1861)	Night Parrot

CUCULIFORMES

Cuculidae		
Centropus bengalensis	(J.F. Gmelin, 1788)	Lesser Coucal$^{A/V}$
Centropus phasianinus	(Latham, 1802)	Pheasant Coucal
Eudynamys scolopaceus	(Linnaeus, 1758)	Asian Koel$^{C/V}$
Eudynamys orientalis	(Linnaeus, 1766)	Eastern Koel
Urodynamys taitensis	(Sparrman, 1787)	Long-tailed Cuckoo^{LH,N}
Scythrops novaehollandiae	Latham, 1790	Channel-billed Cuckoo
Chalcites basalis	(Horsfield, 1821)	Horsfield's Bronze-Cuckoo
Chalcites osculans	Gould, 1847	Black-eared Cuckoo
Chalcites lucidus	(J.F. Gmelin, 1788)	Shining Bronze-Cuckoo
Chalcites minutillus	(Gould, 1859)	Little Bronze-Cuckoo
Cacomantis pallidus	(Latham, 1802)	Pallid Cuckoo
Cacomantis castaneiventris	(Gould, 1867)	Chestnut-breasted Cuckoo
Cacomantis flabelliformis	(Latham, 1802)	Fan-tailed Cuckoo
Cacomantis variolosus	(Vigors & Horsfield, 1827)	Brush Cuckoo
Cuculus optatus	Gould, 1845	Oriental Cuckoo
Hierococcyx sparverioides	(Vigors, 1832)	Large Hawk-Cuckoo$^{C/V}$

STRIGIFORMES

Strigidae		
Ninox strenua	(Gould, 1838)	Powerful Owl
Ninox rufa	(Gould, 1846)	Rufous Owl
Ninox connivens	(Latham, 1802)	Barking Owl
Ninox novaeseelandiae	(J.F. Gmelin, 1788)	Southern Boobook
Ninox scutulata	(Raffles, 1822)	Brown Hawk-Owl$^{A/V}$
Ninox natalis	Lister, 1889	Christmas Island Hawk-Owl^{C}
Bubo ketupu	Horsfield, 1821	Buffy Fish-Owl^{CK}
Tytonidae		
Tyto tenebricosa	(Gould, 1845)	Sooty Owl
Tyto novaehollandiae	(Stephens, 1826)	Masked Owl

Tyto javanica	(J.F. Gmelin, 1788)	Eastern Barn Owl
Tyto longimembris	(Jerdon, 1839)	Eastern Grass Owl

CORACIIFORMES

Alcedinidae

Alcedo atthis	(Linnaeus, 1758)	Common Kingfisher$^{C/V}$
Ceyx azureus	(Latham, 1802)	Azure Kingfisher
Ceyx pusilla	Temminck, 1836	Little Kingfisher

Halcyonidae

Tanysiptera sylvia	Gould, 1850	Buff-breasted Paradise-Kingfisher
Dacelo novaeguineae	(Hermann, 1783)	Laughing Kookaburra
Dacelo leachii	Vigors & Horsfield, 1827	Blue-winged Kookaburra
Syma torotoro	Lesson, 1827	Yellow-billed Kingfisher
Todiramphus macleayii	(Jardine & Selby, 1830)	Forest Kingfisher
Todiramphus pyrrhopygius	(Gould, 1840)	Red-backed Kingfisher
Todiramphus sanctus	(Vigors & Horsfield, 1827)	Sacred Kingfisher
Todiramphus chloris	(Boddaert, 1783)	Collared Kingfisher
Halcyon pileata	(Boddaert, 1783)	Black-capped Kingfisher^{V}

Meropidae

Merops ornatus	Latham, 1802	Rainbow Bee-eater

Coraciidae

Eurystomus orientalis	(Linnaeus, 1766)	Dollarbird

PASSERIFORMES

Pittidae

Pitta erythrogaster	Temminck, 1823	Red-bellied Pitta
Pitta moluccensis	(S. Müller, 1776)	Blue-winged Pitta$^{V,C/V}$
Pitta versicolor	Swainson, 1825	Noisy Pitta
Pitta iris	Gould, 1842	Rainbow Pitta

Menuridae

Menura alberti	Bonaparte, 1850	Albert’s Lyrebird
Menura novaehollandiae	Latham, 1802	Superb Lyrebird

Atrichornithidae

Atrichornis rufescens	(E.P. Ramsay, 1867)	Rufous Scrub-bird
Atrichornis clamosus	(Gould, 1844)	Noisy Scrub-bird

Climacteridae

Cormobates leucophaea	(Latham, 1802)	White-throated Treecreeper
Climacteris affinis	Blyth, 1864	White-browed Treecreeper

Climacteris erythrops	Gould, 1841	Red-browed Treecreeper
Climacteris picumnus	Temminck, 1824	Brown Treecreeper
Climacteris melanura	Gould, 1843	Black-tailed Treecreeper
Climacteris rufa	Gould, 1841	Rufous Treecreeper
Ptilonorhynchidae		
Ailuroedus melanotis	(G.R. Gray, 1858)	Spotted Catbird
Ailuroedus crassirostris	(Paykull, 1815)	Green Catbird
Scenopoeetes dentirostris	E.P. Ramsay, 1876	Tooth-billed Bowerbird
Amblyornis newtonianus	(De Vis, 1883)	Golden Bowerbird
Sericulus chrysocephalus	(Lewin, 1808)	Regent Bowerbird
Ptilonorhynchus violaceus	(Vieillot, 1816)	Satin Bowerbird
Ptilonorhynchus maculatus	(Gould, 1837)	Spotted Bowerbird
Ptilonorhynchus guttatus	(Gould, 1862)	Western Bowerbird
Ptilonorhynchus nuchalis	(Jardine & Selby, 1830)	Great Bowerbird
Ptilonorhynchus cerviniventris	(Gould, 1850)	Fawn-breasted Bowerbird
Maluridae		
Malurus cyaneus	(Ellis, 1782)	Superb Fairy-wren
Malurus splendens	(Quoy & Gaimard, 1830)	Splendid Fairy-wren
Malurus coronatus	Gould, 1857	Purple-crowned Fairy-wren
Malurus melanocephalus	(Latham, 1802)	Red-backed Fairy-wren
Malurus leucopterus	Dumont, 1824	White-winged Fairy-wren
Malurus lamberti	Vigors & Horsfield, 1827	Variegated Fairy-wren
Malurus amabilis	Gould, 1852	Lovely Fairy-wren
Malurus pulcherrimus	Gould, 1844	Blue-breasted Fairy-wren
Malurus elegans	Gould, 1837	Red-winged Fairy-wren
Stipiturus malachurus	(Shaw, 1798)	Southern Emu-wren
Stipiturus mallee	A.J. Campbell, 1908	Mallee Emu-wren
Stipiturus ruficeps	A.J. Campbell, 1899	Rufous-crowned Emu-wren
Amytornis barbatus	Favaloro & McEvey, 1968	Grey Grasswren
Amytornis striatus	(Gould, 1840)	Striated Grasswren
Amytornis merrotsyi	Mellor, 1913	Short-tailed Grasswren
Amytornis woodwardi	E. Hartert, 1905	White-throated Grasswren
Amytornis dorotheae	(Mathews, 1914)	Carpentarian Grasswren
Amytornis textilis	(Dumont, 1824)	Thick-billed Grasswren
Amytornis purnelli	(Mathews, 1914)	Dusky Grasswren
Amytornis ballarae	Condon, 1969	Kalkadoon Grasswren
Amytornis goyderi	(Gould, 1875)	Eyrean Grasswren
Amytornis housei	(Milligan, 1902)	Black Grasswren

Dasyornithidae		
Dasyornis brachypterus	(Latham, 1802)	Eastern Bristlebird
Dasyornis longirostris	Gould, 1841	Western Bristlebird
Dasyornis broadbenti	(McCoy, 1867)	Rufous Bristlebird
Acanthizidae		
Pycnoptilus floccosus	Gould, 1851	Pilotbird
Origma solitaria	(Lewin, 1808)	Rockwarbler
Oreoscopus gutturalis	(De Vis, 1889)	Fernwren
Sericornis citreogularis	Gould, 1838	Yellow-throated Scrubwren
Sericornis frontalis	(Vigors & Horsfield, 1827)	White-browed Scrubwren
Sericornis humilis	Gould, 1838	Tasmanian Scrubwren
Sericornis keri	Mathews, 1920	Atherton Scrubwren
Sericornis magnirostra	(Gould, 1838)	Large-billed Scrubwren
Sericornis beccarii	Salvadori, 1874	Tropical Scrubwren
Acanthornis magna	(Gould, 1855)	Scrubtit
Hylacola pyrrhopygia	(Vigors & Horsfield, 1827)	Chestnut-rumped Heathwren
Hylacola cauta	Gould, 1843	Shy Heathwren
Calamanthus fuliginosus	(Vigors & Horsfield, 1827)	Striated Fieldwren
Calamanthus campestris	(Gould, 1841)	Rufous Fieldwren
Pyrrholaemus brunneus	Gould, 1841	Redthroat
Chthonicola sagittata	(Latham, 1802)	Speckled Warbler
Smicrornis brevirostris	(Gould, 1838)	Weebill
Gerygone mouki	Mathews, 1912	Brown Gerygone
Gerygone modesta	Pelzeln, 1860	Norfolk Island Gerygone[N]
Gerygone insularis	E.P. Ramsay, 1879	Lord Howe Gerygone[LH/E]
Gerygone levigaster	Gould, 1843	Mangrove Gerygone
Gerygone fusca	(Gould, 1838)	Western Gerygone
Gerygone tenebrosa	(R. Hall, 1901)	Dusky Gerygone
Gerygone magnirostris	Gould, 1843	Large-billed Gerygone
Gerygone chloronota	Gould, 1843	Green-backed Gerygone
Gerygone palpebrosa	Wallace, 1865	Fairy Gerygone
Gerygone albogularis	(Gould, 1838)	White-throated Gerygone
Acanthiza robustirostris	Milligan, 1903	Slaty-backed Thornbill
Acanthiza lineata	Gould, 1838	Striated Thornbill
Acanthiza nana	Vigors & Horsfield, 1827	Yellow Thornbill
Acanthiza chrysorrhoa	(Quoy & Gaimard, 1830)	Yellow-rumped Thornbill
Acanthiza uropygialis	Gould, 1838	Chestnut-rumped Thornbill
Acanthiza reguloides	Vigors & Horsfield, 1827	Buff-rumped Thornbill
Acanthiza inornata	Gould, 1841	Western Thornbill

Acanthiza iredalei	Mathews, 1911	Slender-billed Thornbill
Acanthiza ewingii	Gould, 1844	Tasmanian Thornbill
Acanthiza apicalis	Gould, 1847	Inland Thornbill
Acanthiza pusilla	(Shaw, 1790)	Brown Thornbill
Acanthiza katherina	De Vis, 1905	Mountain Thornbill
Aphelocephala leucopsis	(Gould, 1841)	Southern Whiteface
Aphelocephala pectoralis	(Gould, 1871)	Chestnut-breasted Whiteface
Aphelocephala nigricincta	(North, 1895)	Banded Whiteface
Pardalotidae		
Pardalotus punctatus	Shaw, 1792	Spotted Pardalote
Pardalotus quadragintus	Gould, 1838	Forty-spotted Pardalote
Pardalotus rubricatus	Gould, 1838	Red-browed Pardalote
Pardalotus striatus	(J.F. Gmelin, 1789)	Striated Pardalote
Meliphagidae		
Acanthorhynchus tenuirostris	(Latham, 1802)	Eastern Spinebill
Acanthorhynchus superciliosus	Gould, 1837	Western Spinebill
Certhionyx variegatus	Lesson, 1830	Pied Honeyeater
Meliphaga lewinii	(Swainson, 1837)	Lewin's Honeyeater
Meliphaga notata	(Gould, 1867)	Yellow-spotted Honeyeater
Meliphaga gracilis	(Gould, 1866)	Graceful Honeyeater
Meliphaga albilineata	(H.L. White, 1917)	White-lined Honeyeater
Meliphaga fordiana	Schodde, 1989	Kimberley Honeyeater
Lichenostomus frenatus	(E.P. Ramsay, 1875)	Bridled Honeyeater
Lichenostomus hindwoodi	(Longmore & Boles, 1983)	Eungella Honeyeater
Lichenostomus chrysops	(Latham, 1802)	Yellow-faced Honeyeater
Lichenostomus virescens	(Vieillot, 1817)	Singing Honeyeater
Lichenostomus versicolor	(Gould, 1843)	Varied Honeyeater
Lichenostomus fasciogularis	(Gould, 1854)	Mangrove Honeyeater
Lichenostomus unicolor	(Gould, 1843)	White-gaped Honeyeater
Lichenostomus flavus	(Gould, 1843)	Yellow Honeyeater
Lichenostomus leucotis	(Latham, 1802)	White-eared Honeyeater
Lichenostomus flavicollis	(Vieillot, 1817)	Yellow-throated Honeyeater
Lichenostomus melanops	(Latham, 1802)	Yellow-tufted Honeyeater
Lichenostomus cratitius	(Gould, 1841)	Purple-gaped Honeyeater
Lichenostomus keartlandi	(North, 1895)	Grey-headed Honeyeater
Lichenostomus ornatus	(Gould, 1838)	Yellow-plumed Honeyeater
Lichenostomus plumulus	(Gould, 1841)	Grey-fronted Honeyeater
Lichenostomus fuscus	(Gould, 1837)	Fuscous Honeyeater

Lichenostomus flavescens	(Gould, 1840)	Yellow-tinted Honeyeater
Lichenostomus penicillatus	(Gould, 1837)	White-plumed Honeyeater
Purnella albifrons	(Gould, 1841)	White-fronted Honeyeater
Manorina melanophrys	(Latham, 1802)	Bell Miner
Manorina melanocephala	(Latham, 1802)	Noisy Miner
Manorina melanotis	(F.E. Wilson, 1911)	Black-eared Miner
Manorina flavigula	(Gould, 1840)	Yellow-throated Miner
Acanthagenys rufogularis	Gould, 1838	Spiny-cheeked Honeyeater
Anthochaera lunulata	Gould, 1838	Western Wattlebird
Anthochaera chrysoptera	(Latham, 1802)	Little Wattlebird
Anthochaera phrygia	(Shaw, 1794)	Regent Honeyeater
Anthochaera carunculata	(Shaw, 1790)	Red Wattlebird
Anthochaera paradoxa	(Daudin, 1800)	Yellow Wattlebird
Ramsayornis modestus	(G.R. Gray, 1858)	Brown-backed Honeyeater
Ramsayornis fasciatus	(Gould, 1843)	Bar-breasted Honeyeater
Conopophila albogularis	(Gould, 1843)	Rufous-banded Honeyeater
Conopophila rufogularis	(Gould, 1843)	Rufous-throated Honeyeater
Conopophila whitei	(North, 1910)	Grey Honeyeater
Epthianura tricolor	Gould, 1841	Crimson Chat
Epthianura aurifrons	Gould, 1838	Orange Chat
Epthianura crocea	Castelnau & Ramsay, 1877	Yellow Chat
Epthianura albifrons	(Jardine & Selby, 1828)	White-fronted Chat
Ashbyia lovensis	(Ashby, 1911)	Gibberbird
Sugomel niger	(Gould, 1838)	Black Honeyeater
Myzomela obscura	Gould, 1843	Dusky Honeyeater
Myzomela erythrocephala	Gould, 1840	Red-headed Honeyeater
Myzomela sanguinolenta	(Latham, 1802)	Scarlet Honeyeater
Glycichaera fallax	Salvadori, 1878	Green-backed Honeyeater
Glyciphila melanops	(Latham, 1802)	Tawny-crowned Honeyeater
Cissomela pectoralis	(Gould, 1841)	Banded Honeyeater
Lichmera indistincta	(Vigors & Horsfield, 1827)	Brown Honeyeater
Phylidonyris pyrrhopterus	(Latham, 1802)	Crescent Honeyeater
Phylidonyris novaehollandiae	(Latham, 1790)	New Holland Honeyeater
Phylidonyris niger	(Bechstein, 1811)	White-cheeked Honeyeater
Trichodere cockerelli	(Gould, 1869)	White-streaked Honeyeater
Melithreptus gularis	(Gould, 1837)	Black-chinned Honeyeater
Melithreptus validirostris	(Gould, 1837)	Strong-billed Honeyeater
Melithreptus brevirostris	(Vigors & Horsfield, 1827)	Brown-headed Honeyeater
Melithreptus albogularis	Gould, 1848	White-throated Honeyeater

Melithreptus lunatus	(Vieillot, 1802)	White-naped Honeyeater
Melithreptus affinis	(Lesson, 1839)	Black-headed Honeyeater
Entomyzon cyanotis	(Latham, 1802)	Blue-faced Honeyeater
Philemon buceroides	(Swainson, 1838)	Helmeted Friarbird
Philemon argenticeps	Gould, 1840	Silver-crowned Friarbird
Philemon corniculatus	(Latham, 1790)	Noisy Friarbird
Philemon citreogularis	(Gould, 1837)	Little Friarbird
Xanthotis macleayanus	(E.P. Ramsay, 1875)	Macleay's Honeyeater
Xanthotis flaviventer	(Lesson, 1828)	Tawny-breasted Honeyeater
Plectorhyncha lanceolata	Gould, 1838	Striped Honeyeater
Grantiella picta	(Gould, 1838)	Painted Honeyeater
Pomatostomidae		
Pomatostomus temporalis	(Vigors & Horsfield, 1827)	Grey-crowned Babbler
Pomatostomus halli	Cowles, 1964	Hall's Babbler
Pomatostomus superciliosus	(Vigors & Horsfield, 1827)	White-browed Babbler
Pomatostomus ruficeps	(Hartlaub, 1852)	Chestnut-crowned Babbler
Orthonychidae		
Orthonyx temminckii	Ranzani, 1822	Australian Logrunner
Orthonyx spaldingii	E.P. Ramsay, 1868	Chowchilla
Psophodidae		
Cinclosoma punctatum	(Shaw, 1794)	Spotted Quail-thrush
Cinclosoma castanotum	Gould, 1840	Chestnut Quail-thrush
Cinclosoma cinnamomeum	Gould, 1846	Cinnamon Quail-thrush
Cinclosoma castaneothorax	Gould, 1849	Chestnut-breasted Quail-thrush
Psophodes olivaceus	(Latham, 1802)	Eastern Whipbird
Psophodes nigrogularis	Gould, 1844	Western Whipbird
Psophodes cristatus	(Gould, 1838)	Chirruping Wedgebill
Psophodes occidentalis	(Mathews, 1912)	Chiming Wedgebill
Neosittidae		
Daphoenositta chrysoptera	(Latham, 1802)	Varied Sittella
Campephagidae		
Coracina maxima	(Rüppell, 1839)	Ground Cuckoo-shrike
Coracina novaehollandiae	(J.F. Gmelin, 1789)	Black-faced Cuckoo-shrike
Coracina papuensis	(J.F. Gmelin, 1788)	White-bellied Cuckoo-shrike
Coracina lineata	(Swainson, 1825)	Barred Cuckoo-shrike
Coracina tenuirostris	(Jardine, 1831)	Cicadabird
Lalage sueurii	(Vieillot, 1818)	White-winged Triller

Lalage leucomela	(Vigors & Horsfield, 1827)	Varied Triller
Lalage leucopyga	(Gould, 1838)	Long-tailed Triller$^{N/E}$

Pachycephalidae

Falcunculus frontatus	(Latham, 1802)	Crested Shrike-tit
Pachycephala olivacea	Vigors & Horsfield, 1827	Olive Whistler
Pachycephala rufogularis	Gould, 1841	Red-lored Whistler
Pachycephala inornata	Gould, 1841	Gilbert's Whistler
Pachycephala pectoralis	(Latham, 1802)	Golden Whistler
Pachycephala melanura	Gould, 1843	Mangrove Golden Whistler
Pachycephala simplex	Gould, 1843	Grey Whistler
Pachycephala rufiventris	(Latham, 1802)	Rufous Whistler
Pachycephala lanioides	Gould, 1840	White-breasted Whistler
Colluricincla megarhyncha	(Quoy & Gaimard, 1830)	Little Shrike-thrush
Colluricincla boweri	E.P. Ramsay, 1885	Bower's Shrike-thrush
Colluricincla woodwardi	E. Hartert, 1905	Sandstone Shrike-thrush
Colluricincla harmonica	(Latham, 1802)	Grey Shrike-thrush
Oreoica gutturalis	(Vigors & Horsfield, 1827)	Crested Bellbird

Oriolidae

Sphecotheres vieilloti	Vigors & Horsfield, 1827	Australasian Figbird
Oriolus flavocinctus	(P.P. King, 1826)	Yellow Oriole
Oriolus sagittatus	(Latham, 1802)	Olive-backed Oriole

Artamidae

Artamus leucorynchus	(Linnaeus, 1771)	White-breasted Woodswallow
Artamus personatus	(Gould, 1841)	Masked Woodswallow
Artamus superciliosus	(Gould, 1837)	White-browed Woodswallow
Artamus cinereus	Vieillot, 1817	Black-faced Woodswallow
Artamus cyanopterus	(Latham, 1802)	Dusky Woodswallow
Artamus minor	Vieillot, 1817	Little Woodswallow
Cracticus quoyi	(Lesson & Garnot, 1827)	Black Butcherbird
Cracticus torquatus	(Latham, 1802)	Grey Butcherbird
Cracticus mentalis	Salvadori & D'Albertis, 1876	Black-backed Butcherbird
Cracticus nigrogularis	(Gould, 1837)	Pied Butcherbird
Cracticus tibicen	(Latham, 1802)	Australian Magpie
Strepera graculina	(Latham, 1802)	Pied Currawong
Strepera fuliginosa	(Gould, 1837)	Black Currawong
Strepera versicolor	(Latham, 1802)	Grey Currawong

Dicruridae

Dicrurus bracteatus	Gould, 1843	Spangled Drongo

Rhipiduridae		
Rhipidura rufifrons	(Latham, 1802)	Rufous Fantail
Rhipidura dryas	Gould, 1843	Arafura Fantail
Rhipidura fuliginosa	(Sparrman, 1787)	New Zealand Fantail$^{LH/E}$
Rhipidura albiscapa	Gould, 1840	Grey Fantail
Rhipidura phasiana	De Vis, 1884	Mangrove Grey Fantail
Rhipidura rufiventris	(Vieillot, 1818)	Northern Fantail
Rhipidura leucophrys	(Latham, 1802)	Willie Wagtail
Laniidae		
Lanius cristatus	Linnaeus, 1758	Brown Shrike$^{C/V}$
Lanius tigrinus	Drapiez, 1828	Tiger Shrike^{V}
Corvidae		
Pica pica	(Linnaeus, 1758)	Black-billed Magpie^{V}
Corvus coronoides	Vigors & Horsfield, 1827	Australian Raven
Corvus tasmanicus	Mathews, 1912	Forest Raven
Corvus mellori	Mathews, 1912	Little Raven
Corvus bennetti	North, 1901	Little Crow
Corvus orru	Bonaparte, 1850	Torresian Crow
Corvus splendens	(Vieillot, 1817)	House Crow
Monarchidae		
Myiagra ruficollis	(Vieillot, 1818)	Broad-billed Flycatcher
Myiagra rubecula	(Latham, 1802)	Leaden Flycatcher
Myiagra cyanoleuca	(Vieillot, 1818)	Satin Flycatcher
Myiagra alecto	(Temminck, 1827)	Shining Flycatcher
Myiagra inquieta	(Latham, 1802)	Restless Flycatcher
Carterornis leucotis	(Gould, 1851)	White-eared Monarch
Monarcha melanopsis	(Vieillot, 1818)	Black-faced Monarch
Monarcha frater	P.L. Sclater, 1874	Black-winged Monarch
Monarcha cinerascens	(Temminck, 1827)	Island Monarch$^{A/V}$
Symposiarchus trivirgatus	(Temminck, 1826)	Spectacled Monarch
Grallina cyanoleuca	(Latham, 1802)	Magpie-lark
Arses telescopthalmus	(Lesson & Garnot, 1827)	Frilled Monarch
Arses kaupi	Gould, 1851	Pied Monarch
Machaerirhynchus flaviventer	Gould, 1851	Yellow-breasted Boatbill
Corcoracidae		
Corcorax melanorhamphos	(Vieillot, 1817)	White-winged Chough
Struthidea cinerea	Gould, 1837	Apostlebird

Paradisaeidae		
Phonygammus keraudrenii	(Lesson & Garnot, 1826)	Trumpet Manucode
Ptiloris paradiseus	Swainson, 1825	Paradise Riflebird
Ptiloris victoriae	Gould, 1849	Victoria's Riflebird
Ptiloris magnificus	(Vieillot, 1819)	Magnificent Riflebird
Petroicidae		
Microeca fascinans	(Latham, 1802)	Jacky Winter
Microeca flavigaster	Gould, 1843	Lemon-bellied Flycatcher
Microeca griseoceps	De Vis, 1894	Yellow-legged Flycatcher
Petroica multicolor	(J.F. Gmelin, 1789)	Pacific Robin
Petroica boodang	(Lesson, 1838)	Scarlet Robin
Petroica goodenovii	(Vigors & Horsfield, 1827)	Red-capped Robin
Petroica phoenicea	Gould, 1837	Flame Robin
Petroica rosea	Gould, 1840	Rose Robin
Petroica rodinogaster	(Drapiez, 1819)	Pink Robin
Melanodryas cucullata	(Latham, 1802)	Hooded Robin
Melanodryas vittata	(Quoy & Gaimard, 1830)	Dusky Robin
Tregellasia capito	(Gould, 1854)	Pale-yellow Robin
Tregellasia leucops	(Salvadori, 1876)	White-faced Robin
Eopsaltria australis	(Shaw, 1790)	Eastern Yellow Robin
Eopsaltria griseogularis	Gould, 1838	Western Yellow Robin
Eopsaltria georgiana	(Quoy & Gaimard, 1830)	White-breasted Robin
Peneonanthe pulverulenta	(Bonaparte, 1850)	Mangrove Robin
Heteromyias cinereifrons	E.P. Ramsay, 1876	Grey-headed Robin
Poecilodryas superciliosa	(Gould, 1847)	White-browed Robin
Poecilodryas cerviniventris	(Gould, 1858)	Buff-sided Robin
Drymodes superciliaris	Gould, 1850	Northern Scrub-robin
Drymodes brunneopygia	Gould, 1841	Southern Scrub-robin
Alaudidae		
Mirafra javanica	Horsfield, 1821	Horsfield's Bushlark
Alauda arvensis	Linnaeus, 1758	Eurasian Skylark[I]
Cisticolidae		
Cisticola juncidis	(Rafinesque, 1810)	Zitting Cisticola
Cisticola exilis	(Vigors & Horsfield, 1827)	Golden-headed Cisticola
Acrocephalidae		
Acrocephalus australis	(Gould, 1838)	Australian Reed-Warbler
Acrocephalus orientalis	(Temminck & Schlegel, 1847)	Oriental Reed-Warbler[V]

Megaluridae		
Megalurus timoriensis	Wallace, 1864	Tawny Grassbird
Megalurus gramineus	(Gould, 1845)	Little Grassbird
Cincloramphus mathewsi	Iredale, 1911	Rufous Songlark
Cincloramphus cruralis	(Vigors & Horsfield, 1827)	Brown Songlark
Eremiornis carteri	North, 1900	Spinifexbird
Timaliidae		
Zosterops natalis	Lister, 1889	Christmas Island White-eye$^{C,CK/I}$
Zosterops citrinella	Bonaparte, 1850	Pale White-eye
Zosterops luteus	Gould, 1843	Yellow White-eye
Zosterops lateralis	(Latham, 1802)	Silvereye
Zosterops strenuus	Gould, 1855	Robust White-eye$^{LH/E}$
Zosterops tenuirostris	Gould, 1837	Slender-billed White-eye^{N}
Zosterops albogularis	Gould, 1837	White-chested White-eye$^{N/E?}$
Phylloscopidae		
Phylloscopus borealis	(Blasius, 1858)	Arctic Warbler$^{V,A/V}$
Hirundinidae		
Cheramoeca leucosterna	(Gould, 1841)	White-backed Swallow
Hirundo rustica	Linnaeus, 1758	Barn Swallow
Hirundo neoxena	Gould, 1842	Welcome Swallow
Petrochelidon ariel	(Gould, 1842)	Fairy Martin
Petrochelidon nigricans	Vieillot, 1817	Tree Martin
Cecropis daurica	Laxmann, 1769	Red-rumped Swallow$^{V,C/V}$
Delichon dasypus	(Bonaparte, 1850)	Asian House Martin$^{C/V}$
Pycnonotidae		
Pycnonotus jocosus	(Linnaeus, 1766)	Red-whiskered Bulbul^{I}
Muscicapidae		
Monticola solitarius	(Linnaeus, 1758)	Blue Rock Thrush^{V}
Oenanthe isabellina	(Temminck, 1829)	Isabelline Wheatear^{V}
Ficedula narcissina	(Temminck, 1836)	Narcissus Flycatcher^{V}
Cyanoptila cyanomelana	(Temminck, 1829)	Blue-and-White Flycatcher$^{V,C/V}$
Turdidae		
Zoothera lunulata	(Latham, 1802)	Bassian Thrush
Zoothera heinei	(Cabanis, 1850)	Russet-tailed Thrush
Turdus merula	Linnaeus, 1758	Common Blackbird^{I}
Turdus poliocephalus	Latham, 1802	Island Thrush$^{C,LH/E,N/E}$
Turdus philomelos	C.L. Brehm, 1831	Song Thrush^{I}

Sturnidae		
Aplornis cantoroides	(G.R. Gray, 1862)	Singing Starling^{TS}
Aplornis fusca	Gould, 1836	Tasman Starling$^{N/E,LH/E}$
Aplornis metallica	(Temminck, 1824)	Metallic Starling
Sturnus vulgaris	Linnaeus, 1758	Common Starling^{I}
Sturnus sturninus	(Pallas, 1776)	Purple-backed Starling$^{C/V}$
Sturnus roseus	(Linnaeus, 1758)	Rosy Starling^{V}
Sturnus tristis	(Linnaeus, 1766)	Common Myna^{I}
Nectariniidae		
Dicaeum geelvinkianum	A.B. Meyer, 1874	Red-capped Flowerpecker^{TS}
Dicaeum hirundinaceum	(Shaw, 1792)	Mistletoebird
Nectarinia jugularis	(Linnaeus, 1766)	Olive-backed Sunbird
Estrildidae		
Taeniopygia guttata	(Vieillot, 1817)	Zebra Finch
Taeniopygia bichenovii	(Vigors & Horsfield, 1827)	Double-barred Finch
Poephila acuticauda	(Gould, 1840)	Long-tailed Finch
Poephila cincta	(Gould, 1837)	Black-throated Finch
Poephila personata	Gould, 1842	Masked Finch
Neochmia phaeton	(Hombron & Jacquinot, 1841)	Crimson Finch
Neochmia ruficauda	(Gould, 1837)	Star Finch
Neochmia modesta	(Gould, 1837)	Plum-headed Finch
Neochmia temporalis	(Latham, 1802)	Red-browed Finch
Stagonopleura guttata	(Shaw, 1796)	Diamond Firetail
Stagonopleura bella	(Latham, 1802)	Beautiful Firetail
Stagonopleura oculata	(Quoy & Gaimard, 1830)	Red-eared Firetail
Emblema pictum	Gould, 1842	Painted Finch
Erythrura trichroa	(Kittlitz, 1835)	Blue-faced Parrot-Finch
Erythrura gouldiae	(Gould, 1844)	Gouldian Finch
Lonchura punctulata	(Linnaeus, 1758)	Nutmeg Mannikin^{I}
Lonchura pallida	(Wallace, 1863)	Pale-headed Munia$^{A/V}$
Lonchura flaviprymna	(Gould, 1845)	Yellow-rumped Mannikin
Lonchura castaneothorax	(Gould, 1837)	Chestnut-breasted Mannikin
Lonchura oryzivora	(Linnaeus, 1758)	Java Sparrow$^{C/I}$
Heteromunia pectoralis	(Gould, 1841)	Pictorella Mannikin
Passeridae		
Passer domesticus	(Linnaeus, 1758)	House Sparrow^{I}
Passer montanus	(Linnaeus, 1758)	EurasianTree Sparrow^{I}

Motacillidae		
Anthus novaeseelandiae	(J.F. Gmelin, 1789)	Australasian Pipit
Anthus cervinus	(Pallas, 1811)	Red-throated Pipit^{V}
Anthus gustavi	Swinhoe, 1863	Pechora Pipit$^{A/V}$
Motacilla tschutschensis	J.F. Gmelin, 1789	Eastern Yellow Wagtail
Motacilla taivana	(Swinhoe, 1863)	Green-headed Yellow Wagtail
Motacilla citreola	Pallas, 1776	Citrine Wagtail^{V}
Motacilla cinerea	Tunstall, 1771	Grey Wagtail^{V,C}
Motacilla alba	Linnaeus, 1758	White Wagtail^{V}
Fringillidae		
Fringilla coelebs	Linnaeus, 1758	Common Chaffinch$^{LH/VI, N/VI}$
Carduelis carduelis	(Linnaeus, 1758)	European Goldfinch^{I}
Acanthis flammea	(Linnaeus, 1758)	Common Redpoll$^{LH/I,M/I}$
Chloris chloris	(Linnaeus, 1758)	Common Greenfinch^{I}
Emberizidae		
Emberiza citrinella	Linnaeus, 1758	Yellowhammer$^{LH/V}$

Supplementary list

This list includes introduced species that were established, but have now been extirpated, those species in the literature that are now not accepted and reports of vagrant species still under review by BARC at the time of writing.

GALLIFORMES

Alectoris chukar	(J.E. Gray, 1830)	Chukar Partridge

ANSERIFORMES

Anas gibberifrons	S. Müller, 1842	Sunda Teal

COLUMBIFORMES

Caloenas nicobarica	(Linnaeus, 1758)	Nicobar Pigeon
Ptilinopus wallacii	(G.R. Gray, 1858)	Wallace's Fruit-Dove

APODIFORMES

Aerodramus maximus	(Hume, 1878)	Black-nest Swiftlet
Aerodramus fuciphagus	(Thunberg, 1812)	Edible-nest Swiftlet
Hirundapus cochinchinensis	(Oustalet, 1878)	Brown-backed Needletail
Hirundapus giganteus	(Temminck, 1839)	Silver-backed Needletail

PROCELLARIIFORMES

Pterodroma brevipes	(Peale, 1848)	Collared Petrel
Pterodroma pycrofti	Falla, 1933	Pycroft's Petrel

CICONIIFORMES

Ardea purpurea	Linnaeus, 1766	Purple Heron
Egretta gularis	(Bosc, 1792)	Western Reef Egret

ACCIPITRIFORMES

Butastur teesa	(Franklin, 1831)	White-eyed Buzzard

FALCONIFORMES

Falco subbuteo	Linneaus, 1758	Eurasian Hobby

GRUIFORMES

Gallirallus australis	(Sparrman, 1786)	Weka

CHARADRIIFORMES

Pluvialis apricaria	(Linnaeus, 1758)	Eurasian Golden Plover
Numenius tahitiensis	(J.F. Gmelin, 1789)	Bristle-thighed Curlew
Sternula saundersi	(Hume, 1877)	Saunder's Tern
Sterna virgata	Cabanis, 1875	Kerguelen Tern

CUCULIFORMES		
Surniculus lugubris	(Horsfield, 1821)	Asian Drongo-Cuckoo
Cuculus saturatus	Blyth, 1843	Himalayan Cuckoo

CORACIIFORMES		
Tanysiptera galatea	G.R. Gray, 1859	Common Paradise-Kingfisher
Dacelo gaudichaud	Quoy & Gaimard, 1824	Rufous-bellied Kookaburra

PASSERIFORMES		
Coracina personata	(S. Müller, 1843)	Wallacean Cuckoo-shrike
Locustella ochotensis	(Middendorff, 1853)	Middendorff's Warbler
Hirundo tahitica	J.F. Gmelin, 1789	Pacific Swallow
Pycnonotus cafer	(Linnaeus, 1766)	Red-vented Bulbul
Muscicapa sibirica	J.F. Gmelin, 1789	Dark-sided Flycatcher
Muscicapa dauurica	Pallas, 1811	Asian Brown Flycatcher
Ploceus hypoxanthus	(Sparrman, 1788)	Asian Golden Weaver
Euplectes albonotatus	(Cassin, 1848)	White-winged Widowbird
Euplectes orix	(Linnaeus, 1758)	Red Bishop
Lonchura malacca	(Linnaeus, 1766)	Black-headed Mannikin
Lonchura tristissima	(Wallace, 1865)	Streak-headed Mannikin

Higher-level avian systematics

The higher-level relationships within birds have received considerable attention in the past decade or so, using both molecular and morphological studies. Among these was the pioneering DNA–DNA hybridisation work of Sibley and Ahlquist (1990). Their unconventional classification, as set out in Sibley *et al.* (1988) and Sibley and Monroe (1990), was discussed in the introduction. Several facets of their arrangement have been supported by subsequent authors, while other areas await further corroboration or have been contradicted – this reflects the situation in avian phylogeny over the past 15 or so years. A growing consensus is being achieved on certain sections of avian phylogeny, but other parts have thus far evaded agreement. This section summarises the work over that period as it applies to the orders of Australian birds as conventionally recognised.

Palaeognathae (Struthioniformes – Casuariiformes)

All living birds fall into the subclass Neornithes. Its first major division is between the Palaeognathae and the Neognathae. The former comprises the ratite birds (ostrich, emus, cassowaries, rheas, kiwis, extinct moas and elephantbirds) and the Neotropical tinamous (Tinamidae). The monophyly of this assemblage has been corroborated by numerous studies using a range of techniques. Among the more recent are DNA–DNA hybridisation (Sibley and Ahlquist 1990); DNA sequences of mitochondrial and/or nuclear genes (Groth and Barrowclough 1999; van Tuinen *et al.* 2000; Braun and Kimball 2002; García-Moreno *et al.* 2003; Cracraft *et al.* 2004); DNA strings (Edwards *et al.* 2002); sex chromosomes (Ansari *et al.* 1988; Ogawa *et al.* 1998; García-Moreno and Mindell 2000); and morphology, particularly osteology (Cracraft and Clarke 2001; Livezey and Zusi 2001; Mayr and Clarke 2003).

Hårlid *et al.* (1997, 1998) and Mindell *et al.* (1997, 1999) achieved results that showed the Passeriformes occupied a basal position in the avian tree and that the palaeognaths were embedded within the remaining living birds. These false findings are now recognised as resulting from certain methodological problems.

It is now generally accepted that the living ratites (and recently extinct moas, Dinornithidae and Emeidae, and elephantbirds, Aepyornithidae) form a monophyletic group. (An exception is Braun and Kimball [2002], who obtained a polyphyletic ratite assemblage under certain analytical parameters.) Despite this concensus, there has been variation in the taxonomic level at which these component taxa have been recognised. At times, most of the living groups were each maintained at the ordinal level as Struthioniformes (Ostrich), Casuariiformes (cassowaries and emus), Rheiformes (rheas) and Apterygiformes (kiwis). Mayr (1979) reduced these to suborders within a single order, Struthioniformes – a treatment supported by subsequent work (e.g. Sibley and Monroe 1990, based on DNA–DNA hybridisation studies of Sibley and Ahlquist 1981, 1990; Cooper *et al.* 1992, mitochondrial 12S RNA gene). Given that estimated divergence times (68–89 million years) for some of the early branches of this assemblage (Cooper *et al.* 2001) are comparable to those proposed between other extant orders, it is perhaps more prudent to retain five orders for living ratites for now. These five orders plus the tinamous (Tinamiformes) comprise the Palaeognathae – an arrangement accepted here.

While there is growing agreement regarding the monophyly of the living ratites, there is less consensus about the inter-relationships of these ratite groups. A cassowary–emu sister relationship has been almost universally acknowledged. Bledsoe (1988), Cooper *et al.* (1992, 2001), Haddrath and Baker (2001) and Lee *et al.* (1997; based on molecular characters) concluded that the kiwis were the sister group to the cassowary–emu clade. Other authors (e.g. Lee *et al.* 1997, based on morphological characters; Livezey and Zusi 2001; Zelenitsky and Modesto 2003) placed the kiwis in a clade with the moas or as a sister group to the other living ratites. These and other workers (e.g. van Tuinen *et al.* 1998) have similarly disagreed with the relative positions of the ostrich and rheas, which either together form a clade, or one or the other forms a sister lineage to the cassowary–emu(–kiwi) clade. For the purposes of the Australian taxa, the Struthioniformes are placed before the Casuariiformes in the sequence.

Neognathae

Galloanseres (Galliformes – Anseriformes)

Within the Neognathae, there is a major dichotomy between the Galloanseres (Anseriformes, waterfowl, and the Galliformes, landfowl) and all remaining birds (Neoaves). The validity of the monophyly of the Galloanseres and its segregation from other neognath birds is now well established (*pace* Olson and Feduccia 1980a; Ericson 1996, 1997; Ericson *et al.* 2001) using a variety of molecular techniques such as microcomplement fixation (Ho *et al.* 1976), amino acid sequencing (Stapel *et al.* 1984), ribosomal DNA analysis (Mindell and Honeycutt 1989), DNA–DNA hybridisation (Sibley and Ahlquist 1990), DNA sequences (Kimball *et al.* 1999; van Tuinen *et al.* 2000; Braun and Kimball 2002; García-Moreno *et al.* 2003; Chubb 2004a; Cracraft *et al.* 2004; Slack *et al.* 2006), glycoprotein structure (Suzuki *et al.* 2004), and morphology (Cracraft 1988; Cracraft and Mindell 1989; Dzerzhinsky 1995; Livezey 1997; Weber 1996; Zusi and Livezey 2000; Cracraft and Clarke 2001; Livezey and Zusi 2001; Mayr and Clarke 2003).

Neoaves

The remaining orders of birds, comprising the Neoaves (= Plethornithae of Groth and Barrowclough 1999), are not as easily arranged. This may be the result of very rapid early diversification within this group (Poe and Chubb 2004). This results in a phylogeny of birds that is more reminiscent of a ‘comb’ than a tree (Cracraft *et al.* 2004). While a consistent overall arrangement has been elusive – with disagreements common between different works – there are some clusters of taxa that are supported with varying degrees of confidence. At the same time, some traditional associations of orders or families within orders have not been sustained, and a few novel and unexpected connections have been discovered.

Reflecting these findings in a linear classification inevitably produces an inadequate picture of a 'tree of life' with its many spatial and temporal dimensions. The lack of a cohesive phylogenetic arrangement means that any taxonomic sequence can only be regarded as an estimate of relationships, with the certain expectation that it will require ongoing modification.

Several studies have suggested new groupings within the Neoaves. Woodbury (1998) found that there are two structures of the dorsal horn of the grey matter in the avian spinal cord: single (leiocerate); and split or double (schizocerate). The leiocerate condition characterises the palaeognaths, Columbidae, Cuculidae, Passeriformes and most of the Gruiformes and Piciformes. All other groups examined were schizocerate. The taxonomic distribution of these structures does not correspond particularly well with the phylogenies obtained from various independent molecular studies, and it is not clear how this character should be interpreted. Nonetheless, it does indicate that some traditional orders are not uniform in regard to the possession of either a single or double dorsal horn.

Fain and Houde (2004) included a large taxonomic coverage of non-passerines (73 families) in their study of intron 7 of the ß-fibrinogen gene. They recovered the palaeognaths and the Galloanseres as monophyletic groups. Within the Neoaves, they found four indels (insertions/deletions) that helped identify two major clades of neognath birds. These clades, which Fain and Houde called the Metaves and Coronaves, exhibit extensive morphological and ecological convergence between their members. Groups of outwardly similar birds, often conventionally placed together in the same order, are split and distributed between these clades. According to these findings, Metaves – the smaller clade – contains grebes, tropicbirds, flamingos, mesites, kagus, sunbitterns, sandgrouse, pigeons, caprimulgiforms, swifts and hummingbirds, while all other neoavian birds belong to the Coronaves. The internal branching pattern of the Metaves was not well resolved, and relationships between its component groups could not be determined, whereas some of the branches in the Coronaves received strong statistical support. The conclusions of this study were that several conventional orders (Pelecaniformes, Falconiformes and Gruiformes) are polyphyletic as a result of placing together morphologically similar forms, whose structural and ecological resemblances are the result of convergence.

Ericson *et al.* (2006), using five nuclear genes, corroborated the split between the Metaves and Coronaves and confirmed the composition of these groups. Some of the internal branching patterns were better resolved than in the study by Fain and Houde (2004), while other patterns received insufficient support to accept at present. Other work, as yet unpublished, adds further support to these findings. Slack *et al.* (2006) incorporated a broad taxon sampling using DNA sequence data, but did not include any members from the Metaves, so their results are not applicable to testing this arrangement.

The division of the Neoaves into the Metaves and Coronaves is adopted for this list, with the following provisions. Where relationships within either group were recovered in both Fain and Houde (2004) and Ericson *et al.* (2006), they are incorporated here. When some subclades appeared only in the better resolved phylogeny of Ericson *et al.* (2006), they are tentatively incorporated here only if they agree with other published work. Many internal patterns are still largely uncertain, with a number of polychotomies. For the purposes of the present linear sequence, the taxa comprising a polychotomy are placed in the same relative positions that they occupied in the list of Christidis and Boles (1994).

Metaves

Within the Metaves, the following taxa are represented in Australia: tropicbirds, grebes, flamingos, pigeons, caprimulgiforms and swifts. Non-Australian members are the mesites, kagu, sunbittern, sandgrouse, tree swifts and hummingbirds.

Phaethontiformes

Validity of the inclusion of the Phaethontidae (tropicbirds) in the Pelecaniformes (pelicans, cormorants, darters, boobies, frigatebirds) has been long debated. Although sharing a totipalmate foot, these birds lack the gular pouch found in other members. Some authors (e.g. Cracraft 1985, Olson 1985a) concluded that the Pelecaniformes, including the Phaethontidae, was a natural assemblage, while others (e.g. Sibley and Ahlquist 1990) could discern no obvious affinities of the tropicbirds. Fain and Houde (2004) and Ericson *et al.* (2006) demonstrated that the Phaethontidae have no connection with the remainder of the traditional Pelecaniformes, which are in the Coronaves. On current information, this family shows no obvious closest relationship with any other group of birds. Here the tropicbirds are segregated into their own order and placed first in the linear sequence within the Metaves.

Podicipediformes – Phoenicopteriformes

The systematic affinities of the Podicipediformes (grebes) and Phoenicopteriformes (flamingos) have been poorly resolved. In traditional ordinal sequences, grebes have been placed next to Gaviiformes (loons) (e.g. Peters 1931; Mayr and Amadon 1951; Wetmore 1960) – a conclusion made by Cracraft (1981, 1988) and Livezey and Zusi (2007) based on a range of morphological characters. DNA–DNA hybridisation data (Sibley and Ahlquist 1990) did not identify a particularly close association between the two.

Flamingos were conventionally included with other long-legged waterbirds in the Ciconiiformes (e.g. Peters 1931; Sibley 1960; Wetmore 1960). They have also been associated with the Anseriformes (waterfowl) and Charadriiformes (Feduccia 1978; Olson and Feduccia 1980a, b; Jacob and Hoerschelmann 1985). More specifically, Olson and Feduccia (1980b) advocated including the flamingos in the Charadriiformes, closest to the Recurvirostridae (stilts and avocets). Kahl (1979a), del Hoyo *et al.* (1992), Christidis and Boles (1994) and others placed them in their own order, as did Livezey and Zusi (2007), as the sister taxon to the Ciconiiformes.

Analyses of DNA–DNA hybridisation distances and DNA sequence data from both mitochondrial and nuclear genes (van Tuinen *et al.* 2001) and from osteology (Mayr and Clarke 2003; Mayr 2004; Manegold 2006) arrived at an unexpected identification of a strongly supported sister relationship between grebes and flamingos. This was supported by Cracraft *et al.* (2004) and Ericson *et al.* (2006) (but see Storer 2006 for a rebuttal of this arrangement). These conclusions appear robust, although further investigation of this remarkable result is desirable. This clade was given the name Mirandornithes by Sangster (2005a). These orders are placed consecutively in the list.

Columbiformes

Traditionally, the pigeons and sandgrouse have been treated as two suborders, Columbae and Pterocletes, respectively, in the Columbiformes (e.g. Peters 1937 Wetmore 1960), although other authors (e.g. Maclean 1967) argued that closer links existed between the sandgrouse and shorebirds (Charadriiformes). The DNA–DNA hybridisation study of Sibley and Ahlquist (1990) supported the latter treatment with sandgrouse the sister lineage of the shorebirds. These authors concluded that morphological similarities between sandgrouse and pigeons were due to convergence or retention of ancestral characters. Shapiro *et al.* (2002) examined relationships between pigeons, sandgrouse, cranes, buttonquails, gulls and skuas, mousebirds (Coliidae) and parrots (Psittacidae) using cytochrome-*b* and 12S ribosomal gene DNA sequences. They observed the pigeons to be most closely associated with the gulls and skuas and, by implication, other shorebirds. In del Hoyo *et al.* (1997), the sandgrouse were accorded their own order (Pterocliformes) directly preceding the Columbiformes in the linear sequence. Both the sandgrouse and pigeons are part of the Metaves, and are possibly sister taxa (e.g. Ericson *et al.* 2006). Neither is close to the Charadriiformes (contra Shapiro *et al.* 2002). Only the pigeons occur in Australia.

Caprimulgiformes – Apodiformes

A relationship of the Caprimulgiformes with the Strigiformes has been suggested (e.g. Sibley and Ahlquist 1990; Bleweiss *et al.* 1994), as has one with the Apodiformes (e.g. Cracraft 1981, 1988; see also comments in Brooke 1970). The latter was accepted as a working hypothesis for many years with limited published support. Olson (1985a) raised the possibility that the Apodiformes might be derived from within the Caprimulgiformes. Recent work has supported a relationship between these two orders as sister taxa (Mayr *et al.* 2003; Cracraft *et al.* 2004; Ericson *et al.* 2006). A close relationship between nightjars and owls is not supported (see discussion under Strigiformes).

It has never been unequivocally demonstrated that those families traditionally included in the Caprimulgiformes are a monophyletic assemblage. Peters (1940) divided the order into two suborders: monotypic Steatornithes, comprising the Steatornithidae (*Steatornis caripensis;* Oilbird) of South America, and Caprimulgi, with four families: Podargidae (frogmouths), Nyctibiidae (potoos), Aegothelidae (owlet-nightjars) and Caprimulgidae (containing two subfamilies, the Chordeilinae [nighthawks] and Caprimulginae [nightjars]).

Mayr (2002) could not conclusively resolve the affinities of *Steatornis*, but subsequently reported evidence of a relationship with the tropical Trogonidae (Mayr 2003; Mayr and Clarke 2003). Barrowclough *et al.* (2006) also failed to confirm with what other taxon *Steatornis* was most closely associated.

There were also difficulties in finding the position of *Podargus*. Both it and *Steatornis* fell outside a clade of the other caprimulgiform taxa and the Apodiformes. Mayr (1998: morphology) and Mayr *et al.* (2003: morphology and molecular data) found a potential connection between *Podargus* and the Leptosomatidae (cuckoo-rollers) of Madagascar. Fain and Houde (1994) and Ericson *et al.* (2006), however, recovered these as members of the Metaves and Coronaves, respectively. The latter authors found that the Podargidae formed part of the same clade as the other caprimulgiform families. In the study by Barrowclough *et al.* (2006), the Podargidae were the sister taxon to the Caprimulgidae (including *Eurostopodus*). Consequently, here the frogmouths are retained in the Caprimulgiformes.

The conventionally accepted relationship between the nightjars and the potoos was supported by Mayr (2002) using osteological characters, but could not be confirmed by Barrowclough *et al.* (2006) using DNA sequences of the RAG-1 exon. Other caprimulgid families were not as readily placed, and the order emerged as paraphyletic in studies using morphology (Livezey and Zusi 2001; Mayr and Clarke 2003) and molecular analyses (Johansson *et al.* 2001, nuclear genes *c-myc* and RAG-1; Chubb 2004, nuclear gene ZENK; Fidler *et al.* 2004, Aanat gene; Cracraft *et al.* 2004, nuclear genes *c-myc*, PEPCK intron 9, RAG-1, RAG-2 and mitochondrial genes cytochrome-*b*, COI, COII, COIII; Barrowclough *et al.* 2006, RAG-1 exon) and using combined morphological-molecular datasets (Mayr *et al.* 2003; Cracraft *et al.* 2004). Ericson *et al.* (2006) found all to be part of the same clade, which also included the Apodiformes – these families formed a polychotomy and relationships among them could not be resolved. Livezey and Zusi (2007) recovered a Caprimulgiformes–Apodiformes clade based on their morphological analyses.

Unlike the classification of Livezey and Zusi (2007), which retained the owlet-nightjars (Aegothelidae) in the Caprimulgiformes, Mayr's (2002) study found that this family was the sister taxon to the Apodiformes rather than being embedded within the caprimulgiforms. This result was also recovered by Mayr *et al.* (2003) using the osteological data combined with more morphological characters, DNA sequences of three nuclear genes and a combined morphological and molecular data set. Cracraft *et al.* (2004), too, recovered this clade in two studies using nuclear genes and one using morphological and molecular data, as did Ericson *et al.* (2006) and Barrowclough *et al.* (2006). Because the clade of the Aegothelidae plus the Apodiformes is well supported by several independent lines of evidence, Sangster (2005b) formally gave it the name Daedalornithes, following the tenets of phylogenetic classification that do not require a designation within the Linnaean taxonomic hierarchy. He chose not to include the Aegothelidae in the Apodiformes because this would change the long-standing concept of that order, as well as requiring a different name for the less inclusive clade comprising the swifts, tree-swifts and hummingbirds. Such an action has its merits, but is not overly suited to the format of a linear sequence such as this one. Here the Aegothelidae are placed with the Apodiformes.

The traditional Apodiformes comprises the Apodidae (swifts), Hemiprocnidae (tree-swifts) and Trochilidae (hummingbirds). The consensus is that the swifts are most closely related to the tree-swifts, which, in turn, are the sister group to the hummingbirds (Trochilidae). Monophyly of this assemblage has received support from a number of studies using different approaches: Kitto and Wilson (1966), malate dehydrogenase; Cracraft (1988), morphology; Sibley and Ahlquist (1990), DNA–DNA hybridisation; Bleiweiss *et al.* (1994), Lee *et al.* (1996) mitochondrial cytochrome-*b* gene; Johansson *et al.* (2001), nuclear genes *c-myc* and RAG-1; Livezey and Zusi (2001), morphology; Mayr (2002), osteology; Mayr *et al.* (2003), morphology and nuclear genes; Chubb (2004), nuclear gene ZENK; Cracraft *et al.* (2004), morphology and nuclear and mitochondrial genes; Ericson *et al.* (2006), nuclear genes; Barrowclough *et al.* (2006), RAG-1 exon.

Fain and Houde (2004) did not resolve the relative positions of the Caprimulgiformes and Apodiformes within the Metaves. In one analysis by Ericson *et al.* (2006), the Caprimulgiformes were monophyletic only if the Apodiformes were included in the order. The possible merger of these as a single order awaits further confirmation.

Coronaves

The remaining Australian families are part of the Coronaves. Three main clades in Coronaves were strongly supported in both Fain and Houde (2004) and Ericson *et al.* (2006): one comprising mainly aquatic and semi-aquatic taxa, another of primarily arboreal and terrestrial forms and a monophyletic charadriiform group. Internal branching patterns within these clades were often not in agreement, or formed parts of unresolved polytomies. In this list, an ordinal sequence has been arranged to maintain the traditional arrangement where it is consistent with the phylogenetic trees in these studies.

Procellariiformes – Sphenisciformes

A relationship between the Procellariiformes (tube-nosed seabirds) and Sphenisciformes (penguins), and these with part or all of the traditional Pelecaniformes, has received support from recent studies. The DNA–DNA hybridisation studies of Sibley and Ahlquist (1990) grouped the tube-nosed seabirds with the penguins and the Fregatidae (frigatebirds). Based on a phylogenetic analysis of available morphological data, Cracraft (1982) merged the Procellariiformes, Sphenisciformes and entire Pelecaniformes (pelicans, cormorants, gannets, tropicbirds, frigatebirds, darters) in a clade that also included the Podicipediformes and Gaviiformes. In a preliminary analysis of osteological characters, Livezey and Zusi (2001) identified a sister relationship between the Procellariiformes and the Sphenisciformes. A sister relationship between these two orders was also supported by analysis of over 4000 base pairs of mitochondrial and nuclear DNA sequences (van Tuinen *et al.* 2001). The studies by Livezey and Zusi (2001) and van Tuinen *et al.* (2001) also associated these two orders with the Gaviiformes. A similar result was obtained by Mayr and Clarke (2003) on the basis of morphological characters. Although some of the analyses shown in Cracraft *et al.* (2004) did not support a close relationship between tube-nosed seabirds and penguins, their summary tree placed these together in a clade that also contained the loons. Ericson *et al.* (2006) associated members of the Procellariiformes with the Sphenisciformes as members of a more inclusive, but internally unresolved, clade that also included the Gaviiformes, Ciconiiformes (such as storks, herons and ibis) and Pelecaniformes. A largely similar grouping was also obtained by Fain and Houde (2004). The Procellariiformes and Sphenisciformes are here maintained as separate orders.

Mayr (2005a) forwarded a novel interpretation of penguin relationships based on the morphology of early fossil penguins and its similarity to that of another fossil group – the extinct Plotopteridae – known only from the Northern Hemisphere. Like penguins, the plotopterids were diving birds with wings modified as flippers. There has been almost universal agreement that the Plotopteridae were closely related to the Suloidea (Sulidae, Phalacrocoracidae, Anhingidae and Pelecaniformes). Mayr proposed that the osteological similarities between early penguins and plotopterids, long considered to be due to convergence, were in fact evidence of a relationship between these groups. That the skeletal morphology of juvenile living penguins resembles that of plotopterids is suggestive of neoteny in the latter group. While a sphenisciform–pelecaniform sister relationship has not received strong support to date, the possibility warrants further attention.

Pelecaniformes – Ciconiiformes

Whether the totipalmate foot and gular pouch (Phaethontidae excepted for the latter) in the families traditionally placed in the Pelecaniformes indicate their monophyly or result from convergence is not clear. Cracraft (1985), using an extensive set of morphological and behavioural data, concluded that the Pelecaniformes were a natural assemblage. Olson (1985a) also suggested that the Pelecaniformes were monophyletic. This was not supported by DNA–DNA hybridisation results of Sibley and Ahlquist (1990), who concluded that the Fregatidae are closer to the conventional Procellariiformes, Sphenisciformes and Gaviiformes; the Phalacrocoracidae (cormorants), Anhingidae (darters) and Sulidae (boobies) are closely related to one another, but not the other 'pelecaniform' families; and the tropicbirds and Pelecanidae (pelicans) have no obvious affinities with each other or any other family. In a study on sclerical ossicles, Warheit *et al.* (1989) could not distinguish between pelecaniform monophyly or polyphyly.

A cormorant–darter–gannet clade has been accepted by most authors. Several studies incorporated in Cracraft *et al.* (2004) found that the frigatebirds were the sister group of this cluster, as did Fain and Houde (2004) and Ericson *et al.* (2006).

DNA sequence data from both mitochondrial (Hedges and Sibley 1994; Siegel- Causey 1997) and nuclear genes (van Tuinen *et al.* 2001; Fain and Houde 2004; Ericson *et al.* 2006) supported a sister relationship between the Pelecanidae and the Balaenicipitidae (*Balaeniceps rex*; Shoebill) indicated by DNA–DNA hybridisation data (Sibley and Ahlquist 1990). Cracraft *et al.* (2004) corroborated this relationship and also associated them with the Scopidae (*Scopus umbretta*; Hammerkop). This grouping, in turn, was sometimes allied with the Threskiornithidae (ibises, spoonbills) and, to a lesser extent, the Ciconiidae (storks) and/or the Ardeidae (herons, egrets, bitterns).

Traditional treatments of the order Ciconiiformes (e.g. Peters 1931; Wetmore 1960; del Hoyo *et al.* 1992) have included the following families: Ardeidae, Scopidae, Balaenicipitidae, Ciconiidae and Threskiornithidae. Nevertheless, there has been considerable debate whether this constitutes a natural grouping (e.g. Saiff 1978; Olson

1979a, 1985a; Cracraft 1986, 1988). (The flamingos have sometimes been included in the Ciconiiformes, but they have now been shown to be part of the Metaves.) The DNA–DNA hybridisation studies of Sibley and Ahlquist (1990) indicated that these were part of a larger assemblage that also included the flamingos, tube-nosed seabirds, penguins and loons, together with the pelicans and Cathartidae (New World vultures). These authors concluded that the last two families were most closely allied to the Balaenicipitidae and Ciconiidae, respectively.

The possibility of a close relationship between the pelicans and *Balaeniceps* was discussed above. These two lineages are part of a strongly supported group that includes the Scopidae, Threskiornithidae and Ardeidae (van Tuinen *et al.* 2001; Ericson *et al.* 2006).

There is strong evidence from these and other studies that the herons and ibis group together while the pelicans are linked to the Shoebill and Hammerkop. It should be noted that molecular evidence for association of the storks with the other families of the conventional Ciconiiformes is far from compelling. Segregation of the storks in a different order would require a name change for the assemblage of the other taxa. Ericson *et al.* (2006) found the storks in a polychotomy comprising the other 'ciconiiform' families plus pelicans, other 'pelecaniforms', tube-nosed seabirds, penguins and loons. Livezey and Zusi (2007) recognised the Balaenicipitiformes as the sister taxon to the conventional Pelecaniformes.

A New World vulture–stork relationship has been suggested by a number of authors on anatomical and behavioural grounds (e.g. Ligon 1967). This has received support from some molecular studies (e.g. Sibley and Ahlquist 1990; Avise *et al.* 1994a). Others, however, have found only weak, or even strongly contradictory, evidence of such a connection (Hedges and Sibley 1994; Seibold and Helbig 1995; Livezey and Zusi 2001; Mayr and Clarke 2003; Cracraft *et al.* 2004; Fain and Houde 2004; Ericson *et al.* 2006). Likewise, support for a position of the Cathartidae in the Falconiformes is not consistent among studies (see below).

Clearly the compositions and inter-relationships between components of the Pelecaniformes (*sensu stricto*) and Ciconiiformes (*sensu stricto*) are far from resolved, as are the relationships between these orders themselves. There is not yet enough evidence to segregate the storks from the other 'ciconiiform' birds. The altered view of the relationships of the pelicans is well supported, although how these should be best expressed is problematic. One alternative is to shift the pelicans from the Pelecaniformes to the Ciconiiformes. This would necessitate a name change for the order comprising the remaining 'pelecaniform' birds. Another approach would be to merge the two orders. A third would separate the pelican-Shoebill-Hammer-kop clade at ordinal level. Faced with such divergent views, a conservative approach is adopted. The minimal alteration is made that reflects the relationships of the Pelecanidae by shifting this family to the Ciconiiformes. That ordinal name is retained. As a result of this action, the name Pelecaniformes must be replaced. Because the cormorants are by far the most speciose of the remaining groups, the Phalacrocoracidae are chosen as the type family, yielding the ordinal name Phalacrocoraciformes.

Falconiformes – Accipitriformes

The composition of the Falconiformes and the relationships of its component groups to each other and to other orders remain controversial. Traditionally, the diurnal birds of prey have been considered to comprise the Cathartidae (New World vultures), Sagittariidae (Secretarybird), Falconidae (falcons) and Accipitridae (hawks and eagles), with the Osprey placed either in its own family (Pandionidae) or as a subfamily in the Accipitridae. The first two families have no representatives in Australia, so are not of direct concern here; nevertheless, they have bearing on discerning the relationships of the remaining Falconiformes to other groups of birds.

Whether the Cathartidae belong with the other families or are more closely related to the storks remains unresolved; studies both support its association with the Falconiformes and its removal to the Ciconiiformes (e.g. Sibley and Ahlquist 1990; Hedges and Sibley 1994; Avise *et al.* 1994a, 1995, Seibold and Helbig 1995; Cracraft *et al.* 2004). Likewise, whether the Secretarybird should be included in the same order as the hawks and falcons has not been confidently resolved.

The traditional relationship between the Accipitridae and Falconidae in a monophyletic Falconiformes was accepted by Christidis and Boles (1994). This was supported by Livezey and Zusi (2007), but challenged by other authors (e.g. Fain and Houde 2004; Ericson *et al.* 2006), although they could not consistently resolve the placement of these families. The falcons were associated with different families, Fain and Houde (2004) placing them near the Coliidae (mousebirds, Africa) and Ericson *et al.* (2006) recovering them in a clade with parrots, passerines and the Cariamidae (seriemas, South America).

Livezey and Zusi (2007), while retaining the Falconidae and Accipitridae in the Falconiformes, placed the Pandionidae with the falcons as a sister family in separate superfamily from the Accipitridae.

Ferguson-Lees *et al.* (2001) split the conventional Falconiformes into several orders: Pandionidae and Accipitridae were placed in the Accipitriformes, Falconidae in the Falconiformes and Sagittariidae into the Sagittariiformes; and the Cathartidae were transferred to the Ciconiiformes. In comparing the complete mitochondrial genomes of *Buteo buteo* (Common Buzzard) and *Falco peregrinus* (Peregrine Falcon), Haring *et al.* (2001) concluded that the Accipitridae and Falconidae diverged 65 to 83 million years ago, which is suggestive of ordinal separation.

The placement of Cathartidae is one of the more intractable problems in avian systematics. Conclusions among studies are often inconsistent, but recent molecular work shows no support for a relationship between New World vultures and storks. It remains to be settled to what other taxon the former group is most closely allied.

There is no consensus about which order is closest to the Falconiformes and usually no obvious candidate has been identified. Sibley and Ahlquist (1990) proposed a close association between the Falconiformes and several traditional 'waterbird' orders. While DNA sequence studies have not explicitly examined the relationships of the Falconiformes to the 'waterbird' assemblage, the limited results do not imply a close relationship between the two groups (Hedges and Sibley 1994; Cracraft *et al.* 2004).

Another relationship that has been forwarded is one between the Falconiformes and the Strigiformes (owls). Although this was frequently suggested during the 19th century, it was later considered that resemblances were convergent owing to similar demands of predatory lifestyles. An owl–hawk association was revived by Cracraft (1981, 1988: morphology) and has received support from McKitrick (1991: hindlimb myology), Mayr and Clarke (2003: osteology), Cracraft *et al.* (2004: molecular analyses) and Livezey and Zusi (2007: morphology). Mayr (2005b) interpreted an Eocene fossil as providing a morphological link between these orders. A close association between these groups was not indicated by the findings of Fain and Houde (2004) or Ericson *et al.* (2006).

All the members of the conventional Falconiformes are in the Coronaves, but the falcons are separate from the remaining diurnal birds of prey. These are recognised here as the Falconiformes (falcons) and Accipitriformes (hawks and eagles, Osprey, Secretarybird).

Gruiformes – Turniciformes – Charadriiformes

The Gruiformes are 'notoriously heterogenous' (Livezey and Zusi 2001). Peters (1934) and Wetmore (1960) placed 12 extant families in this order: Turnicidae (button-quail), Pedionomidae (Plains-wanderer), Mesitornithidae (mesites), Heliornithidae (finfoots), Eurypygidae (Sunbittern), Cariamidae (seriemas), Rhynochetidae (Kagu), Psophiidae (trumpeters), Aramidae (Limpkin), Gruidae (cranes), Rallidae (rails) and Otididae (bustards). Only the first two and last three families occur in Australia. Sibley and Monroe (1990) transferred the Pedionomidae to the Charadriiformes and segregated the Turnicidae into their own order, the Turniciformes (see below).

Olson and Steadman (1981) also placed the Pedionomidae among the Charadriiformes based on osteological analyses, and most authors have accepted this placement (e.g. Marchant and Higgins 1993; Christidis and Boles 1994; del Hoyo *et al.* 1996; Dickinson 2003). Livezey (1998) returned the Pedionomidae and Turnicidae to the Gruiformes, in the same suborder.

Houde *et al.* (1997) examined relationships within the Gruiformes using DNA sequence data of the mitochondrial 12S ribosomal gene from representatives from 11 of the 12 extant families recognised by Peters (1934) and Wetmore (1960); the Pedionomidae were not included. Monophyly of the Gruiformes relative to the Charadriiformes could not be demonstrated. The Otididae, Mesitornithidae and Cariamidae appeared to be more closely aligned with the Charadriiformes, while the Rhynochetidae and Eurypygidae occupied a basal position relative to the gruiform–charadriiform assemblage. The Turnicidae were also linked to this assemblage. In their DNA–DNA hybridisation study, Sibley *et al.* (1993) were also unable to consistently separate Gruiformes from Charadriiformes, nor could Livezey and Zusi (2001) from a preliminary analysis of 359 cranial and vertebral characters. Sibley *et al.* (1993) suggested that the two groups could be treated as adjacent suborders in the same order. Woodbury (2004) found that Otididae and Eurypygidae had double dorsal horns of spinal grey matter, whereas other gruiforms examined had single horns. Fain and Houde (2004) recovered a polyphyletic Gruiformes with families in both the Metaves and Coronaves; the latter contained the traditional rail–finfoot–trumpeter–limpkin–crane core (see also Fain *et al.* 2007), as well as seriemas and bustards, which were each placed apart from this and from each other.

According to the results of Fain and Houde (2004) and Ericson *et al.* (2006), the conventional Gruiformes appear in five locations within the Neoaves. Two small clades, the mesites and the Kagu plus Sunbittern, are included in the Metaves. It is uncertain whether these are sister groups. Within the Coronaves, the 'core' Gruiformes (cranes and Limpkin, rails and finfoots, trumpeter) form a clade, with the bustards and seriemas each comprising smaller ones. All are well separated from each other. In the Australian context, the only relevant groups are the cranes and rails from the core group and the bustards. The former retain the name Gruiformes. It is less certain how to treat the bustards. They do not obviously align with a particular member of the Coronaves, but are one of several lineages that form a polychotomy. While a case might be made for separating the bustards at ordinal level (Otidiformes), because the core Gruiformes are also part of the unresolved polychotomy, the potential of a sister relationship with the Otididae cannot be ruled out on the basis of current information. Consequently, a conservative approach is adopted here to retain the bustards as part of the Gruiformes until more data are available.

Livezey and Zusi (2007) subdivided the Gruiformes by segregating the rails and Sunbittern, each at family level, within the Ralliformes. The mesites were included with the button-quail in the Turniciformes. Remaining members of the Gruiformes were retained in that order.

Sibley and Ahlquist (1990) concluded that the Turnicidae were the sister taxon of, and very distinct from, all other living neognath birds, with no close relatives, and should be segregated at ordinal level. Marchant and Higgins (1993), Christidis and Boles (1994) and Inskipp *et al.* (1996) followed this action, whereas del Hoyo *et al.* (1996) maintained the family in the Gruiformes. While Mindell *et al.* (1997) inferred this group to be distinctive with no close affinities to other higher taxa, they found that it was not outside the other neognaths. Morphological studies by Livezey (1998) and Rotthowe and Starck (1998) and molecular analysis by Houde *et al.* (1997) concluded that the Turnicidae were part of the Gruiformes, although its proposed closest relative was not consistent. Livezey and Zusi (2007) placed this family and the Mesitornithidae in their own order. In contrast, Paton *et al.* (2003) placed the buttonquail in the Charadriiformes as an early diverging lineage in the Lari (gulls, terns, skuas, auks, pratincoles) based on the nuclear gene RAG-1. This position was supported by DNA sequences from another nuclear gene *c-myc*, including the shared possession with Charadriiformes of a unique indel (Cracraft *et al.* 2004), and by the studies of Fain and Houde (2004, 2007), Ericson *et al.* (2006) and Baker *et al.* (2007). Here the Turnicidae are included in the Charadriiformes and placed before the gulls in a position consistent with being the sister group of the remaining Lari.

A number of families within the Gruiformes are not found in Australia and so do not directly affect the circumscription and sequence here. For the present, those as accepted by Christidis and Boles (1994) are retained except for the placement of the Turnicidae in the Charadriiformes. In contrast to the Gruiformes, the Charadriiformes are consistently shown to be a monophyletic unit (e.g. Cracraft *et al.* 2004; Fain and Houde 2004, 2007; Ericson *et al.* 2006). Relationships between these orders are far less clear. Livezey and Zusi (2007) associated the Gruiformes, Turniciformes, Ralliformes and Charadriiformes in the same superorder.

Psittaciformes

While the psittacine birds (cockatoos, lorikeets, parrots) undoubtedly form a monophyletic group, their nearest relatives among living birds remain unidentified, although historically several different orders have been suggested. A sister group relationship between Psittaciformes and Coliiformes (mousebirds), which share a unique form of the tendon of *musculus extensor digitorum longus*, was proposed by Berman and Raikow (1982) and also subsequently recovered in the analysis of McKitrick (1991). Ericson *et al.* (2006) identified a novel clade consisting of the parrots, passerines, falcons and seriamas.

Cuculiformes

The Cuculiformes traditionally comprised two families: the cosmopolitan Cuculidae (cuckoos, coucals, couas, anis and allies) and African Musophagidae (turacos) (Peters 1940; Mayr and Amadon 1951; Wetmore 1960). The DNA–DNA hybridisation studies of Sibley and Ahlquist (1990) indicated that the latter should be removed from the Cuculiformes and placed in a separate order Musophagiformes. The segregation of these families in different orders has since received support from Livezey and Zusi (2001), Mayr *et al.* (2003), Cracraft *et al.* (2004) and Fain and Houde (2004). Mayr and Ericson (2004) presented morphological and molecular evidence suggesting a sister group relationship between the cuckoos and Mesitornithidae (mesites) of Madagascar.

The enigmatic *Opisthocomus hoazin* (Hoatzin) of South America has long defied an assured taxonomic place, but was often included in the Galliformes (e.g. Peters 1934; Mayr and Amadon 1951; Wetmore 1960; Cracraft 1981). On the basis of DNA–DNA hybridisation data, Sibley and Ahlquist (1990) thought it belonged in the Cuculidae, within the New World cuckoo radiation, where it was also placed by Sibley and Monroe (1990). A number of subsequent authors have addressed this question of its relationships with both molecular and morphology investigations, but without confidently resolving its affinities. Some have found evidence of a position among the cuckoos (Hedges *et al.* 1995; Mindell *et al.* 1997), or a closer relationship to the turacos (Hughes and Baker 1999, Hughes 2000; Korzun *et al.* 2003), or could not find any well-supported relationships (Avise *et al.* 1994b; Veron and Winney 2000; Sorenson *et al.* (2003). Fain and Houde (2004) and Ericson *et al.* (2006)

recovered *Opisthocomus* in the Metaves. Similarities with the Cariamidae (seriemas) have been suggested (Olson 1985a, 1992; Mourer-Chauviré 1983; Mayr and Clarke 2003). The emerging picture from the available data is that the circumscription of the Cuculiformes should be confined to the cuckoos and allies, and excluding the Hoatzin and the Musophagidae (but see Livezey and Zusi (2007), who placed the Opistocomiformes as sister taxon to a Cuculiformes comprising the Cuculidae and Musophagidae).

Strigiformes

The phylogenetic affinities of the Strigiformes (owls) are still unclear. On the basis of a cladistic analysis of morphological characters, Cracraft (1981) aligned the Strigiformes with the Falconiformes, whereas Sibley and Ahlquist (1990) and Bleiweiss *et al.* (1994), using DNA–DNA hybridisation data, obtained a close association between Strigiformes and Caprimulgiformes (nightjars and allies). Sibley and Monroe (1990) combined the Strigiformes and Caprimulgiformes as a single order – a treatment followed by Inskipp *et al.* (1996), but not by Andrew (1992), Christidis and Boles (1994) or del Hoyo *et al.* (1999). Livezey and Zusi (2001) found an association between owls, nightjars and apodiforms based on cranial morphology. Cracraft *et al.* (2004) could not find a relationship between strigiforms and any caprimulgiform group. Fidler *et al.* (2004) analysed the relationship between owls and nightjars using the arylalkylamine N-acetyltransferase (Aanat) gene, which is thought to be potentially associated with the evolution of avian dark-activity. They concluded that similarities in nocturnal activity behaviour in these orders were convergent.

In their analyses based on 859 base pairs of the mitochondrial 12S ribosomal gene (12S RNA), Mindell *et al.* (1997) obtained a weak association between *Falco peregrinus* (Peregrine Falcon) and *Tyto alba* (Barn Owl), but there was no obvious association between the other Strigiformes examined and either the Falconiformes or Caprimulgiformes. In a study of the cytochrome-*b* gene, Wink and Heidrich (1999) also obtained inconclusive results on the affinities of the owls; again there was no support for an association between them and either the falconiforms or the nightjars. Using morphological characters, Mayr and Clarke (2003) recovered a strigiform–falconiform alliance. Fidler *et al.* (2004) concluded that their Aanat data supported a sister group relationship between the Falconiformes and Strigiformes. Other molecular studies (Fain and Houde 2004; Ericson *et al.* 2006) did not support such an association.

The relationships of the Strigiformes to other orders remain unresolved. Further work is clearly required.

Coraciiformes

There is increasing evidence that the Coraciiformes (*sensu* Wetmore 1960) is not a natural monophyletic assemblage as conventionally accepted. Sibley *et al.* (1988) divided the conventional Coraciiformes into three orders: Bucerotiformes (hornbills), Upupiformes (hoopoes, wood-hoopoes) and Coraciiformes (kingfishers, rollers, bee-eaters, motmots, todies). Recognition of a clade comprising the hornbills, hoopoes and wood-hoopoes has been gaining support (e.g. Mayr 1998; Johansson *et al.* 2001; Cracraft *et al.* 2004; Ericson *et al.* 2006), with it increasingly being segregated as the Bucerotiformes. There is also support for a clade comprising the kingfishers (Alcedinidae, Halcyonidae, Cerylidae) and motmots (Momotidae), sometimes with a connection between these and the rollers (Coraciidae) or the bee-eaters (Meropidae) (Maurer and Raikow 1981; Burton 1984; Johansson *et al.* 2001; Cracraft *et al.* 2004).

The possibility has been forwarded that some 'coraciiform' families may be closer to members of the traditional Piciformes (woodpeckers and allies) (e.g. Fain and Houde 2004; Ericson *et al.* 2006). A clade of the Coraciiformes, Piciformes and Trogonidae (trogons) was identified by Ericson *et al.* (2006). Monophyly of the latter order is also debated.

Two main clades have been identified in what are generally regarded as the Piciformes – one comprising Pici (woodpeckers, honeyguides, barbets, toucans), the other the Galbulae (jacamars, puffbirds).

Passeriformes

It is generally agreed that the Passeriformes are a natural assemblage (e.g. Raikow 1982). Similar agreement is lacking in respect to this order's closest relatives. The most frequently nominated groups are the Coraciiformes, Piciformes and/or (less often) Cuculiformes or Psittaciformes (e.g. Shufeldt 1900; Mayr and Amadon 1951; Fain and Houde 2004; Höfling and Alvarenga 2001; Mayr and Clarke 2003; Livezey and Zusi 2001; Cracraft *et al.* 2004; reviewed by Sibley and Ahlquist 1990). The nuclear gene sequences of Ericson *et al.* (2006) placed the Passeriformes in a clade with the parrots, falcons and South American seriemas.

Systematics and taxonomy of Australian birds

PALAEOGNATHAE

ORDER STRUTHIONIFORMES

Family Struthionidae

The introduced *Struthio camelus* (Ostrich) occurs, or has occurred, in Australia. This was regarded as being represented by subspecies *australis* Gurney, 1868 from southern Africa (Condon 1975). Sequences of the mitochondrial control region indicate that this form is closest to the eastern African population *massaicus* Neumann, 1898 (Robinson and Matthee 1999). It is possible that Australian birds are now extinct as a wild population and thus the species should be transferred to the supplementary list.

No changes have been made from Christidis and Boles (1994).

Struthio camelus	Ostrich$^{I/E?}$

ORDER CASUARIIFORMES

Family Casuariidae

Christidis and Boles (1994) treated the Dromaiidae and Casuariidae as subfamilies within a single family, following the osteological studies by Patterson and Rich (1987). Livezey and Zusi (2007) retained these as separate families. One family is recognised here, with Casuariidae Kaup, 1847, having priority over Dromaiidae Huxley, 1868. This action is supported by DNA–DNA hybridisation (Sibley and Ahlquist 1981) and 12S RNA sequence (Cooper *et al.* 1992). The latter study showed that the divergence between the two is no greater than that between the species of kiwi *Apteryx*. Lee *et al.* (1997) and Cracraft *et al.* (2004) used the family name Dromiceidae [sic] for the emus. Dromaiidae Huxley, 1868, has priority over Dromiceiidae Richmond, 1908 (Bock 1994) – note the correct formation of the latter. *Dromiceius* and *Dromaius* appeared in the same publication by Vieillot (1816); the former name has page priority (p. 54 versus p. 70), but was regarded by Serventy *et al.* (1965) to be a misprint and that it should be rejected as an incorrect original spelling.

Parker (1984) demonstrated that the dwarf emus of Kangaroo Island and King Island were morphologically distinct and should be regarded as separate species, taking the names *Dromaius baudinianus* S.A. Parker, 1984, and *D. ater* Vieillot, 1817, respectively. The taxonomic level at which the now extinct Tasmanian population (*diemenensis*) should be recognised has yet to be resolved (see

Patterson and Rich 1987); until the question is investigated further, this form has been retained in *D. novaehollandiae* (Emu)

Casuarius casuarius	Southern Cassowary
Dromaius novaehollandiae	Emu
Dromaius ater	King Island Emu^E
Dromaius baudinianus	Kangaroo Island Emu^E

NEOGNATHAE

Galloanseres

ORDER GALLIFORMES

Australia has three native species each of megapodes and quail, but there are a number of other galliform species kept either in a domestic state or in aviaries that have become established in a feral state, or have the potential to do so.

Sibley *et al*. (1988), Sibley and Ahlquist (1990) and Sibley and Monroe (1990; see errata in Sibley and Monroe 1993) placed the megapodes (Megapodiidae) and the Neotropical currasows, guans and chachalacas (Cracidae) together in the order Craciformes as the sister clade to the remaining taxa (sometimes collectively called the typical galliforms or phasianoids). Subsequent authors have not adopted this division. The distinctiveness of the megapodes and cracids is evident, but subsequent authors, using morphological and molecular techniques, have found that these do not form a clade separate from the phasianoids. Instead, the Megapodiidae and Cracidae are successive sister groups to the phasianoids – an arrangement that has gained consensus among most workers (e.g. Cracraft 1973, 1981; Johnsgard 1986; Brom and Dekker 1992; Harshman 1994; del Hoyo 1994; Livezey and Zusi 2001; Mayr 2000; Dimcheff *et al*. 2000, 2002; Madge and McGowan 2002; Dyke and Gulas 2002; Dyke 2003; Dyke *et al*. 2003; Dickinson 2003; Cracraft *et al*. 2004; Pereira and Baker 2006; Crowe *et al*. 2006).

Within the phasianoids, there are several major divisions: guineafowl, New World quail, Old World quail, turkeys, grouse, francolins, spurfowl, peafowl and several groups of partridges and pheasants. While these have been identified in most broad studies, there is less concordance about their inter-relationships and taxonomic rankings, with groups being variously treated as families, subfamilies or tribes. For example, Johnsgard (1986, 1988), del Hoyo *et al*. (1994) and Madge and McGowan (2002) accepted five families and Dickinson (2003) accepted three.

Sibley *et al*. (1988) identified three major lineages in the typical Galliformes: Numididae (guineafowls), Odontophoridae (New World quails) and Phasianidae (grouse, pheasants, partridges, turkeys, Old World quails). Helm-Bychowski and Wilson (1986) analysed 161 restriction sites in the nuclear DNA of *Gallus*, *Alectoris*, *Meleagris*, *Phasianus*, *Pavo* and *Numida* and concluded that of these genera, *Numida* was the most divergent lineage and most appropriately placed in its own family. Turbott (1990) and AOU (1998), however, retained the guineafowl as a subfamily in the Phasianidae. Recognition of the Odontophoridae at family level is well supported by osteology (Holman 1964; Mourer-Chaviré 1992), biochemistry (Gutierréz *et al*. 1983), mitochondrial and nuclear DNA (e.g. Kornegay *et al*. 1993; Kimball *et al*. 1999; Cracraft *et al*. 2004; Pereira and Baker 2006; Crowe *et al*. 2006), and has been generally accepted in recent publications (e.g. del Hoyo 1994; AOU 1998; Madge and McGowan 2002; Dickinson 2003). Armstrong *et al*. (2001), employing the mitochondrial cytochrome-*b* gene, found the Numididae in a more derived position than the Odontophoridae, whereas the nuclear marker avian ovomucoid intron G produced the reverse result.

Phylogenetic relationships within the Galliformes were studied in depth by Crowe *et al*. (2006) using 4452 base pairs from both mitochondrial and nuclear genes and 102 morphological and behavioural characters. The first phasianoid family to diverge was the Numididae, with the Odontophoridae, as the sister group to all remaining forms, which were placed in the Phasianidae.

Kimball *et al.* (1999) confirmed that the New World quail (Odontophoridae) and guineafowl (Numididae) warranted recognition at family level, and were successive outgroups to the traditional Galliformes, which collectively segregate as the Phasianidae. Using mainly morphological characters, augmented by some behavioural traits, Dyke *et al.* (2002), concluded that the guineafowl were the first family to diverge within the phasianoid lineage, but as a succession of paraphyletic taxa, rather than a monophyletic unit. Whereas these authors included four guineafowl taxa, Kimball *et al.* (1999) had one, and so could not test for this arrangement. Dyke *et al.* (2002) considered the Old World and New World quail and several partridge genera to form a rather derived clade.

Meleagris was previously frequently segregated in its own family (Meleagrididae); (see also Livezey and Zusi 2007). Studies using a variety of morphological (Schnell and Wood 1976) and molecular characters (Sibley and Ahlquist 1990; Helm-Bychowski and Wilson 1986; Randi *et al.* 1991; Kornegay *et al.* 1993; Kimball *et al.* 1999; Pereira and Baker 2006), however, reveal a close relationship between *Meleagris* and the traditional Phasianidae. Turkeys were placed as the sister taxon to the Holarctic grouse (also sometimes given family rank as Tetraonidae) by Kimball *et al.* (1999) and Dimcheff *et al.* (2002), although there is not consistent agreement among other authors regarding the relationships of these groups to each other or to other members of this family. Pereira and Baker (2006) and Crowe *et al.* (2006) recovered the novel pairing of turkeys with *Perdix perdix* (Grey Partridge).

The higher divisions of the Galliformes used in the list and their sequence are those of Crowe *et al.* (2006).

Family Megapodiidae

Clark (1964a, b), using overall similarity of various morphological and proportional characters, discerned a division between the scrubfowl (*Megapodius* [including *Eulipoa*], *Macrocephalon*) and the other taxa (*Alectura*, *Aepypodius*, *Talegalla* and *Leipoa*). Brom and Dekker (1992), basing their study on many of the same characters, but employing cladistic methodology, could not confirm this arrangement. They associated the two brush-turkeys (*Alectura*, *Aepypodius*), while *Talegalla* and *Leipoa* formed a trichotomy with *Megapodius*–*Eulipoa*–*Macrocephalon*. Mey (1997) examined the taxonomy of megapode feather lice to assess that of their host taxa, concluding there was a split between *Megapodius*–*Eulipoa* and *Alectura*–*Aepypodius*. The positions of *Macrocephalon*, *Talegalla* and *Leipoa* were less certain, but appeared aligned with the latter genera. Birks and Edwards (2002), using nuclear and mitochondrial DNA, confirmed a dichotomy between the scrubfowl and the other genera. *Alectura* and *Aepypodius* were sister taxa, but the relative positions of *Talegalla* and *Leipoa* within the latter group were not fully resolved. The sequence used here is derived from the phylogeny of Birks and Edwards (2002).

Megapodius reinwardt (Orange-footed Scrubfowl) is generally regarded as a separate species from *M. freycinet* (Dusky Megapode; e.g.. Schodde 1977; White and Bruce 1986; Sibley and Monroe 1990; Marchant and Higgins 1993; del Hoyo *et al.* 1994; Jones *et al.* 1995; Dickinson 2003). Nevertheless, the taxonomic status of most of the forms within the *Megapodius freycinet* superspecies complex are poorly understood and further detailed work is required

Alectura lathami	Australian Brush-turkey
Leipoa ocellata	Malleefowl
Megapodius reinwardt	Orange-footed Scrubfowl

Family Numididae

Populations of *Numida meleagris* (Helmeted Guineafowl) in Australia were not considered by Marchant and Higgins (1993) to be self sustaining and viable, on which basis Christidis and Boles (1994) placed it on the supplementary list. Britton and Britton (2000) and Wieneke and James (2006) provided evidence that there are low numbers at several locations in northern Queensland where this species has persisted and bred. It has been transferred to the main list.

Numida meleagris	Helmeted Guineafowl[I]

Family Odontophoridae

This family is represented in Australia by the introduced *Callipepla californica* (California Quail). This was previously placed in *Lophortyx* (e.g. Condon 1975), but this genus is now included in *Callipepla* (Holman 1964; Ohmart 1967; Johnsgard 1970, 1973, 1988; AOU 1998; Sibley and Monroe 1990; Christidis and Boles 1994; Madge and McGowan 2002; Dickinson 2003).

Callipepla californica	California Quail[I]

Family Phasianidae

This family is represented in Australia by three native and several feral species. Of the feral species, Christidis and Boles (1994) listed *Phasianus colchicus* (Common Pheasant), *Gallus gallus* (Red Junglefowl), *Pavo cristatus* (Indian Peafowl) and *Meleagris gallopavo* (Wild Turkey). The first three have small persisting populations, mostly on offshore islands, and populations of Wild Turkeys on Bass Strait Islands are now accepted as being feral (see Marchant and Higgins 1993), but were not included in Condon (1975). *Pavo cristatus* is also feral on Kangaroo Island (Baxter 1995). The population of *Gallus varius* (Green Junglefowl) on Cocos (Keeling) Islands was considered not to be self-sustaining and viable (Marchant and Higgins 1993), so the species was included on the supplementary list. It has since been shown that this species survives on West Island, Cocos (Keeling) Islands, where it is common and breeds (Carter 1994b; Johnstone and Darnell 2004b; Hopton 2006; Hadden 2006). Populations of *Alectoris chukar* (Chukar Partridge) in New South Wales were regarded by Marchant and Higgins (1993) as being extinct (no observers are known to have investigated this population, however).

Most studies place turkeys in a basal, or near basal, position relative to the remaining genera. The remaining taxa are sometimes separated into two subfamilies or tribes – one of the partridges, quail and francolins, the other of the pheasants. There are several recognised lineages within the pheasants: gallopheasants (represented in Australia by *Coturnix*, *Phasianus* and *Alectoris*), tragopans and allies (unrepresented), peafowl (*Pavo*) and junglefowl (*Gallus*).

Kimball *et al.* (1999), Armstrong *et al.* (2001) and Dyke *et al.* (2003) showed that neither the partridges nor the pheasants, as conventionally circumscribed, form monophyletic units relative to each other (see also Fumihito *et al.* 1995 and Bush and Strobeck 2003). There was poor resolution of the positions of many genera, and no formal recommendations were made about how to treat these various divisions within the family taxonomically.

Crowe *et al.* (2006) divided the Phasianidae into six subfamilies, falling into two main clades. The first comprised the Aborophilinae – an assemblage of mono- or dispecific African and Asian genera (*Xenoperdix, Rollulus* and *Aborophila*) and the Coturnicinae. The latter included the Old World quail (*Coturnix* and *Excalfactoria*), Madagascan Partridge (*Margaroperdix madagascarensis*), spurfowl (*Pternistes*), partridges (*Alectoris*) and others. The other phasianid clade contained two subclades. One comprised the Pavoninae, with peafowl (*Pavo*) and relatives, and the Gallinae – junglefowl (*Gallus*), bamboo-partridges (*Bambusicola*) and several genera of francolins. The second subgroup included the Meleagridinae, uniting *Meleagris* and Grey Partridge (*Perdix perdix*), as sister group to the Tetraoninae (grouse) and these, in turn, forming a clade with the Phasianinae – the pheasants, including *Phasianus, Chrysolophus and Lophura*.

Maintaining *Synoicus* and *Excalfactoria* as distinct from *Coturnix* had once been the usual treatment (e.g. Peters 1934), but this was replaced by the now common practice of uniting all as *Coturnix* (e.g. Condon 1975, Johnsgard 1988; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Madge and McGowan 2002; Dickinson 2003). Although this grouping is not universally accepted (e.g. Turbott 1990, who retained *Synoicus* for *ypsilophorus*), it is followed here. It was considered that differences in the number of rectrices or ornate plumage of the adult males – the bases on which these genera were recognised previously – were inadequate criteria for separation. Crowe *et al.* (2006) consistently recovered a clade in which *Excalfactoria* had a sister relationship with the pair of *Coturnix* and *Margaroperdix*. There has not been any previous suggestion that *Margaroperdix* and *Coturnix* are congeneric. If these are each kept at generic level, then so too must be *Excalfactoria*. This is done here, with the King Quail becoming *Excalfactoria chinensis*.

Condon (1975) maintained *Coturnix pectoralis* (Stubble Quail) as a distinct species from *C. novaezelandiae* (New Zealand Quail); RAOU (1978b) subsequently merged these without explanation, as did Turbott (1990) and Johnstone and Storr (1998). If such action were accepted, *novaezelandiae* Quoy and Gaimard, 1830, has priority over *pectoralis* Gould, 1837. These forms are morphologically quite distinctive (James 1993a) and are kept separate here – a practice that conforms to the most frequent current usage (e.g. Sibley and Monroe 1990; Madge and McGowan 2002; Dickinson 2003).

The taxonomy of the *Coturnix australis*–*ypsilophora* complex is poorly resolved. Condon (1975) separated both at specific level – his distributions indicating sympatry on the south-eastern mainland, but such overlap has not been confirmed. Furthermore, James (1993a) has shown that, apart from size, the variation between *ypsilophora* (Tasmania) and *australis* (mainland) is little greater than the variation within some mainland populations. They are best combined as moderately marked subspecies (see also Sibley and Monroe 1990), and this is now the conventional treatment; *ypsilophora* Bosc, 1792, has priority over *australis*, Latham, 1802. *Coturnix* is feminine (ICZN 1987), thus the specific epithet should be *ypsilophora*.

Excalfactoria chinensis is the sister species of *E. adansonii* (African Blue Quail) of Sub-Saharan Africa. Some of the populations of *Excalfactoria chinensis* in Victoria may result from introduced birds (Marchant and Higgins 1993).

Here the genera of Phasianidae follow the classification of Crowe *et al.* (2006).

Coturnix pectoralis	Stubble Quail
Coturnix ypsilophora	Brown Quail
Excalfactoria chinensis	King Quail
Alectoris chukar	Chukar Partridge^{S}
Pavo cristatus	Indian Peafowl^{I}
Gallus gallus	Red Junglefowl^{I}
Gallus varius	Green Junglefowl$^{CK/I}$
Phasianus colchicus	Common Pheasant^{I}
Meleagris gallopavo	Wild Turkey^{I}

ORDER ANSERIFORMES

The Anseriformes have been shown to comprise three distinct lineages (Livezey 1986, 1997b; Sibley and Ahlquist 1990): Anhimidae (screamers, South America), Anseranatidae (*Anseranas semipalmata*; Magpie Goose) and Anatidae (remaining species). Sibley and Ahlquist (1990) aligned *Anseranas* with the Anhimidae, whereas Livezey (1986) aligned it more closely with the typical waterfowl. These and other authors (e.g. Woolfenden 1961; Olson and Feduccia 1980a), nevertheless, agreed that *Anseranas* should be recognised at family level, Anseranatidae, as was done in Christidis and Boles (1994) and most subsequent classifications (e.g. Dickinson 2003; Kear 2005; *contra* Carbaneras 1992a).

Family Anseranatidae

This family comprises only the single living species, *Anseranas semipalmata* (Magpie Goose).

Anseranas semipalmata	Magpie Goose

Family Anatidae

Australia has 20 native breeding species of anatids. Several of these are placed in endemic, monotypic genera whose nearest relationships within the family have proved difficult to discern. The affinities of these and other aberrant genera are part of greater disagreements over how the Anatidae should be partitioned into subfamilies and tribes. The traditional classification proposed by Delacour and Mayr (1945), and later modified by Johnsgard (1961, 1968, 1978), recognised the Anserinae for *Dendrocygna* (whistling ducks), *Thalassornis* (*T. leuconotus*, White-backed Duck; Africa), *Cygnus* (swans), *Coscoroba* (*C. coscoroba*, Coscoroba Swan; South America), *Anser* and *Branta* (geese), *Cereopsis* (*C. novaehollandiae*, Cape Barren Goose) and *Stictonetta* (*S. naevosa*, Freckled Duck), and Anatinae for the remaining genera. On the basis of a phylogenetic analysis of 120 morphological characters, Livezey (1986) recognised additional monogeneric subfamilies each for *Dendrocygna*, *Thalassornis*, *Plectropterus* (*P. gambensis*, Spur-winged Goose; Africa) and *Stictonetta*. More recently, Livezey (1995a) included *Thalassornis* in the Dendrocygninae. Within the conventional Anatinae (*sensu* Johnsgard 1961, 1968), Livezey (1986) also separated the Tardoninae and monotypic Plectropterinae as subfamilies. On the basis of DNA–DNA hybridisation data (Sibley and Ahlquist 1990), Sibley and Monroe (1990) united *Dendrocygna* and *Thalassornis* as a family and divided the remaining genera into four subfamilies in the Anatidae: Oxyurinae, Stictonettinae, Cygninae and Anatinae. Of major significance was the separation of *Anser* and *Branta* from *Cygnus* and their inclusion in the Anatinae.

The classification of Carbaneras (1992a) retained *Anseranas* in the Anatidae, segregating it in one of three subfamilies: Anseranatinae, Anserinae and Anatinae. The four tribes in the Anserinae were Dendrocygnini (*Dendrocygna* and *Thalassornis*, whistling ducks), Anserini (*Branta* and *Anser*, geese; *Cygnus*, swans; *Coscoroba*), Cereopsini (*Cereopsis*) and Stictonettini (*Stictonetta*). All remaining taxa were placed in one of eight tribes of the Anatinae. Australian genera and the tribes to which they were allocated are Tadornini (*Tadorna*, shelducks), Cairinini (perching ducks; *Chenonetta jubata*, Australian Wood Duck; *Nettapus*, pygmy-geese), Anatini (*Anas*, dabbling ducks; *Malacorhynchus membranaceus*, Pink-eared Duck), Aythyini (*Aythya*, scaup and pochards), and Oxyurini (*Oxyura*, stiff-tailed ducks; *Biziura lobata*, Musk Duck). The other three tribes (Tachyerini, steamer ducks; Marganettini, torrent ducks; Mergini, sea ducks) are not represented in Australia.

Livezey (1986, 1991, 1995a, b, c; 1996a, b, c; 1997c) undertook a series of morphological analyses of the various subgroups of waterfowl using characters of bill shape, osteology and downy and adult plumage. This work culminated in a classification of all the living anseriform taxa (Livezey 1997b). The subfamilies and tribes (relevant to Australia) he maintained were:

- Dendrocygninae (*Dendrocygna*)
- Anserinae: Cereopsini (*Cereopsis*), Anserini (*Branta*, *Anser*), Cygnini (*Cygnus*)
- Stictonettinae (*Stictonetta*)
- Tadorninae (*Tadorna*)
- Anatinae: Malacorhynchini (*Malacorhynchus*), Anatini (*Anas*, *Chenonetta*, *Nettapus*), Aythyini (*Aythya*), Oxyurini (*Oyxura*, *Biziura lobata*).

Within the Anatini, Livezey (1997b) erected three subtribes: Cairinina (muscovy ducks and allies; non-Australian), Nettapodina (*Chenonetta* and *Nettapus*) and Anatina (*Anas* and other dabbling ducks). His arrangement has received general acceptance, but parts have been shown by molecular studies to require modification. This arrangement serves as a baseline on which to make changes indicated by more recent studies. Most of the major divisions are represented in Australia.

Sraml *et al.*(1996) investigated the relationships of all native Australian genera of waterfowl, based on DNA sequences of a 307-base-pair fragment of the mitochondrial cytochrome-*b* gene. Also included in the study were *Alopochen aegyptiacus* (Egyptian Goose), *Cairina moschata* (Muscovy Duck), *Aix galericulata* (Mandarin Duck) and *Branta canadensis* (Canada Goose). Conclusions from the study were provisional, given the small amount of sequence examined and the low bootstrap values for parts of the phylogeny. *Dendrocygna* was the first lineage to diverge after the Anseranatidae. The remaining genera fell into two clusters: (1) *Tadorna, Alopochen, Chenonetta, Anas, Aythya, Cairina, Aix* and (2) *Cygnus, Branta, Cereopsis, Biziura, Oxyura, Malacorhynchus, Stictonetta* and *Nettapus*. Presumed associations of long standing between some genera were corroborated, while other novel ones were recovered. There was little support for the Anatinae as defined by Livezey (1996a). The Anatini and Aythyini were part of the same clade, but Oxyurini was not. Likewise, a close association between *Cairina, Aix, Chenonetta* and *Nettapus* – conventionally regarded as parts of a perching duck cluster – formed a non-monophyletic grouping relative to other genera. A sister taxa relationship between *Chenonetta* and *Nettapus*, as suggested by Livezey (1991), was at variance with the sequence data. *Chenonetta* grouped with *Tadorna* and *Alopochen*. A clade comprising *Cereopsis* and *Stictonetta* was not expected, nor was one between *Biziura* and *Malacorhynchus*, and this pair with *Cygnus-Branta*. *Oxyura* grouped with the swans and geese, rather than with *Biziura*.

A clade, recognised as a subfamily (Anserinae), containing the geese and swans (as tribes) was recovered by Livezey (1986, 1996b, 1997b), as in conventional classifications. A third tribe comprised *Cereopsis*. *Coscoroba* was placed in the Cygnini. Zimmer *et al.* (1994) could not resolve the position of this genus, finding that it either diverged before the geese and swans or was the sister taxon to the swans.

McCracken *et al.* (1999) investigated the relationships among the stiff-tailed ducks using mitochondrial DNA sequences, comparing *Biziura lobata*, all the members of *Oxyura* and the related monotypic genera *Heteronetta* and *Nomonyx*. Other taxa included in the analysis as outgroups were limited to *Stictonetta*, *Cygnus melanocoryphus* (Anserinae) and *Cairina moschata* (Anatinae). They found that the Oxyurini was not a natural group. *Biziura* was not closely related to the other genera – its similarities being convergent, mainly in the hindlimb of these diving birds. *Biziura* is, instead, either the sister genus to the Anserinae or the Anserinae–Anatinae (among the taxa sampled). The true stiff-tailed ducks are not part of the Anserinae–Anatinae clade, and *Stictonetta* falls outside all the sampled taxa.

Donne-Goussé *et al.* (2002) sequenced DNA from the complete mitochondrial control region and the cytochrome-*b* and ND2 genes to obtain a phylogeny of the Anseriformes. Unfortunately, their study lacked a number of critical Australian taxa (*Anseranas*, *Stictonetta*, *Malacorhynchus*, *Nettapus* and *Biziura*) nor did it have any of the stiff-tailed ducks. Among the taxa in the study, *Dendrocygna* was the first offshoot. The remaining waterfowl sampled formed two clusters corresponding to the Anserinae and Anatinae. Of the five genera grouped as the Anserinae, the geese *Anser* and *Branta* formed a group, as did *Cereopsis* and *Coscoroba*; the latter two were the sister clade to *Cygnus*. Five main lineages were identified in the Anatinae, together with some genera that did not fall within these clades. Donne-Goussé *et al.* (2002) recognised as tribes the Anatini, Aythyini, Cairinini, Mergini and Tadornini – the first two being sister taxa. *Chenonetta* did not form a group with the Cairinini (represented by *Cairina* and *Aix*). It, instead, formed as polychotomy with Cairinini, Anatini–Aythyini and *Marmaronetta angustirostris* (Marbled Teal). In the absence of any member of the *Oxyura*, it was not possible to test the position of the stiff-tailed ducks as recovered by McCracken *et al.* (1999).

Chenonetta and *Nettapus* were traditionally placed among the perching ducks, Cairinini (e.g. Johnsgard 1968). In his morphological analysis, Livezey (1986) demonstrated that this was in fact a polyphyletic assemblage, but retained *Chenonetta–Nettapus* near a restricted Cairinini as a closely related lineage. Sraml *et al.* (1996) recovered *Chenonetta* as a sister genus to a tadornine clade of *Tadorna-Alopochen*. The study of Johnson and Sorenson (1999) focused on relationships within *Anas* and allied genera, and thus the resulting trees cannot be used to resolve relationships between *Anas* and those genera used as outgroups. Among those outgroups, *Chenonetta* did not group with *Cairina–Aix*. The extinct *Euryanas finschi* (Finsch's Duck) of New Zealand was placed as a monotypic tribe in the Tadornini by Livezey (1989, 1997b,c), but is now considered to be a flightless derivative of *Chenonetta* and should be placed in that genus (Worthy and Olson 2002). *Malacorhynchus* was placed in the Tadorninae by Livezey (1986), in contrast with the action of most authors who included it in the Anatinae (summarised by Christidis and Boles 1994).

The relationships of several monotypic Australian genera remain poorly understood. *Stictonetta* has been variously associated with the Anatinae (Delacour and Mayr 1945), Anserinae (Frith 1964; Johnsgard 1968), Oxyurini (Fullagar *et al.* 1990), or in its own subfamily Stictonettinae (Livezey 1986; Sibley and Monroe 1990). It has no obvious relationship with any other living group of waterfowl, so is best maintained in its own subfamily. *Cereopsis* has also been associated with the Tadornini (Delacour and Mayr 1945), but is now generally included in the Anserinae – often in a monotypic tribe (Johnsgard 1968; Livezey 1986, 1996b, 1997b; Kear 2005). A sister relationship with *Coscoroba* among living taxa was proposed by Harshman (1996), Harvey (1999), Donne-Goussé *et al.* (2002) and St John *et al.* (2005). A closer relative may be the extinct Pleistocene genus *Cnemiornis* (New Zealand geese) (Worthy *et al.* 1997; Worthy and Holdaway 2002; *contra* Livezey 1989, 1997b, Kear 2005). Although *Biziura* was placed with the Oxyurini on morphological and behavioural grounds (e.g. Livezey 1986, 1995b, 1997b; Marchant and Higgins 1990), this apparent relationship has been shown to be convergent.

While there are still areas of disagreement among these studies, some major aspects are well supported. The placement of some genera is as much a matter of convenience as it is a confident reflection of current knowledge. The Dendrocygninae start the linear sequence. The positions of *Stictonetta* and *Biziura* are uncertain and placing them after the whistling-ducks is a largely pragmatic decision that does not imply a relationship between these genera or with the Anserinae, which follow. *Malacorhynchus, Chenonetta and Nettapus* are placed between the Tadornini and the Anatini without conviction. *Aythya* follows *Anas*. The Oxyurini conclude the sequence, but the exact position of the stiff-tails awaits further study.

The Dendrocygninae have three Australian representatives, *D. eytoni* (Plumed Whistling-Duck), *Dendrocygna arcuata* (Wandering Whistling-Duck) and *D. guttata* (Spotted Whistling-Duck). The last was only recently confirmed as a breeding species (Gould and Barrett 2005; see also Niland (1996) and Beruldsen (2002). Livezey (1995a) placed *Dendrocygna arcuata* and *D. eytoni* in a clade with *D. bicolor* (Fulvous Whistling-Duck) and *D. javanica* (Lesser Whistling-Duck); *arcuata* and *javanica* are sister species. *D. guttata* forms a sister pair with *D. arborea* (West Indian Whistling-Duck).

The non-overlapping regional differences in vocalisations between south-eastern and south-western *Biziura lobata*, possibly with a genetic basis (McCracken *et al.* 2002), warrant further investigation into the relationships between these allopatric populations.

Australian members of the Anserinae are *Cereopsis novaehollandiae*, the self-introduced vagrant *Branta canadensis*, introduced *Cygnus olor* (Mute Swan) and native *Cygnus atratus* (Black Swan). The swans (*Cygnus*) can be divided into three subgenera (Livezey 1996b). The two subgenera of white swans are sometimes each elevated to generic level. The introduced C. *olor* is in the nominate subgenus. *Cygnus atratus* groups with other southern species, C. *melanocoryphus* (Black-necked Swan; South America).

Branta canadensis was listed in Christidis and Boles (1994) as a vagrant to Lord Howe Island from the introduced populations of New Zealand (McAllan *et al.* 2004). Records of an individual subsequently reported from the mainland Australia (Shoalhaven and Comorong Island, NSW) were accepted (Carter 2006; BARC 401). Recent work (e.g. Scribner *et al.* 2003) on the Canada Goose in its northern range has led to its division into two species, *B. canadensis* and *B. hutchinsii* (Cackling Goose) (Banks *et al.* 2004). Birds introduced to New Zealand are regarded as representing the subspecies *B. canadensis maxima* (Marchant and Higgins 1990). Individuals of domestic geese (*Anser* species) occur in semi-feral states in some parks, but at this stage established self-sustaining populations have not been reported.

There are two breeding species of shelducks – *Tadorna tadornoides* (Australian Shelduck) and *T. radjah* (Radjah Shelduck) – and one vagrant, *T. variegata* (Paradise Shelduck). Livezey (1997b) divided the genus *Tadorna* as conventionally treated into *Tadorna* and *Casarca*, with *radjah* in the former and *tadornoides* and *variegata* in the latter. This division has received little acceptance by recent authors.

Aythya is represented in Australia only by *A. australis* (Hardhead). Livezey (1996c) divided the genus into three subgenera, including *A. australis* with *A. innotata* (Madagascan Pochard), *A. nyroca* (Ferruginous Duck) and *A. baeri* (Baer's Pochard).

Johnson and Sorenson (1998, 1999) studied the relationships within the Anatini (excluding the perching ducks) using 1047 base pairs of cytochrome-*b* and 1041 of the mitochondrial ND2 gene. Their results differed in several points from the phylogeny of Livezey (1991, 1997b), but these do not affect any Australian species. They recovered four main lineages:

(1) a group of South American genera (*Amazonetta*, *Lophonetta*, *Speculanas*, *Tachyeres*)
(2) *Anas formosa* (Baikal Teal)
(3) the blue-winged ducks, including the shovelers and Blue-winged Teal (*A. discors*; North America)
(4) a large assemblage of the remaining species.

The last includes several subgroups, including the mallards and allies, pintails, wigeons and grey, brown and green-winged teals.

In the phylogeny of dabbling ducks (Johnson and Sorenson 1998, 1999), lineages 1, 2, and 3 constitute one large clade and lineage 4 a second. As currently delimited, *Anas* constitutes a paraphyletic genus. It could either be restricted to those species constituting lineage 4 or else include all species in lineages 1 through 4. In the former alternative, lineages 1, 2 and 3 could be combined as a single genus (for which the name *Spatula* Boie, 1822, is the oldest) or else each kept as a separate genus.

One of the surprise findings by Johnson and Sorenson (1999) was the inclusion of *Tachyeres* (steamer-ducks) in the Anatini, rather than as part of the tadornine assemblage, where it had been placed by Livezey (1996a, 1997b). *Lophonetta* and *Speculanas* were resurrected by Livezey (1996a, 1997b); they were retained in *Anas* by Johnsgard (1968). *Tachyeres* Owen, 1875 is the senior name if this group were segregated generically. No available generic name exists for *A. formosa* (lineage 2) and a new one would need to be erected. The name *Spatula* would apply to lineage 3. The species in lineage 2 and 3 cannot be included in *Anas* if separate genera are recognised in lineage 1.

The dabbling ducks are represented in Australia by the widespread genus *Anas*, with a range of native breeding species (*A. superciliosus*, Pacific Black Duck; *A. rhynchotis*, Australasian Shoveler; *A. castanea*, Chestnut Teal; *A. gracilis*, Grey Teal), vagrants and rare visitors (*A. acuta*, Northern Pintail; *A. querquedula*, Garganey) and introduced species (*A. platyrhynchos*, Northern Mallard). Several other dabbling ducks are on the supplementary list. Of the four lineages of the Anatini, only two occur in Australia. Species of the blue-winged ducks (lineage 3) recorded in

Australia are the shovelers *A. rhynchotis* and *A. clypeata* (Northern Shoveler; vagrant) and *A. querquedula* (Garganey; accidental). Within *Anas* in the restricted sense (lineage 4 of Johnson and Sorenson 1999), the wigeons were the first group to diverge. This contradicts the conclusions of Livezey (1991, 1997b), who considered the wigeons to fall outside the broadly defined *Anas*, on which basis he separated them as the genus *Mareca*. The next lineage to split off was the brown teals, comprising the New Zealand *A. aucklandica* (Auckland Islands Teal) and *A. chlorotis* (Brown Teal). These were followed by the pintails – *A. acuta* (Northern Pintail) recorded in Australia as a vagrant – then the grey teals. The grey teals include both *A. castanea* and *A. gracilis*. The final lineage comprised the sister clades of green-winged teals (not represented in Australia) and the mallards (in Australia, *A. superciliosa*, Pacific Black Duck, and introduced *A. platyrhynchos*). Johnson and Sorenson (1999) found two mitochondrial haplotypes in *A. platyrhynchos* – one clustering with other North American species of this group, and the other with Asian/Pacific mallards.

The taxonomy of the Australasian teals has been the subject of much debate. *Anas gracilis* (Australia, New Zealand and New Guinea; formerly on Rennell Island) is part of a complex that includes *A. gibberifrons* (Sunda Teal; Java to Sulawesi and Lesser Sundas) and *A. albogularis* (Andaman Teal; Andaman and Cocos Islands). These have variously been treated as subspecies of a single species (*A. gibberifrons*) (Johnsgard 1979; Carbaneras 1992a), with *A. gracilis* maintained separately from the other two, or with all three accepted as species. Parker *et al.* (1985) showed that *A. gracilis*, treated by Condon (1975) as a subspecies of *A. gibberifrons*, has differences in skull morphology that warrant its recognition as distinct species(see also Mees 1982a). This action has been generally adopted (e.g. McAllan and Bruce 1989; Sibley and Monroe 1990; Marchant and Higgins 1990; Christidis and Boles 1994; Coates and Bishop (1997); Dickinson 2003; Kear 2005), although Livezey (1991) combined *gracilis* and *gibberifrons* and kept *albogularis* separate. *Anas gibberifrons* now refers only to the form occurring in Indonesia. A molecular study of these taxa and *A. castanea* would prove very interesting.

Frith (1967) considered the Grey Teal and the New Zealand teals (*A. chlorotis*, *A. aucklandia*; *A. nesiotis*) to be conspecific with *Anas castanea.* A more widespread treatment has been to recognise two lineages, the *gracilis–gibberifrons* group and the *castanea–chlorotis* group. Livezey (1991, 1997b) placed the two groups in separate infragenera, forming a subgenus together with *A. bernei* (Madagascan Teal).

Johnson and Sorenson (1999) and Daugherty *et al.* (1999) found that *castanea* and *gracilis* formed a closely related clade that was well separated from the New Zealand teals. Kennedy and Spencer (2000) extended this using three mitochondrial genes and combining their sequence data with those of Johnson and Sorenson (1999). They confirmed that *gracilis* and *castanea* showed very low genetic divergence (0.09%) and fell together relative to the *chlorotis* group. The three members of the latter assemblage differed from each other by 0.77–0.92%.

A single immature male *Anas eatoni* (Kerguelen Pintail) was collected at Mawson Station, Australian Antarctic Territory (Johnstone and Irvine 2004). Chasen (1933) noted a specimen of *Anas gibberifrons* (supplementary list) from Christmas Island (see also Stokes 1988; Johnstone and Darnell 2004a). *Anas gracilis* and *gibberifrons* were not considered separate species at the time of the record and a bird occurring on Christmas Island is more likely to have been of *gibberifrons* (*sensu stricto*); the specimen, however, has not been located. This species is retained on the supplementary list, as in Christidis and Boles (1994).

Oxyura australis is part of a clade of New World stiff-tailed ducks that share black heads in the adult male (McCracken *et al.* 1999). Other members of the clade outside the New World are *O. maccoa* (Maccoa Duck; eastern and southern Africa) and *O. leucocephalus* (White-headed Duck; Mediterranean area through north India).

Dendrocygna guttata	Spotted Whistling-Duck
Dendrocygna eytoni	Plumed Whistling-Duck
Dendrocygna arcuata	Wandering Whistling-Duck
Biziura lobata	Musk Duck
Stictonetta naevosa	Freckled Duck
Cereopsis novaehollandiae	Cape Barren Goose
Cygnus atratus	Black Swan
Cygnus olor	Mute Swan^{I}
Branta canadensis	Canada Goose$^{V/I}$
Tadorna radjah	Radjah Shelduck
Tadorna tadornoides	Australian Shelduck
Tadorna variegata	Paradise Shelduck$^{LH/V}$
Chenonetta jubata	Australian Wood Duck
Malacorhynchus membranaceus	Pink-eared Duck
Nettapus coromandelianus	Cotton Pygmy-goose
Nettapus pulchellus	Green Pygmy-goose
Anas querquedula	Garganey
Anas rhynchotis	Australasian Shoveler
Anas clypeata	Northern Shoveler^{V}
Anas gibberifrons	Sunda Teal$^{S(C)}$
Anas gracilis	Grey Teal
Anas castanea	Chestnut Teal
Anas acuta	Northern Pintail^{V}
Anas eatoni	Kerguelen Pintail$^{AAT/V}$
Anas platyrhynchos	Northern Mallard^{I}
Anas superciliosa	Pacific Black Duck
Aythya australis	Hardhead
Oxyura australis	Blue-billed Duck

NEOAVES: METAVES

ORDER PHAETHONTIFORMES

Family Phaethontidae

The segregation of the Phaethontidae into its own order was discussed above (under Higher-Level Avian Systematics.

Kennedy and Spencer (2003) examined relationships among tropicbirds using 1756 base pairs of mitochondrial DNA sequence. The analyses unambiguously identified *Phaethon lepturus* (White-tailed Tropicbird) and *P. rubricauda* (Red-tailed Tropicbird) as each others closest relatives, with *P. aethereus* (Red-billed Tropicbird) the most divergent.

No changes are made from Christidis and Boles (1994).

Phaethon rubricauda	Red-tailed Tropicbird
Phaethon lepturus	White-tailed Tropicbird

ORDER PODICIPEDIFORMES

Family Podicipedidae

The currently accepted generic classification and sequence of grebes (Storer 1979; Sibley and Monroe 1990; Marchant and Higgins 1990; Llimona and del Hoyo *et al.* 1992; Christidis and Boles 1994) is based largely on courtship behaviour and variation of plumage patterns in downy young (Storer 1963, 1967; Fjeldså 1983). Variation in the number of fused thoracic vertebrae also has been used in defining genera (Sanders 1967; Storer 1982, 1987). From an examination of numerous osteological characters, Bocheński (1994) recovered the conventional groupings of grebes, other than the segregation of '*Podiceps*' *major* (Great Grebe; South America) into its own genus, *Podicephorus*.

The most recent classification is that of Fjeldså (2004), based on morphological characters, including many from Bocheński (1994). He obtained the same generic divisions as Bocheński. The main clades were *Rollandia* (golden grebes; South America) and the remaining taxa, which comprised two subclades, *Tachybaptus*-*Podilymbus* (pied-billed grebes) and the rest. Among the remainder, *Poliocephalus* was a sister genus to an unresolved trichotomy of *Podiceps*, *Aechmophorus* (swan grebes; North America) and *Podicephorus*. The generic circumscriptions and sequence of Fjeldså (2004) are followed here, although molecular assessments of relationships within the Podicipedidae are needed.

Once treated as conspecific (Peters 1931), *Tachybaptus novaehollandiae* (Australasian Grebe) and *T. ruficollis* (Little Grebe) were shown to be sympatric in parts of their distribution and so should be regarded as separate species (Mayr 1943). Although the extent of this sympatry has been questioned (White and Bruce 1986), the two are sympatric in New Guinea (Coates 1985). Consequently, the two are kept as separate species in most works (e.g. Storer 1979; Sibley and Monroe 1990; Marchant and Higgins 1990; Llimona and del Hoyo *et al.* 1992; Christidis and Boles 1994). Fjeldså (2004) grouped *T. novaehollandiae* with *T. pelzeni* (Madagascan Little Grebe) and *T. dominicus* (Least Grebe; New World), rather than with *T. ruficollis*. The specific separation of these taxa is maintained here.

Records of vagrant *Tachybaptus ruficollis* from Darwin, Northern Territory (Carter 1990a, 2000a) have been accepted for the Australian list (BARC 278).

Tachybaptus novaehollandiae	Australasian Grebe
Tachybaptus ruficollis	Little Grebe^{V}
Poliocephalus poliocephalus	Hoary-headed Grebe
Podiceps cristatus	Great Crested Grebe

ORDER PHOENICOPTERIFORMES

Family Phoenicopteridae

Peters (1931) treated *Phoenicopterus ruber* (Greater Flamingo; Africa and southern Europe through the Middle East to India and Sri Lanka) and *P. roseus* (Caribbean Flamingo) as separate species; most subsequent authors (e.g. Kahl 1979a; Sibley and Monroe 1990; del Hoyo 1992; Dickinson 2003), however, have included *roseus* as a subspecies of *P. ruber*. Some authors (details in Sangster 1997) have also included the *P. chilensis* (Chilean Flamingo) within *P. ruber*. Clay (1975) noted that the occurrence of unique species of feather lice on each form suggested that these flamingo taxa should be accorded separate species status, whereas Studer-Thiersch (1975) argued that the degree of differences in the group display between the forms was consistent with treating *ruber* and *roseus* as conspecific and *chilensis* as a distinct species. Sangster (1997) and Sangster *et al.* (1999) contended that all three were best treated as separate species, based on a consideration of qualitative differences in plumage and bill pattern and in display behaviour and vocalisations. Before a conclusive decision can be made, DNA distance data are needed to substantiate the levels of qualitative differentiation.

A record of *Phoenicopterus ruber* from the Cocos (Keeling) Islands has been accepted (Marchant and Higgins 1990). This record was probably of the form *P. ruber ruber*.

No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Phoenicopterus ruber	Greater Flamingo$^{CK/V}$

ORDER COLUMBIFORMES

Two families have been conventionally recognised within the Columbiformes (e.g. Peters 1937; Sibley and Monroe 1990; Baptista *et al.* 1997; Gibbs *et al.* 2001): Columbidae for the pigeons and Raphidae for the now extinct *Raphus cucullatus* (Dodo, Mauritius) and *Pezophaps solitaria* (Rodriguez Solitaire, Rodriguez Island). However, the DNA sequence-based phylogeny obtained by Shapiro *et al.* (2002) revealed that the Dodo and Solitaire should be included within the Columbidae and were most closely related to *Caloenas nicobarica* (Nicobar Pigeon) among living species, with *Goura* (crowned pigeons) and *Didunculus strigrostris* (Tooth-billed Pigeon) also linked to this clade. Consequently, the Raphidae are now regarded as a subfamily of the Columbidae (*contra* Dickinson 2003 and Livezey and Zusi 2007).

Family Columbidae

Within the Columbidae (excluding Raphinae, which he did not consider), Goodwin (1983) recognised five subfamilies: Columbinae (typical pigeons and doves); Treroninae (fruit-doves); Gourinae (crowned pigeons); Otidiphabinae (*Otidiphaps nobilis*, Pheasant Pigeon) and Didunculinae (*Didunculus strigirostris*, Tooth-billed Pigeon). This arrangement was followed by Baptista *et al.* (1997), Gibbs *et al.* (2001) and Dickinson (2003). Schodde (1997a) did not recognise any subfamilies, but did admit four tribes within the Australian region: Columbini (typical pigeons and doves; *Columba*, *Streptopelia*), Macropygiini (cuckoo-doves; *Macropygia*), Phabini (bronzewings and allies: *Chalcophaps*, *Geopelia*, *Geophaps*, *Leucosarcia*, *Ocyphaps*, *Petrophassa* and *Phaps*) and Lopholaimini (Australo-Papuan fruit-doves: *Ducula*, *Hemiphaga*, *Lopholaimus* and *Ptilinopus*). Schodde (1997a) excluded the Afro-Asian fruit-dove genus *Treron* from the Lopholaimini. (With the removal of *Treron*, the name Treronini Gray, 1840, no longer applies to these genera, with Lopholaimini Bonaparte, 1853, being the next available name). Following Goodwin (1983), Schodde (1997a) suggested that African *Turtur* (wood-doves) and *Oena capensis* (Namaqua Dove) could be part of the Phabini.

Johnson and Clayton (2000) investigated molecular relationships within some of the Columbidae using DNA sequences (cytochrome-*b* and β-fibrinogen intron 7). Although the number of Australasian genera examined was limited, several findings of the study are of relevance to the discussion here. There was little support for the subfamilies recognised by Goodwin (1983), nor were the two large subfamilies Columbinae and Treroninae (*sensu lato*) monophyletic in any of the analyses. The Treroninae (represented by *Phapitreron*, *Treron*, *Ptilinopus* and *Ducula*) were clustered with *Oena* and this assemblage was part of a poorly supported clade that included the Gourinae (*Goura*) and members of the Columbinae (*Columba, Streptopelia, Zenaida*, etc).

The genera *Geopelia* (represented by *G. cuneata*; Diamond Dove), *Leucosarcia* (*L. picata*; Wonga Pigeon) and *Phaps* (represented by *P. chalcoptera*; Common Bronzewing) formed a well-supported clade. This placement of the Wonga Pigeon is in keeping with conventional treatments based on morphology (Goodwin 1983), *contra* Frith (1982), who argued that it was an ancient Australian endemic with no close relatives. Furthermore, no obvious association was found between *Oena* and this clade. *Macropygia* (represented by *M. amboinensis* (as *phasianella*); Brown Cuckoo-Dove) was weakly aligned with *Columba* (typical pigeons) and *Streptopelia* (turtle-doves).

The DNA-based phylogeny of Shapiro *et al.* (2002) contained more taxa, including representatives of all five subfamilies recognised by Goodwin (1983), as well as the extinct Raphidae. The genera of Goodwin's Treroninae examined in this study divided into two clades: (1) *Ptilinopus*, *Drepanoptila*, *Alectroenas*, *Ducula*; and (2) *Treron*. The first clade was weakly associated with the Phabini, *Gallicolumba* (ground-doves) and *Otidiphaps* (Otidiphabinae), while *Treron* was associated weakly with *Turtur*, *Oena* and *Chalcophaps indica* (Emerald Dove). There was no support for inclusion of *Chalcophaps* in the Phabini, as advocated by Schodde (1997a). Instead, this genus was allied with *Turtur* and *Oena*. *Gallicolumba* formed part of the clade that included *Phaps* and related genera.

The two DNA sequence studies (Johnson and Clayton 2000; Shapiro *et al.* 2002) demonstrated that it is premature to recognise subfamilies or tribes within the Columbidae pending further comprehensive DNA sequence studies, incorporating more taxa and using additional mitochondrial and nuclear genes. Consequently, the sequence of genera and species used here follows that of Christidis and Boles (1994) for consistency, rather than as a better reflection of phylogeny than other arrangements.

Several lines of biochemical and behavioural evidence suggest that New World and Old World *Columba* are not closely related (briefly summarised in Baptista *et al.* 1997). Johnson and Clayton (2000) found that the genus is paraphyletic. This was confirmed by the more comprehensive DNA sequence study of Johnson *et al.* (2001), which included a greater coverage of species from the genera *Columba* and *Streptopelia*, and two additional mitochondrial genes (COI and ND2). This study revealed that both *Streptopelia* and *Columba* are paraphyletic. Old World *Columba* forms a clade with *Streptopelia* to the exclusion of New World *Columba*. Within *Streptopelia*, three clades were identified: (1) *S. chinensis* (Spotted Dove) and *S. senegalensis* (Laughing Dove); (2) *S. picturata* (Madagascar Dove) and *Nesoenas mayeri* (Pink Pigeon); and (3) all other species of *Streptopelia* examined. The study could not resolve whether these three clades form a monophyletic group to the exclusion of Old World *Columba*. These authors recommended that members of these three clades be retained in *Streptopelia* for the moment. In contrast, Cheke (2006) advocated recognising each at generic level. If this action were taken, the name *Stigmatopelia* Sundevall, 1872, applies to *chinensis-senegalensis*. These species are here kept in *Streptopelia*. The cuckoo-doves *Macropygia* and *Reinwardtoena* were the sister group to the entire *Columba–Streptopelia* complex.

Although Schodde (1982) combined *Ocyphaps* with *Geophaps*, he (Schodde 1997a) later maintained them as separate, but thought it likely that *Ocyphaps* was 'linked closely to *Geophaps* … via *G. plumifera*' (Spinifex Pigeon). Gibbs *et al.* (2001) also merged *Ocyphaps* with *Geophaps*.

Boles (1999a) examined the sternal morphology of Australasian pigeons and identified seven sternal forms. The generalised form occurring in *Columba* (typical pigeons), *Streptopelia* (turtle-doves) and *Zenaida* (New World mourning doves) is also present in *Macropygia* (cuckoo-doves), *Reinwardtoena* (cuckoo-doves) and *Phaps* (bronzewings), although in the last genus there is some deviation from the typical form. A second type is characteristic of fruit-doves, including *Ptilinopus* (fruit-doves) and *Ducula* (imperial-pigeons). Other taxa sharing this morphology are *Lopholaimus*, *Hemiphaga*, *Drepanoptila* and *Treron*. *Ocyphaps lophotes* (Crested Pigeon) has a third sternal type, which resembles *Phaps* in some features. A fourth group includes *Leucosarcia* (Wonga Pigeon), *Chalcophaps* (emerald doves) *Henicophaps* (New Guinean bronzewings), *Geopelia* (Peaceful Dove and allies), *Gallicolumba* (ground-doves) and *Trugon terrestris* (Thick-billed Ground-Pigeon). *Geophaps* (Spinifex Pigeon and allies) and *Petrophassa* (rock-pigeons) formed a fifth group, with a very distinctive morphology.

That *Lopholaimus* and *Hemiphaga* share the specific sternal morphology with *Ptilinopus* and *Ducula* implies that the former two genera belong with the fruit-doves – an association of these taxa with *Treron* was also supported. This analysis supported the inclusion of *Histriophaps* (*histrionica*, Flock Bronzewing) into the genus *Phaps*, as first proposed by Goodwin (1967a, b) and now generally accepted (Sibley and Monroe 1990; Christidis and Boles 1994; Schodde 1997a; Baptista *et al.* 1997; Gibbs *et al.* 2001). Given the differences in sternal morphologies (Boles 1999a), it is prudent to maintain *Ocyphaps* as a genus separate from *Phaps*. The unusual and highly derived morphology shared by *Petrophassa* and *Geophaps* suggests that these could be combined (Boles 1999a) into one genus (*Petrophassa*), as originally advocated by Goodwin (1967a, b); however, Johnstone (1981a) detailed several morphological characters that apparently aligned *Petrophassa* closer to *Geopelia* than to *Geophaps*. Protein allozyme data (Tyrrell 1994) are more consistent with sternal morphology and identify *Petrophassa* and *Geophaps* as a clade to the exclusion of *Geopelia*. These results also support a closer relationship of *Ocyphaps* to *Phaps* than to *Geophaps*.

Columba is represented in the Australian region by three species of the Old World clade (which retains this name if the genus is split): the introduced *C. livia* (Rock Dove; subspecies *livia*), the Australian endemic *C. leucomela* (White-headed Pigeon) and an extinct subspecies of *C. vitiensis* (White-throated Pigeon; *C. v. godmanae*) from Lord Howe Island. *Columba livia* is closely related to *C. rupestris* (Hill Pigeon) from Asia and they might be considered sibling species (Goodwin 1983). Given how similar these taxa are in appearance and the level of subspecific variation in *C. livia* (up to 13 subspecies recognised), the species status of *C. rupestris* requires further examination. The validity of *C. vitiensis godmanae* as a distinct subspecies is uncertain as no specimen exists – the description being based on a painting (Mathews 1915; Hindwood 1964). Both *C. leucomela* and *C. vitiensis* belong to a superspecies of dark, iridescent Australasian and Asian forms including *C. janthina* (Japanese Wood-Pigeon), *C. versicolor* (Bonin Wood-Pigeon; extinct), *C. jouyi* (Ryukya Pigeon) and possibly *C. pallidiceps* (Yellow-legged Pigeon) (Goodwin 1983).

Streptopelia is represented in Australia by three introduced breeding species: *S. senegalensis* (subspecies *senegalensis*), *S. chinensis* (a mixture of subspecies *chinensis* and *tigrina*) and *S. roseogrisea* (Barbary Dove). Baptista *et al.* (1997) list three subspecies of *S. chinensis*, and noted that *S. c. suratensis* was sufficiently distinct for potential recognition as separate species. The level of plumage differentiation between these forms is similar to that separating *Columba livia* and *C. rupestris*. Most authors maintain these as one species because intermediate forms apparently connect *suratensis* with *tigrina-chinensis* (Goodwin 1983). *Streptopelia c. suratensis* may have been introduced once to Queensland, but no birds resembling this form have been recorded (Frith and McKean 1975).

The Barbary or Collared Dove has many established feral populations around the world. Small populations of have been recorded from localities in several states (Higgins and Davies 1996; Barrett *et al.* 2003). Birds in the Alice Springs area have recently been recorded breeding. This dove is included on the list as an introduced species.

Although frequently given the scientific name *Streptopelia risoria* (e.g. AOU 1983; Higgins and Davies 1996), the Barbary Dove is now regarded as a long-domesticated form of *S. roseogrisea* (African Collared Dove). For this reason, it is acknowledged that the domesticated form does not technically warrant a distinct specific name (e.g. Cramp 1985; Dickinson 2003); nonetheless, some references still use *risoria*. A potential problem is that *risoria* Linnaeus, 1758, has priority over *roseogrisea* Sundevall, 1857. The specific name *S. roseogrisea* is accepted here, while leaving the matter of priority until there is greater international agreement on what named should be applied to this bird.

Macropygia amboinensis, *Chalcophaps indica*, *Geopelia striata* (Peaceful Dove), *Ptilinopus cinctus* (Banded Fruit-Dove) and *Ducula bicolor* (Pied Imperial-Pigeon) present similar problems because they have polytypic forms in which relationships among Australian and island populations are unresolved and have received various taxonomical treatments by different authors. Christidis and Boles (1994) maintained each as conspecific with some non-Australian populations. This action, like other published arrangements, was largely arbitrary. Proposed classifications have not been supported by detailed analysis. While, for each group, a case can be made for recognising Australian populations at specific level, preferred treatment of extralimital forms have not been addressed. Until such time as a strong case can be made for rearrangement of species boundaries in these groups, the admittedly arbitrary treatments in Christidis and Boles (1994) are maintained. Revision of extralimital forms is beyond the scope of this work. Each case is discussed below.

The taxonomy of the Australian representative of *Macropygia* is poorly resolved. It is part of the large *M. amboinensis–phasianella* group with representatives throughout Indonesia, New Guinea and Australia. Peters (1937) divided the complex into four species:

(1) *M. phasianella* (Australia, Java, Sumatra, the Lesser Sundas, Borneo and the Philippines)
(2) *M. amboinensis* (New Guinea and the Moluccas)
(3) *M. magna* (southern Moluccas and Lesser Sundas)
(4) *M. rufipennis* (Andaman and Nicobar Islands).

Although Mayr (1944) pointed out the distributional anomalies of such taxonomy, particularly with regard to *M. phasianella* and *M. amboinensis*, Goodwin (1983) accepted it, but suggested that *M. rufipennis* might be more closely related to *M. unchall* (southern and south-eastern Asia, western Indonesia). Goodwin (1967b, 1983) also argued that no single character could be found that would distinguish all forms of *M. amboinensis* from all forms of *M. phasianella*. Nevertheless, he then suggested that some behavioural characters appeared to link *M. amboinensis* more closely to *M. unchall* and that *M. phasianella* and *M. magna* might prove to be conspecific.

Storr (1973) treated the Australian member of the complex as part of *M. amboinensis*, but provided no details as to what other forms were included or excluded. Condon (1975) placed *M. phasianella* and *M. magna* within *M. amboinensis*, but did not specify the position of *M. rufipennis*. Frith (1982) suggested that *M. amboinensis* could be combined with Australian populations of *M. phasianella* and *M. magna* from Wallacea, while keeping the Philippine and Indonesian forms of *M. phasianella* (e.g. *emiliana* and *tenuirostris*) as separate species.

White and Bruce (1986), Sibley and Monroe (1990), Andrew (1992), Baptista *et al.* (1997) and Gibbs *et al.* (2001) recognised six species in the complex: *M. amboinensis* (Slender-billed Cuckoo-Dove; New Guinea and Wallacea), *M. phasianella* (Brown Cuckoo-Dove; Australia), *M. magna* (Dusky Cuckoo-Dove; Wallacea), *M. emiliana* (Ruddy Cuckoo-Dove; west Indonesia), *M. tenuirostris* (Philippine Cuckoo-Dove; Philippine Islands and Taiwan) and *M. rufipennis* (Andaman Cuckoo-Dove; Andaman and Nicobar Islands. Inskipp *et al.* (1996) treated the first five as members of the one species, in agreement with the treatment of Condon (1975). Schodde (1989) argued that the Australian forms were conspecific with *M. amboinensis* because the subspecies from north Queensland (*quinkan*) was morphologically intermediate between eastern Australian *phasianella* and New Guinean *amboinensis*. Schodde (1997a) later advocated inclusion of *M. magna* within *M. amboinensis*, as first proposed by Frith (1982). Christidis and Boles (1994) included Australian populations in *M. amboinensis*, but did not comment on other members of the complex. Dickinson (2003) treated *phasianella* and *amboinensis* as conspecific, but maintained *M. magna* as distinct. Here the treatment first advocated by Frith (1982) for the Australasian forms, and latter accepted by Schodde (1997a), is provisionally followed: Australian populations are referred to *M. amboinensis*. Current consensus (e.g. White and Bruce 1986; Sibley and Monroe 1990; Andrew 1992; Baptista *et al.* 1997; Gibbs *et al.* 2001; Dickinson 2003) for the remaining extralimital forms is to accept *M. emiliana*, *M. tenuirostris* and *M. rufipennis* as species.

Two species are currently recognised in *Chalcophaps* (Sibley and Monroe 1990; Christidis and Boles 1994; Schodde 1997a; Baptista *et al.* 1997; Gibbs *et al.* 2001; Dickinson 2003): *C. indica* (Emerald Dove; southern Asia through to Australasia and the Pacific) and *C. stephanii* (Stephan's Dove; northern Wallacea, New Guinea through to the Solomons). The subspecies of *C. indica* fall into two distinct morphological groups, *indica* in southern Asia and the Malay Archipelago, and *chrysochlora* in eastern Indonesia, Australasia and the Pacific. These are morphologically quite distinctive, with Goodwin (1983) suggesting that they could represent two species. White and Bruce (1986) argued that the two replaced each other abruptly in Wallacea. Rasmussen and Anderton (2004) considered that southern Asian birds should be treated as a distinct species from Australian ones, citing differences in plumage and vocalisations, so it may be that more than one species should be recognised. As work to resolve this problem is currently underway, no change is made here pending the results. The form of *C. indica* on Christmas Island, *natalis*, falls into the *indica* group.

Species limits within the *Geopelia striata* (Peaceful Dove) complex are another problem awaiting resolution. Peters (1937) and Goodwin (1967b, 1983) recognised only one species. Harrison (1969) examined aspects of morphology and behaviour in the complex and suggested that the three regional groups might be best treated as separate species: (1) *G. striata* (Zebra Dove; Malaysia, Sumatra and Java), (2) *G. placida* (Peaceful Dove; Australia and New Guinea) and (3) *G. maugeus* (Barred Dove; Timor and Tanimbar Islands). White and Bruce (1986), Sibley and Monroe (1990), Andrew (1992), Baptista *et al.* (1997) and Gibbs *et al.* (2001) accepted this suggestion. In contrast, Frith (1982) and Johnstone (1992) felt that the argument put forward by Harrison (1969) was not strong enough and kept the three groups as one species. Christidis and Boles (1994) and Inskipp *et al.* (1996) followed these latter authors in this regard. Nevertheless, Christidis and Boles (1994) stressed that further work was still required on the issue. Schodde (1997a) recognised the three species proposed by Harrison (1969), arguing that, because three subspecies were recognised in *placida*, *striata* and *maugeus*, they should be then elevated to species status in order to maintain a balanced taxonomy. Dickinson (2003) adopted the three species arrangement. Irrespective of the fact that neither Johnstone (1992, 2001) nor Baptista *et al.* (1997) recognised any infraspecific forms within *placida*, this argument appears to overlook the numerous examples of polytypic avian species within which the subspecies can be further segregated into several distinct groups. Here, *G. striata* only is recognised until new published data suggest otherwise.

Geopelia tranquilla and *G. placida* were simultaneously described by Gould (1844), both referring to the Peaceful Dove. Gould (1845) subsequently chose the former name, thus making him the first revisor. McAllan (2007) noted that *tranquilla* had been used as the name for this species for much of the first half of the 20th century. As such, this precludes its suppression as an unused senior synonym and its replacement by *placida*. Here Australian birds are treated as a subspecies of *G. striata*. If treated as separate species, their name would become *Geopelia tranquilla*.

As pointed out by McAllan (2007), *Columba picata* and *C. melanoleuca* were proposed simultaneously in the same work (Latham, 1802) – both referring to the Wonga Pigeon. Strickland (1843), as first revisor, selected *picata* for this species. As *picata* was used regularly until at least 1920, it cannot be rejected as an unused name (ICZN; Article 23), and thus replaces *melanoleuca* (i.e. *Leucosarcia picata*).

Following the general practice at that time (e.g. Goodwin 1983; Schodde *et al.* 1983; Garnett 1992), Christidis and Boles (1994) tentatively accepted *Gallicolumba norfolciensis* (Norfolk Island Ground-Dove), based on written descriptions (1788–1790) and an early painting by John Hunter in 1790 (Hindwood 1965), as an extinct species from Norfolk Island. The former presence of a species of *Gallicolumba* on the island was demonstrated by sub-fossil remains (Rich *et al.* 1983). Sibley and Monroe (1990: 200) noted that some question remained whether the bird in the Hunter drawings is conclusively identifiable and Schodde (1997a) subsequently argued that one of the descriptions and painting pertaining to the name *norfolciensis* are more consistent with the regional form of *Chalcophaps indica*. No change is made here pending re-examination of existing and newly acquired fossil material, other than to emphasise the tentative nature of this identification by shifting *G. norfolciensis* to the supplementary list. McAllan (2007) discussed nomenclatural issues relating to this name.

Peters (1937) included *Ptilinopus alligator* (Banded Fruit-Dove; northern Australia) as a subspecies of *P. cinctus* (Black-backed Fruit-Dove; Lesser Sundas), whereas Goodwin (1967b, 1983) treated the two as separate species and as part of a superspecies that also includes *P. dohertyi* (Red-naped Fruit-Dove; Sumba). Whereas White and Bruce (1986), Sibley and Monroe (1990), Baptista *et al.* (1997) and Gibbs *et al.* (2001) accepted this split, Condon (1975), Frith (1982), Christidis and Boles (1994), Schodde (1997a) and Dickinson (2003) continued to treat *alligator* as part of *P. cinctus*. This is maintained here. Given the level of plumage differentiation and geographical isolation between *alligator* and the remaining forms of *P. cinctus*, specific level recognition of the former may eventually prove to be preferable.

Schodde (1997a) alluded to the apparent unsettled status of species limits within the *Ptilinopus regina* (Rose-crowned Fruit-Dove) group, but provided no further details. Currently the *P. regina* group comprises five subspecies in Australia and the Lesser Sundas.

Chasen (1933) treated *Ducula whartoni* (Christmas Island Imperial-Pigeon; Christmas Island) as a subspecies of *Ducula rosacea* (Pink-headed Imperial Pigeon; Lesser Sundas) but, apart from Delacour (1947), most authors have kept the two as separate, and this is maintained here.

Peters (1937) recognised *Ducula bicolor* (Pied Imperial-Pigeon; south-east Asia, Moluccas and Lesser Sundas), *D. luctuosa* (White Imperial-Pigeon; Sulawesi), *D. melanura* (Moluccas) and *D. spilorrhoa* (Torresian Imperial-Pigeon; Australia, New Guinea and Bismarck Archipelago). Goodwin (1983) treated *melanura* as part of *D. bicolor* while retaining *D. luctuosa* and *D. spilorrhoa* as separate species. While most authors have accepted combining *melanura* with *bicolor* (e.g. Sibley and Monroe 1990; Baptista *et al.* 1997; Gibbs *et al.* 2001), with White and Bruce (1986) even suggesting that *melanura* is a localised morph of *bicolor*, there is still debate on how to treat *D. luctuosa* and *D. spilorrhoa*.

Condon (1975) and Frith (1982) followed Goodwin (1983) in maintaining *spilorrhoa* and *luctuosa*, while Johnstone (1981b) combined them with *D. bicolor*. Christidis and Boles (1994) and Schodde (1997a) followed Johnstone (1981b), although White and Bruce (1986), Sibley and Monroe (1990) and Baptista *et al.* (1997) continued to follow Goodwin (1983). Sibley and Monroe (1993) also treated *constans* (Kimberley, Australia) and *subflavescens* (Bismarck Archipelago) as species, following Bruce (1989). More recent authors (Schodde 1997a, Baptista *et al.* 1997, Johnstone 2001, Dickinson 2003) did not even recognise *constans* as a valid subspecies. Gibbs *et al.* (2001) accepted *D. subflavescens* (Yellow-tinted Imperial-Pigeon) as a species, but treated *spilorrhoa* and *bicolor* as one. Since Johnstone (1981b) is still the most comprehensive revision, it is followed here, as it was in Dickinson (2003), although further work on the complex is clearly required.

Andrews (1900) reported a small flock of *D. bicolor* on Christmas Island, from which a specimen was collected. The identity of this specimen has not been confirmed, but Schodde and Mason (1997: 400-401) tentatively assigned it to *D. bicolor bicolor*, presumably on biogeographical grounds. Consequently, if *D. bicolor* and *D. spilorrhoa* are treated as separate species, then the record from Christmas Island needs to confirmed and its identity assessed.

James (1996) reviewed the plumages and external morphology among the various forms of *Hemiphaga novaeseelandiae* (New Zealand Pigeon) and concluded that the three currently recognised subspecies – *novaeseelandiae* (New Zealand), *chathamensis* (Chatham Islands) and *spadicea* (formerly Norfolk Island, now extinct) – should be treated as separate species. Millener and Powelesland (2001) argued on the basis of size and plumage differences between *novaeseelandiae* and *chathamensis* that these forms were distinct species. Holdaway *et al.* (2001) treated all three forms as species. This treatment has merit and should be investigated further. In particular, a more detailed case needs to be made in support of separating *spadicea* as a species. For the present, we continue to follow the current consensus (e.g. Sibley and Monroe 1990; Baptista *et al.* 1997; Schodde 1997a; Gibbs *et al.* 2001; Dickinson 2003) in only recognising one species. McAllan (2007) argued that *C. argetraea* J.R. Forster, 1794, is senior to *C. spadicea* Latham, 1802, and should be reinstated for the extinct Norfolk Island subspecies of *Hemiphaga novaeseelandiae*.

Four species have been reported as vagrants since Christidis and Boles (1994). An observation and photograph of *Ptilinopus iozonus* (Orange-bellied Fruit-Dove) from Boigu Island, Torres Strait, have been accepted (Dooley 2005a; BARC 442). A report of *Streptopelia tranquebarica* (Red Collared Dove) from

Christmas Island was accepted (Dooley 2006a; BARC 474). A purported individual of *P. wallacii* (Wallace's Fruit-Dove) that came aboard a ship off the north-west coast of the mainland has not yet been considered (Dooley 2005b). Johnstone and Storr (1998) cited a record of an immature *Caloenas nicobarica* (Nicobar Pigeon) that landed on a ship in the Timor Sea, about 220 km east of Ashmore Reef. Because this falls within Australian territorial waters, it is included here, but as it was not considered by a rarities committee, it is placed on the supplementary list.

Caloenas nicobarica	Nicobar Pigeon^{S}
Columba livia	Rock Dove^{I}
Columba vitiensis	White-throated Pigeon$^{LH/E}$
Columba leucomela	White-headed Pigeon
Streptopelia roseogrisea	Barbary Dove^{I}
Streptopelia tranquebarica	Red Collared Dove$^{C/V}$
Streptopelia senegalensis	Laughing Dove^{I}
Streptopelia chinensis	Spotted Dove^{I}
Macropygia amboinensis	Brown Cuckoo-Dove
Chalcophaps indica	Emerald Dove
Phaps chalcoptera	Common Bronzewing
Phaps elegans	Brush Bronzewing
Phaps histrionica	Flock Bronzewing
Ocyphaps lophotes	Crested Pigeon
Geophaps plumifera	Spinifex Pigeon
Geophaps smithii	Partridge Pigeon
Geophaps scripta	Squatter Pigeon
Petrophassa albipennis	White-quilled Rock-Pigeon
Petrophassa rufipennis	Chestnut-quilled Rock-Pigeon
Geopelia cuneata	Diamond Dove
Geopelia striata	Peaceful Dove
Geopelia humeralis	Bar-shouldered Dove
Leucosarcia picata	Wonga Pigeon
Gallicolumba norfolciensis	Norfolk Island Ground-Dove$^{N/E}$
Ptilinopus cinctus	Banded Fruit-Dove
Ptilinopus magnificus	Wompoo Fruit-Dove
Ptilinopus superbus	Superb Fruit-Dove
Ptilinopus regina	Rose-crowned Fruit-Dove
Ptilinopus iozonus	Orange-bellied Fruit-Dove$^{TS/V}$
Ptilinopus wallacii	Wallace's Fruit-Dove^{S}
Ducula concinna	Elegant Imperial-Pigeon^{V}
Ducula whartoni	Christmas Island Imperial-Pigeon^{C}
Ducula mullerii	Collared Imperial-Pigeon$^{TS/V}$
Ducula bicolor	Pied Imperial-Pigeon
Lopholaimus antarcticus	Topknot Pigeon
Hemiphaga novaeseelandiae	New Zealand Pigeon$^{N/E}$

ORDER CAPRIMULGIFORMES

For reasons given in the introductory section on higher-level systematics, the Aegothelidae has been transferred to the Apodiformes.

Based on DNA–DNA hybridisation data (Sibley and Ahlquist 1990), Sibley and Monroe (1990) recovered the Aegothelidae (owlet-nightjars) as the sister lineage to the remaining Caprimulgiformes. They identified a sister relationship between the Steatornithidae (*S. caripensis*; Oilbird) and the Nyctibiidae (potoos), segregated *Eurostopodus* (eared nightjars) from the Caprimulgidae (nightjars) as a separate family (Eurostopodidae) and split the Podargidae into two families: Podargidae (Australasian frogmouths) and Batrachostomidae (Asian frogmouths).

Phylogenetic analyses by Mariaux and Braun (1996) based on cytochrome-*b* sequence data provided further resolution of relationships within the Caprimulgiformes. They found the Oilbird to be the sister lineage of the other members of the order and was not related to potoos. This is consistent with the traditional classification (Peters 1940). According to Mariaux and Braun (1996), the Nyctibiidae have a sister relationship with the assemblage comprising three clades, the Aegothelidae, Eurostopodinae and Caprimulginae–Chordeilinae; however, the authors did not include any members of the traditional Apodiformes in their study, which may have had a significant influence on the resulting phylogeny. Associations between these clades were not resolved, but there was no indication of a closer relationship between the Eurostopodinae and Caprimulginae–Chordeilinae than between either of them and Aegothelidae. Family-level separation between *Eurostopodus* and the other nightjars and between *Podargus* and *Batrachostomus* were supported by the results of Mariaux and Braun (1996)

Barrowclough *et al.* (2006) examined intergeneric relationships within the Caprimulgiformes using 2872 base pairs of the RAG-1 exon. *Aegotheles* was grouped with the Apodiformes, rather than with other caprimulgiform families. The Oilbird and potoos were not associated with each other, nor with other caprimulgiforms. The Podargidae (*Podargus* and *Batrachostomus*) formed a sister clade to the Caprimulgidae. Within the latter family, *Eurostopodus* was the sister species to the remaining genera. The results of Larsen *et al.* (2007), based on cytochrome-*b* sequences, also found that *Eurostopodus* fell outside of the remaining Caprimulgidae.

Condon (1975), Christidis and Boles (1994) and Schodde (1997f) included *Eurostopodus* within the Caprimulgidae, with Schodde separating it as a subfamily – Eurostopodinae – based on plumage and egg characters. Schodde and Mason (1981) cited several morphological features that linked *Eurostopodus* closer to the Chordeilinae than to the Caprimulginae. Based on these and other such characters, Holyoak (2001) included *Eurostopodus* within the Chordeilinae. Dickinson (2003) segregated *Eurostopodus* into a third subfamily. Available evidence supports recognition of Eurostopodidae as a separate family from the Caprimulgidae and this is accepted here.

Although both DNA–DNA hybridisation (Sibley and Ahlquist 1990) and cytochrome-*b* sequence data (Mariaux and Braun 1996) revealed a sister relationship between the Podargidae and Batrachostomidae, both studies also recorded high genetic distances between the two, which is consistent with separate family treatment. Holyoak (1999, 2001), in pointing out differences in nest structure between the two groups, also conceded that the two could be treated as separate families. This arrangement was followed by Inskipp *et al.* (1996). Cleere (1998) kept them in the same family without subfamilial separation and Dickinson (2003) maintained the Podargidae with two subfamilies.

Family Podargidae

The two genera of frogmouths (*Podargus* and *Batrachostomus*) have been either placed in a single family or each in its own monotypic family.

The population (*inexpectatus*) on Bougainville, Chouseil, and Isabel in the Solomon Islands has been regarded as a subspecies of *Podargus ocellatus* (Marbled Frogmouth). Cleere *et al.* (2007) found that it differed from this and other species of *Podargus* and *Batrachostomus* in several osteological features and by having a reduced number of rectrices. Cytochrome-*b* DNA sequences confirmed its distinctiveness. It has been placed in a separate genus *Rigidipennis*, which has a sister relationship to *Podargus*. While this change does not directly affect the Australian list, it is worth noting that *Podargus ocellatus* is now restricted to Australia and New Guinea.

Sequence of species follows the latest treatment in Holyoak (1999, 2001). No other inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Podargus strigoides	Tawny Frogmouth
Podargus papuensis	Papuan Frogmouth
Podargus ocellatus	Marbled Frogmouth

Family Eurostopodidae

Eurostopodidae (eared nightjars) are recognised as a family containing the single genus *Eurostopodus* (see discussion above). The sequence of the two native species follows the latest treatment in Holyoak (1999, 2001). No other inclusions or taxonomic changes have been made to Christidis and Boles (1994).

Eurostopodus mystacalis	White-throated Nightjar
Eurostopodus argus	Spotted Nightjar

Family Caprimulgidae

Most recent works have followed the division at subfamilial level of nighthawks (Chordeilinae) from the other nightjars (Caprimulginae) (Andrew 1992; Schodde and Mason 1997; Cleere 1998; del Hoyo *et al.* 1999; Holyoak 2001). Mariaux and Braun (1996) did not obtain clear separation between genera of the Caprimulginae (*Caprimulgus*, *Phalaenoptilus*) and Chordeilinae (*Chordeiles*; nighthawks).

The study of Barrowclough *et al.* (2006) included 21 species in 14 genera recognised by Peters (1940), including eight species placed in the speciose genus *Caprimulgus* (38–57 species depending on the classification). The conventional subfamily division between nighthawks and other genera was not supported: *Chordeiles* was embedded among genera comprising the Caprimulginae. Instead, *Eurostopodus* had a sister relationship to the other members of the family. The remaining nightjars formed four major clades. Larsen *et al.* (2007) also examined the intra-generic relationships within the Caprimulgidae. Their results indicated four well-supported clades – one restricted to *Chordeiles* and the other three comprising South American, African-Eurasian and North American taxa, respectively. Species that occur in Australia were not included in this study.

Both Cleere (1998, 1999) and Holyoak (2001) pointed out that the genus *Caprimulgus* is probably polyphyletic and should be split. Although the DNA–DNA hybridisation data of Sibley and Ahlquist (1990) clearly showed this to be the case, few taxa were included in their study to allow any meaningful taxonomic conclusions to be drawn. Barrowclough *et al.* (2006) and Larsen *et al.* (2007) confirmed that *Caprimulgus* is polyphyletic relative to several smaller, non-Australian genera.

Australia has one breeding species (*Caprimulgus macrurus*; Large-tailed Nightjar) plus two confirmed vagrant species (*C. affinis*, Savanna Nightjar; *C. indicus*, Grey Nightjar). The first two were included in the study by Barrowclough *et al.* (2006). Those authors found that, among the species examined, *C. macrurus* and *C. affinis* were successive sister taxa to a clade that included *C. europaeus* (European Nightjar). This, in turn, was a sister clade to the clade of two chordeiline genera, *Podager* and *Chordeiles*. Other, non-Australian species of *Caprimulgus* fell into two further clades that included a mixture of other genera. It is obvious that the limits of nightjar genera, particularly *Caprimulgus*, have to be redefined, with numerous consequent nomenclatural ramifications. Because of their association with *C. europaeus* (the type species of *Caprimulgus*), *C. macrurus* and *C. affinis* would probably retain that generic name. Because *C. indicus* was not included in the study, its position and generic name are uncertain – it is retained in *Caprimulgus* until more species are examined.

A vagrant record of *C. affinis* from Christmas Island, accepted by the Birds Australia Rarities Committee (BARC 187; Higgins 1999), was included by Christidis and Boles (1994). A photographic record of *C. indicus* from Ashmore Reef (Dooley 2005b) was accepted (BARC 450) and a report of a shipboard bird from the Timor Sea (Dooley 2006b) has not yet been considered.

Caprimulgus macrurus	Large-tailed Nightjar
Caprimulgus affinis	Savanna Nightjar$^{C/V}$
Caprimulgus indicus	Grey Nightjar$^{A/V}$

ORDER APODIFORMES

Family Aegothelidae

Dumbacher *et al.* (2003) conducted a phylogenetic study of the owlet-nightjars (*Aegotheles*) based on mitochondrial DNA sequences. Two larger-bodied New Guinean species (*insignis* and *tatei*) formed one clade, with the remaining species in another. Schodde (1997f) recognised the former as the subgenus *Euaegotheles* – an action that Dumbacher *et al.* (2003) considered unjustified on current knowledge. Such a separation was also rejected by Olson *et al.* (1987) on osteological grounds. Nonetheless, Dickinson

(2003) used *Euaegotheles* as the generic name for these species, based on information presented at a meeting in 2000; this study has not yet been formally published. *Euaegotheles* included a third species (*crinifrons*, north Moluccas), which was not part of the *insignis–tatei* clade. Thus, *Euaegotheles* as circumscribed by Dickinson (2003) is not monophyletic according to the findings of Dumbacher *et al.* (2003). This action does not affect the single Australian species, *Aegotheles cristatus* (Australian Owlet-nightjar). This is the sister species to *Aegotheles bennetti* (Barred Owlet-nightjar, New Guinea) (Dumbacher *et al.* 2003).

No inclusions or taxonomic changes below family level have been made to the treatment in Christidis and Boles (1994).

Aegotheles cristatus	Australian Owlet-nightjar

Family Apodidae

Peters (1940) divided the Apodidae into two subfamilies: Chaeturinae (American swifts, swiftlets, spinetails) and Apodinae (typical swifts). Brooke (1970), in a detailed analysis of morphological, anatomical and nesting characters, instead split the family into the Cypseloidinae (American swifts) and Apodinae (typical swifts, swiftlets, spinetails). The latter treatment has received general acceptance (e.g. Chantler and Driessens 1995; Chantler 1999; Schodde 1997g; Dickinson 2003). Based on a cladistic analysis of several morphological, anatomical and nesting characters, Holmgren (1998) suggested that the Hemiprocnidae should be included within the Apodinae of Brooke (1970). Such a treatment conflicts with DNA-based evidence (see below) and other morphological assessments (see also Karkhu 1992; Collins 2000). DNA–DNA hybridisation data (Sibley and Ahlquist (1990) and DNA sequence analyses (Lee *et al.* 1996; Chubb 2004b) also identified the Cypseloidinae and Apodinae of Brooke (1970) as distinct lineages.

Brooke (1970) divided the Apodinae into three tribes: Collocaliini (swiftlets); Chaeturini (spinetails); and Apodini (typical swifts). All three are present in Australia: Collocaliini represented by *Collocalia* and *Aerodramus*, Chaeturini by *Hirundapus* and Apodini by *Apus*. This tribal treatment has been generally adopted (Chantler and Driessens 1995; Chantler 1999; Schodde 1997g). Lee *et al.* (1996) considered their DNA sequence data to be equivocal regarding the monophyly of Collocalini; however, based on the same gene as Lee *et al.* (1996), but using a substantial longer sequence (1143 versus 406 base pairs), Thomassen *et al.* (2003) regarded the swiftlets to form a monophyletic clade.

Brooke (1970) divided *Collocalia*, as defined in Peters (1940), into three subgenera: *Collocalia* (glossy species that do not echolocate); *Aerodramus* (dull species that echolocate); and *Hydrochous* (a dull species that does not echolocate). He erected this last subgenus for *C. gigas* (Waterfall Swift; Malaysia, western Indonesia), but later elevated both *Hydrochrous* and *Aerodramus* to generic level (Brooke 1972). The revision by Brooke (1972) has received mixed, but growing, acceptance: Salomonsen (1983) and Chantler and Driessens (1995) recognised only *Collocalia*; Sibley and Monroe (1990) and Inskipp *et al.* (1996) accepted *Collocalia* and *Hydrochous,* but not *Aerodramus*; and Andrew (1992), Schodde (1997g), Chantler (1999) and Dickinson (2003) used the three genera as delimited by Brooke (1972). Christidis and Boles (1994) did not accept *Aerodramus* as a separate genus. Medway and Pye (1977) commented that echolocation may have arisen more than once in '*Aerodromus*' swiftlets with several of the echolocating species having a non-echolocating *Collocalia* (*sensu stricto*) species as the mutual ancestor. Christidis and Boles (1994) considered this to indicate that *Aerodramus* constituted a paraphyletic assemblage. Schodde (1997g), while noting that the discussion by Medway and Pye (1977) was confusing, retained *Aerodramus* because the consistent shared traits of its members favoured monophyly more than polyphyly.

Lee *et al.* (1996) examined relationships within the Apodidae using DNA sequencing of the mitochondrial cytochrome-*b* gene. Their analyses confirmed generic separation of *Aerodramus* from *Collocalia*. Thomassen *et al.* (2003) also confirmed the separation of these clades and regarded the ability to echolocate as a good character on which to distinguish these groups. The position of *Hydrochous* is problematical; both studies found it should be included within *Aerodramus* in some analyses, thus making the latter genus paraphyletic. Collins (2000) argued that *Hydrochous* should be treated as a genus of unknown affinities pending further molecular and anatomical data. Price *et al.* (2005) found that it paired with *Aerodramus papuensis* (Papuan Swiftlet) and these formed the sister group to the remaining members of *Aerodramus*.

Price *et al.* (2004, 2005), using both cytochrome-*b* and ND2, determined a similar division between *Aerodramus* and *Collocalia*. They also reported the discovery of echolocating ability in *C. troglodytes* (Pygmy Swiftlet). Consequently, these authors concluded that echolocation may have been lost in some lineages or have evolved on more than one occasion. In either case, it could no longer be a definitive character for distinguishing genera of swiftlets.

Treatment of the *Aerodramus spodiopygius–terraereginae* complex remains in a state of flux. Brooke (1972), Christidis and Boles (1994) and Schodde (1997g) treated this assemblage as a single species: *A. spodiopygius*. Conversely, White and Bruce (1986), Sibley and Monroe (1990), Chantler and Driessens (1995), Chantler (1999) and Dickinson (2003) separated Australian *A. terraereginae* (Australian Swiftlet) from south-west Pacific *A. spodiopygius* (White-rumped Swiftlet; Melanesia, Polynesia). The DNA studies of Lee *et al.* (1996) and Price *et* al. (2004, 2005) strongly supported the latter treatment, and it is adopted here. Lee *et al.* (1996) found that *A. terraereginae* was more closely associated with *A. brevirostris* (Himalayan Swiftlet; south and south-east Asia) and *A. maximus* (Black-nest Swiftlet; south-east Asia) than with *A. spodiopygius*. Price *et al.* (2004) also found this association, although *A. whiteheadi* (Whitehead's Swiftlet; Philippine Islands) appears to be even closer to *terraereginae*.

Within *A. terraereginae*, two forms are recognised: *A. t. terraereginae* (coastal north and central Queensland) and *A. t. chillagoensis* (inland north Queensland). Storr (1984) and Longmore (1991) treated these as separate species, but other authors (Sibley and Monroe 1990; Christidis and Boles 1994; Chantler and Driessens 1995); Schodde 1997g; Chantler 1999) have not accepted this. This issue is currently unresolved.

Debate surrounds the issue of species limits within the *Collocalia esculenta–linchi* complex. Three potential species groups have been identified (Salomonsen 1983; Somadikarta 1982, 1986): *C. marginata* (Grey-rumped Swiftlet; Philippines), *C. linchi* (Linchi Swiftlet; Indonesia) and *C. esculenta* (Glossy Swiftlet; south-east Asia, Indonesia, New Guinea, south-west Pacific). Somadikarta (1982) elevated *linchi* to species status – an action not accepted by White and Bruce (1986) and Inskipp *et al.* (1996). Sibley and Monroe (1990) treated the three regional groups as species – a classification which was followed by Schodde (1997g). Andrew (1992) and Christidis and Boles (1994) did not discuss *marginata*, but the former treated *linchi* as a species, whereas the latter included it in *C. esculenta*. Chantler and Driessens (1995), Chantler (1999) and Dickinson (2003) accepted *linchi* as a species, but placed *marginata* in *C. esculenta*. In their DNA study, Lee *et al.* (1996) examined representatives of the *marginata* group from the Philippines (*marginata*, *bagobo*), the *esculenta* group from Borneo (*cyanoptila*), and the *linchi* group from Java (*linchi*). The *marginata* and *esculenta* groups were clustered together relative to *linchi*. Subsequent work by Price *et al.* (2004), incorporating subspecies *becki* (Solomon Islands) and *nitens* (New Guinea) – in addition to the other taxa – also found this separation, although the populations of *esculenta* were paraphyletic in respect to *marginata*. The complex appears to comprise more than one species, and *C. esculenta* (including *marginata*) and *C. linchi*, at least, can be maintained. The species limits and the allocation of some forms to putative species are still far from resolved.

Within Australia, the *Collocalia esculenta–linchi* complex is represented by an endemic breeding form (*natalis*) on Christmas Island and as vagrants to northern Australia (Higgins 1999). Vagrant individuals probably originate from New Guinea and thus would be of the subspecies *C. e. nitens* (Salomonsen 1983; Schodde 1977g). Stresemann (1940) aligned *natalis* with the *esculenta* group rather than the geographically closer *linchi* group. Most authors (Sibley and Monroe 1990; Chantler and Driessens 1995; Chantler 1999; Schodde 1997g; Dickinson 2003) have followed this treatment, although noting the possibility that *natalis* might be better placed with *C. linchi*. Somadikarta (1986) and Carter (1994a) noted some plumage similarities between *natalis* and the *linchi* group. Salomonsen (1983) did not include *natalis* in his revision of Melanesian swiftlets. Here *natalis* is placed as a subspecies of *linchi* – an allocation that needs to be investigated further. A consequence of this action is that both *C. esculenta* and *C. linchi* have been recorded in Australian territory.

Apus affinis (Little Swift) and *A. nipalensis* (House Swift) are treated as separate species by some authors, but combined by others. Christidis and Boles (1994) and Higgins (1999) recognised only *A. affinis* (referred to as House Swift), as did Inskipp *et al.* (1996), who suggested that morphological differences between *affinis* and *nipalensis* are slight and subject to variation. These forms were treated as two species by Sibley and Monroe (1990), Chantler and Driessens (1995), Schodde (1997g), Chantler (1999) and Dickinson (2003). Brooke (1971) noted that further work was required to determine if there is intergradation where these forms occurred together in northern India. He (Brooke 1978a) later commented that these forms 'abut, but are not known to intergrade' without elaboration; this was rephrased by Sibley and Monroe (1990) as 'they show no sign of intergradation in the area of close approach'. Given the tentative nature of the original discussion, only a single species is recognised here at this time.

Apus affinis has been recorded as a vagrant based on several sight records and a single specimen. The last was identified by Robertson (1980) as belonging to the form *subfurcatus* (Great Sunda Islands). Schodde (1997g) considered Robertson's description to be ambivalent in respect to subspecific identification, suggesting that until the specimen was rechecked, no subspecific allocation should be made. He thought that, on geographic grounds, it was more likely to be subspecies *furcata* (Java). Rogers (1999b) confirmed that the specimen was referable to *subfurcatus* on the basis of detailed examination. This form falls within the *nipalensis* group of Sibley and Monroe (1990) and others. If *nipalensis* is eventually maintained at specific level, the name applied to Australian birds must be altered accordingly.

Several species have been reported as vagrants. A report of *Mearnsia novaeguineae* (Papuan Spine-tailed Swift) from Boigu Island, Torres Strait, has been accepted (BARC 451; Clarke 2006). Although the specific identification of a *Hirundapus* from Christmas Island could not be confirmed, the Committee accepted it as either *H. cochinchinensis* (Brown-backed Needletail) or *H. giganteus* (Silver-backed Needletail) (BARC 335). Similarly, a bird from near Broome, Western Australia, was accepted as either *Aerodramus maximus* (Black-nest Swiftlet) or *A. fuciphagus* (Edible-nest Swiftlet) without a more precise identification (BARC 342). These species are included on the supplementary list.

Collocalia esculenta	Glossy Swiftlet^{V}
Collocalia linchi	Linchi Swiftlet^{C}
Aerodramus terraereginae	Australian Swiftlet
Aerodramus vanikorensis	Uniform Swiftlet^{V}
Aerodramus maximus or *Aerodramus fuciphagus*	*Black-nest Swiftlet* or *Edible-nest Swiftlet*$^{S(C/V)}$
Hirundapus caudacutus	White-throated Needletail

Hirundapus cochinchinensis or Hirundapus giganteus	Brown-backed Needletail or Silver-backed Needletail$^{S(V)}$
Mearnsia novaeguineae	Papuan Spine-tailed Swift$^{TS/V}$
Apus pacificus	Fork-tailed Swift
Apus affinis	House Swift^{V}

NEOAVES: CORONAVES

ORDER PROCELLARIIFORMES

Alexander *et al.* (1965) advocated recognition of four living families in the Procellariiformes: Diomedeidae (albatrosses), Hydrobatidae (storm-petrels), Procellariidae (shearwaters, petrels, prions) and Pelecanoididae (diving-petrels). They did this to bring about stability to a literature that had become very unsettled, and their recommendations became the standard family-level classification used by most subsequent authors, including Condon (1975), Jouanin and Mougin (1979), Harrison (1985) and Brooke (2004). A similar classification was proposed by Livezey and Zusi (2007) on the basis of their extensive morphological studies. Based on DNA–DNA hybridisation data, (Sibley and Ahlquist 1990), Sibley *et al.* (1998) and Sibley and Monroe (1990) combined these in a single family, maintaining as subfamilies the Diomedeinae, Hydrobatinae and Procellariinae – the last subfamily including the diving-petrels. Merger of the Pelecanoididae with the Procellariidae had been advocated by Cracraft (1981) and Meredith (1985) on the basis of morphological assessments and was consistent with the biochemical studies of Harper (1978). This was adopted by Turbott (1990) and Christidis and Boles (1994), while other authors have retained the Pelecanoididae at family level (e.g. Carboneras 1992b, Dickinson 2003). Livezey and Zusi (2007) segregated the Pelecanoididae from the other procellariiforms in its own suborder. Christidis and Boles (1994) followed the groupings of Sibley and Monroe (1990), but treated them as families, rather than subfamilies.

Paterson *et al.* (1993, 1995, 2000) examined relationships among eight genera of Procellariiformes using protein allozymes and DNA sequences of the mitochondrial 12S RNA gene (381 base pairs). They identified a weakly supported sister relationship between storm-petrels (one species) and albatrosses (two species), with diving-petrels (one species) embedded among the other petrels (seven species). Nunn and Stanley (1998) sequenced the complete mitochondrial cytochrome-*b* gene for a range of species. In their analyses, five clades were evident:

(1) Hydrobatidae: Hydrobatinae (northern storm-petrels)
(2) Hydrobatidae: Oceanitinae (southern storm-petrels)
(3) Diomedeidae
(4) Pelecanoididae
(5) Procellariidae.

Monophyly of the conventional Hydrobatidae (Hydrobatinae and Oceanitinae) was not supported. Heidrich *et al.* (1998) also sequenced the cytochrome-*b* gene in several procellariiform taxa, although representatives of the Oceanitinae were not included in their study. The Hydrobatinae were recovered as the sister lineage to the other procellariiforms sampled. A basal position for both the Hydrobatinae and Oceanitinae relative to other procellariiform lineages is also consistent with biochemical (Harper 1978) and protein allozyme data (Barrowclough *et al.* 1981; Kuroda *et al.* 1990).

Penhallurick and Wink (2004) combined the data of Nunn and Stanley (1998) with those of Heidrich *et al.* (1998) and performed further analyses. In one analysis, the albatrosses had a sister relationship to all other procellariiforms, while the storm-petrels were monophyletic and were a sister group to the Procellariidae–Pelecanoididae. More often, the albatrosses formed a clade with the storm-petrels; however, the storm-petrels were not monophyletic in respect to the albatrosses. Depending on the analysis, either the Hydrobatinae or Oceanitinae paired with the Diomedeidae, with the remaining group having a sister relationship to these. The Pelecanoididae were a sister group to the Procellariidae in some trees, but embedded within that family in others.

Penhallurick and Wink (2004) advocated recognition of two families. The Diomedeidae comprised three subfamilies: the Diomedeinae, Hydrobatinae and Oceanitinae. The Procellariidae contained two subfamilies: the Procellariinae with three tribes (Fulmarini, fulmars and allies; Puffini, shearwaters; and Procellariini, *Procellaria* and *Bulweria*) and the Pelecanoidinae with two tribes (Pterodromini, petrels; and Pelecanoidini, diving-petrels). *Pachyptila* (prions) and *Halobaena* (*H. caerulea*, Blue Petrel) were treated as *incertae sedis*. This study, and some of its taxonomic conclusions, were criticised by Rheindt and Austin (2005). Until some aspects are resolved, and the more contentious issues supported by other studies, the radical classification of Penhellurick and Wink (2004) is not followed here. Their higher-level phylogeny supports the division of the northern and southern storm-petrels and the position of the diving-petrels as sister group to the remaining Procellariidae, as has been found by other studies (e.g. Nunn and Stanley 1998). Four families, Hydrobatidae, Oceanitidae, Diomedeidae, and Procellariidae (including Pelecanoididae) are accepted here. The sequence of families reflects the DNA phylogeny.

A more conservative classification below family level is adopted, maintaining the conventional treatment except where there is robust supporting evidence for this to be modified.

Family Hydrobatidae

The Hydrobatidae (northern storm-petrels) as defined here (see introductory section to the Procellariiformes) is predominantly centred in the Northern Hemisphere and comprises *Oceanodroma* with 11–12 extant species and the monotypic *Hydrobates* and *Halocyptena*. The last two genera are sometimes merged with *Oceanodroma* (Jouanin and Mougin 1979; Sibley and Monroe 1990; Carboneras 1992b; Dickinson 2003; Brooke 2004). Christidis and Boles (1994) included two species recorded as vagrants in the Australian region: *Oceanodroma leucorhoa* (Leach's Storm-Petrel) and *O. matsudairae* (Matsudaira's Storm-Petrel). Records from Australian waters of *tristrami* (Tristram's Storm-Petrel; Palliser 2002; BARC 305) and *O. monorhis* (Swinhoe's Storm-Petrel; Hobcroft 2000; BARC 295) have since been accepted.

Taxonomy within the *O. leucorhoa* group is complex and unresolved. At issue is the number of taxa that should be recognised, at what taxonomic rank, and whether *O. monorhis* should also be included within *O. leucorhoa* (Bourne and Jehl 1982; cf. Power and Ainley 1986). It has been suggested that *O. matsudairae* may be better regarded as a subspecies of *O. melania* (Black Storm-Petrel) (Sibley and Monroe 1990) and that *O. tristrami* is a subspecies of *O. markhami* (Markham's Storm-Petrel) (Wagstaffe 1972). The current practice (e.g. Jouanin and Mougin 1979; Sibley and Monroe 1990; Carboneras 1992b; Dickinson 2003, Brooke 2004) of recognising all six as separate species is followed here, pending new data.

The cytochrome-*b* DNA sequence data of Nunn and Stanley (1998) demonstrated that *Oceanodroma* as currently delimited is paraphyletic. The seven species examined divided into two groups: (1) *Oceanodroma leucorhoa*, *O. tristrami*, *O. furcata* (Fork-tailed Storm-Petrel) and *Hydrobates pelagicus* (European Storm-Petrel); and (2) *Halocyptena microsomma* (Least Storm-Petrel), *O. tethys* (Wedge-rumped Storm-Petrel) and *O. melania*. Penhallurick and Wink (2004) incorporated cytochrome-*b* data for *O. castro* (Band-rumped Storm-Petrel) and found that it is a sister species to the other two lineages.

To overcome this paraphyly, the options are either to combine the three current genera as *Hydrobates* Boie, 1822, or to recognise several smaller genera. Wolters (1975–1982) advocated the former treatment. Sibley and Monroe (1990) included *Halocyptena* in

Hydrobates, whereas Dickinson (2003) merged it in *Oceanodroma*. Penhallurick and Wink (2004), instead, identified four clades that they proposed that should be recognised as genera based on the magnitude of interspecific DNA distances observed (up to 12.4%).

Because *Oceanodroma furcata* formed a group with *Hydrobates pelagicus*, rather than other species placed in *Oceanodroma*, these two were segregated generically. This has significant nomenclatural ramifications. *Hydrobates* Boie, 1822, has priority over *Oceanodroma* Reichenbach, 1852, and this genus takes that name. The type species of *Oceanodroma*, however, is *furcata*, which means that name is no longer available for other species. The following names are the next available for the genera identified by Penhallurick and Wink (2004): *Cymochorea* Coues, 1864 (*leucorhoa*, *monorhis*, *tristrami*, *markhami*); *Halocyptena* (*microsoma*, *tethys*, *melania*, *madsudairae*) and *Thalobata* (*castro*). These authors lacked data on *homochroa* (Ashy Storm-Petrel) and *hornbyi* (Ringed Storm-Petrel), but because of the association found by previous authors of these with *leucorhoa* and *monorhis*, they suggested these species might be part of *Cymochorea*.

Given the limited number of species for which DNA data exist, it seems premature to recognise additional genera, particularly as supporting morphological diagnoses are lacking for the new arrangements. In the classification of Penhallurick and Wink (2004), the generic positions of some species remain unclear. It should be noted that these authors also obtained similar levels of divergence (up to 12.5%) between species of diving-petrels *Pelecanoides* as they did between clades of storm-petrels. For the present, it is more prudent to combine *Oceanodroma* and *Halocyptena* into *Hydrobates*. From this action, the four species recorded within the Australian region are *Hydrobates leucorhoa*, *H. matsudairae*, *H. tristrami* and *H. monorhis*. If the treatment of Penhallurick and Wink (2004) were followed, these would become *Cymochorea leucorhoa*, *C. tristrami*, *C. monorhis* and *Halocyptena matsudairae*, respectively.

Two of the species on the list were added as vagrants since Christidis and Boles (1994). *Hydrobates monorhis* (Swinhoe's Storm-Petrel) between Broome, Western Australia, and Ashmore Reef in late 1999 (BARC 295) and *H. tristrami* (Tristram's Storm-Petrel) off Sydney, New South Wales, in late 2000 (BARC 305)

Hydrobates monorhis	Swinhoe's Storm-Petrel ^{V}
Hydrobates leucorhoa	Leach's Storm-Petrel^{V}
Hydrobates tristrami	Tristram's Storm-Petrel^{V}
Hydrobates matsudairae	Matsudaira's Storm-Petrel$^{V,C/V}$

Family Oceanitidae

The Oceanitidae (southern storm-petrels) are largely centred in the Southern Hemisphere and comprise seven species in five genera (*Oceanites*, *Garrodia*, *Pelagodroma*, *Fregetta* and *Nesofregetta*) (Jouanin and Mougin 1979; Sibley and Monroe 1990; Carboneras 1992b; Dickinson 2003; Brooke 2004). *Garrodia* is sometimes included in *Oceanites* (e.g. Condon 1975; Olson 1985b; Turbott 1990). Olson (1985b) considered that *Pelagodroma* should also be merged into *Oceanites*. Johnstone and Storr (1998) included both *Garrodia* and *Pelagodroma* in *Oceanites*. Nunn and Stanley (1998) sequenced the cytochrome-*b* gene for four of the five genera (*Nesofregetta* was not examined). All were similarly diverged from one another (about 10%). The inferred phylogenetic relationships placed *Pelagodroma* and *Garrodia* as sister lineages; these were then linked to *Fregetta*, and *Oceanites* was a sister group to the other lineages. If *Garrodia* and *Pelagodroma* were to be included in *Oceanites*, then *Fregetta* would also need to be included. The DNA data support retaining *Garrodia* and *Pelagodroma* as separate genera.

Five species have been recorded from the Australian region: *Oceanites oceanicus* (Wilson's Storm-Petrel), *Garrodia nereis* (Grey-backed Storm-Petrel), *Pelagodroma marina* (White-faced Storm-Petrel), *Fregetta tropica* (Black-bellied Storm-Petrel) and

F. grallaria (White-bellied Storm-Petrel). Carboneras (1992b) noted that *Fregetta tropica* and *F. grallaria* are sometimes combined under the latter name. The relatively large cytochrome-*b* DNA distances (7.4%) recorded between these two taxa (Nunn and Stanley 1998; Penhallurick and Wink 2004) confirms their status as separate species.

Holdaway *et al.* (2001) separated *Pelagodroma albiclunis* (Kermadec Storm-Petrel) as a species separate from *P. marina*, but provided no justification for this. Imber (1984) questioned the validity of *albiclunis*, proposing that the white rump (versus grey in the otherwise similar *dulciae*) was the result of heavy feather wear on young birds. McAllan *et al.* (2005) confirmed that several specimens of *albiclunis* were demonstrably adults. This contradicts expressed doubt concerning the validity of this subspecies (e.g. Imber 1984; Carboneras 1992b). No case has been made for species status, however. The breeding locality of *albiclunis* is thought to be near the Kermadecs (Veitch *et al.* 2004); McAllan *et al.* (2005) raised the possibility that this taxon still breeds in the Lord Howe Island group. Sight records are known from near Lord Howe Island and off Wollongong, New South Wales (McAllan *et al.* 2005). This form is here regarded as a subspecies of *P. marina*.

Oceanites oceanicus	Wilson's Storm-Petrel
Garrodia nereis	Grey-backed Storm-Petrel
Pelagodroma marina	White-faced Storm-Petrel
Fregetta tropica	Black-bellied Storm-Petrel
Fregetta grallaria	White-bellied Storm-Petrel^{V,LH}

Family Diomedeidae

The longstanding convention has been to segregate the two sooty albatrosses in the genus *Phoebetria* and the remaining species in *Diomedea* (e.g. Alexander et al. 1965; Jouanin and Mougin 1979; Harrison 1985; Marchant and Higgins 1990; Sibley and Monroe 1990; Turbott 1990; Carboneras 1992b; Christidis and Boles 1994). Christidis and Boles (1994) noted that the generic distinction between *Diomedea* and *Phoebetria* needed to be examined. Nunn *et al.* (1994, 1996) examined the evolutionary relationships of the albatrosses using complete sequence data of the cytochrome-*b* gene. Four phylogenetic groups were identified:

(1) great albatrosses: *Diomedea exulans* (Wandering Albatross), *D.* (*exulans*) *amsterdamensis* (Amsterdam Albatross), *D. epomophora* (Royal Albatross)
(2) northern albatrosses: *D. irrorata* (Waved Albatross), *D. albatrus* (Short-tailed Albatross), *D. nigripes* (Black-footed Albatross), *D. immutabilis* (Laysan Albatross)
(3) mollymawks: *D. chlororhynchos* (Yellow-nosed Albatross), *D. bulleri* (Buller's Albatross), *D. cauta* (Shy Albatross), *D. chrysostoma* (Grey-headed Albatross), *D. melanophris* (Black-browed Albatross)
(4) sooty albatrosses: *Phoebetria fusca* (Sooty Albatross), *P. palpebrata* (Light-mantled Sooty Albatross).

These four groups were consistent with biogeographical distribution, size and characters of the bill (reviewed in Nunn *et al.* 1996), and corresponded in sequence to the following subgeneric/generic names:

(1) *Diomedea* Linnaeus, 1758 (great albatrosses, type *exulans* Linnaeus, 1758)
(2) *Phoebastria* Reichenbach, 1853 (northern albatrosses, type *albatrus*, Pallas, 1769
(3) *Thalassarche* Reichenbach, 1853, mollymawks, type *melanophris* Temminck, 1828
(4) *Phoebetria* Reichenbach, 1853 (sooty albatrosses, type *palpebrata* J.R. Forster, 1785.

The DNA phylogeny linked *Diomedea* with *Phoebastria* and *Thalassarche* with *Phoebetria* as sister lineages. This demonstrated clear paraphyly of *Diomedea* as conventionally defined. Three options to correct this taxonomic anomaly are to:

(1) include all albatrosses in one genus, *Diomedea* (e.g. Mathews 1948)
(2) adopt two genera *Diomedea* (with subgenera *Diomedea* and *Phoebastria*) and *Phoebetria* (subgenera *Phoebetria* and *Thalassarche*)
(3) recognise all four at generic level.

Nunn *et al.* (1996) and Robertson and Nunn (1998) advocated the recognition of each lineage as a separate genus. The level of genetic divergences between the four lineages ranged from 6.2% to 11.2% (see also Penhallurick and Wink 2004), with the lowest values being recorded between *Diomedea* and *Phoebastria*. While DNA evidence for elevating all to generic, rather than subgeneric, level is not overly compelling, this arrangement has received almost universal acceptance (e.g. AOU 1998; Knox *et al.* 2002; Sangster *et al.* 2002; Dickinson 2003; Brooke 2004) and is adopted here.

Nunn *et al.* (1996) analysed DNA data for the 14 species listed in Sibley and Monroe (1990) and Carboneras (1992b). Complete cytochrome-*b* sequence data for 22 species and subspecies of albatross was presented by Nunn and Stanley (1998), in which they treated all albatross taxa examined as species without explanation. Robertson and Nunn (1998), explicitly adopting the Phylogenetic Species Concept, proposed the elevation of several subspecies and populations to species status. The changes in taxonomy they advocated, and the English names applied, are as follows:

- *Diomedea sanfordi* (Sanford's Albatross) from *D. epomophora* (Royal Albatross)
- *Diomedea gibsoni* (Gibson's Albatross), *D. antipodensis* (Antipodean Albatross) and *D. chionoptera* (Snowy Albatross) from *D. exulans* (Wandering Albatross)
- *Diomedea amsterdamensis* was treated at the species level
- *Thalassarche carteri* (Carter's Mollymawk) from *T. chlororhynchos* (Yellow-nosed Mollymawk)
- *Thalassarche impavida* (Campbell Mollymawk) from *T. melanophris* (Black-browed Mollymawk)
- *Thalassarche steadi* (White-capped Mollymawk), *T. salvini* (Salvin's Mollymawk) and *T. eremita* (Chatham Mollymawk) from *T. cauta* (Shy Mollymawk)
- *Thalassarche* sp. nov. (Pacific Mollymawk) from *T. bulleri* (Buller's Mollymawk) (the unnamed form is that which breeds on Three Kings and Chatham Islands and is conventionally called *platei*; however, the type specimen of *platei* has been found to be a juvenile nominate *bulleri* and thus this population requires a new name; Robertson and Nunn 1998).

Bourne (1989) and Medway (1993) determined that the name *exulans* Linnaeus, 1758, referred to the large southern form that bred on South Georgia, Marion and Prince Edward, Crozet, Kerguelan and Macquarie Islands. This name thus replaces *chionoptera* Salvin, 1896. Although this was followed by Nunn and Stanley (1998), it was ignored by Robertson and Nunn (1998) (Bourne 1999; Penhallurick and Wink 2004).

Brooke (2004) modified some of the taxonomic delimitations, as well as English and scientific names, proposed by Robertson and Nunn (1998). He accepted most of their taxa, except for treating *gibsoni* as synonymous with the nominate *exulans*, separating out the Tristan Island population of *exulans* as *D. dabbenena* (Tristan Albatross) and retaining *steadi* and '*platei*' as part of *D. cauta* and *D. bulleri*, respectively. He also treated *amsterdamensis* as a subspecies of *exulans*. English names that differed were Northern Royal Albatross (*D. sanfordi*), Southern Royal Albatross (*D. epomophora*), Indian Yellow-nosed Albatross (*D. carteri*) and Atlantic Yellow-nosed Albatross (*D. chlororhynchus*), and the use of 'albatross' rather than 'mollymawk'.

Levels of DNA sequence divergence reported in Nunn *et al.* (1996) between conventionally recognised sister species of albatross were greater than 1.6%, with the exception of *D. exulans* and *D. amsterdamensis* (0.87%). Robertson and Nunn (1998) did not discuss the DNA data in any detail, but implied that these supported the elevation of a number of conventional subspecies to species level. Penhallurick and Wink (2004) calculated DNA sequence divergences between the taxa of albatross examined by Nunn and Stanley (1998). They observed that several of the apparent 'new' species were identical in sequence to the species from which they were being split. Moreover, in all cases, divergences between the 'new' species and the 'parent' species were less than 1.1%. While the combination of DNA divergences and morphological characters comprise valid criteria for the actions of Robertson and Nunn (1998) under the tenets of the Phylogenetic Species Concept, it does not accord with the guidelines adopted here. The DNA data are not consistent with species level differences. Accepting all the proposed species would treat at equivalent taxonomic level (species) forms that differ markedly in their levels of genetic differentiation. For example, differences between conventional subspecies of *D. exulans* and those of *D. epomophora* ranged from 1.3 to 3.6%, whereas differences between subspecies of *exulans* were 0-0.87% and between those of *epomophora* were 0-0.09%.

The conventional species of mollymawks had similar, but somewhat less pronounced interspecific differences compared with intraspecific differences between their conventional subspecies, which is indicative of two tiers of genetic differentiation. A similar conclusion was reached by Penhallurick and Wink (2004).

Using mitochondrial DNA sequences of the hypervariable control region and nine microsatellite markers, Burg and Croxall (2004) investigated relationships within *Diomedea exulans* (*sensu lato*), regarded as consisting of the species *D. exulans* (*sensu stricto*), *D. antipodensis*, *D. gibsoni* and *D. dabbenena*. They found that the level of genetic differentiation between *gibsoni* and *antipodensis* did not support separating these from each other at specific level. Birds breeding on the more southerly sub-Antarctic islands (*exulans*) showed no genetic differentiation. Burg and Croxall (2004) found sequence divergence levels between *exulans*, *dabbenena* and *antipodensis–gibsoni* of 4.5–5.2%. They recognised three species within the context of the proposed taxonomy of Robertson and Nunn (1998).

The breeding population of great albatross on Amsterdam Island was described as a separate species, *D. amsterdamensis*, by Roux *et al.* (1983). This was accepted by most authors (e.g. Harrison 1985; Marchant and Higgins 1990; Sibley and Monroe 1990; Carboneras 1992b; Brooke 2004), but Bourne (1989) and Vuilleumier *et al.* (1992) argued it was best treated as a subspecies of *D. exulans* – an action followed by Dickinson (2003). Nunn *et al.* (1996) and Nunn and Stanley (1998) found low DNA divergences between the various forms of *D. exulans*, with *amsterdamensis* embedded within this complex. This indicates that *D. amsterdamensis* is best treated as a subspecies of *D. exulans* (see also Penhallurick and Wink 2004). There are several apparent records of *Diomedea exulans amsterdamensis* off the NSW coast (e.g. McAllan and Bruce 1989), including a bird captured, photographed and banded at sea off Wollongong, New South Wales, by members of the New South Wales Albatross Study Group. None of these reports have been assessed by BARC.

Abbott and Double (2003) compared mitochondrial control region sequences to examine relationships among populations of *Thalassarche cauta* (*sensu lato*): *cauta* (*sensu stricto*), *steadi*, *salvini* and *eremita*. Two pairs of taxa were recovered. Members of *cauta* and *steadi* had a sequence divergence of 1.8%, while that of *salvini* and *eremita* was also low, 2.9%, which is somewhat unexpected given the degree of morphological distinctiveness between these forms. Abbott and Double's (2003) considered that these findings did not resolve species level distinctions between members of pairs. The difference between *cauta–steadi* and *salvini–eremita* was substantially greater at 7.0%.

Burg and Croxall (2001) examined part of the mitochondrial DNA control region (219 base pairs) in a study on population structure in *Thalassarche melanophris melanophris*, *T. m. impavida* and *T. chrysostoma*. They argued that the level of divergences obtained between *impavida* and *melanophris* (4.16% to 7.16%) supported separate species recognition of the two. Care must be exercised with these figures as the control region evolves up to 10 times faster than cytochrome-*b* (e.g. Quinn 1999; Eberhard *et al.* 2001). Burg and Croxall (2001) compared their data with other studies examining control region divergences in avian species and subspecies, but again these comparisons are limited in their instructiveness because different parts of the control region evolve at markedly different rates. These authors targeted a small rapidly evolving section of the control region, while some other studies sampled complete or near complete control regions, including both highly conserved and variable regions. As a comparison, when Ritchie (2001) examined a part of the hypervariable control region in penguins, he recorded divergences of 10–16% between closely related, but well-accepted distinct species, whereas in cases where the species status of taxa has been questioned, he obtained lower divergences of 4–6.5%.

Jouanin and Mougin (1979) corrected *melanophris* to *melanophrys* without explanation. This was regarded as an unjustified amendment (AOU 1983, 1998; Sibley and Monroe 1990), implying that *melanophris* – the original spelling by Temminck, 1828 – must stand. This was used by Harrison (1985), Carboneras (1992b) and Christidis and Boles (1994), but not by Dickinson (2003), who judged *melanophrys* to be prevailing usage, or by Brooke (2004). That either spelling is currently the prevalent practice is not evident. Here *melanophris*, as used by Christidis and Boles (1994), is retained.

Dickinson (2003) maintained the conventional treatment of species-level albatross taxonomy. It is recognised that following this classification, as is done here, is contentious. That the morphologically diagnosable forms within the great albatrosses and mollymawks are here retained as subspecies, rather than species, should not be regarded as reason not to record this information for observational and specimen records where it can be determined with confidence. More importantly, it should in no way be used as a rationale to downgrade conservation efforts for these taxa.

A report of *Phoebastria immutabilis* from Norfolk Island was initially not accepted and thus placed on the supplementary list in Christidis and Boles 1994. Upon on subsequent review, it has been accepted (BARC 130); it is now incorporated on the main list as a vagrant.

Diomedea exulans	Wandering Albatross
Diomedea epomophora	Royal Albatross
Phoebastria immutabilis	Laysan Albatross$^{N/V}$
Thalassarche melanophris	Black-browed Albatross
Thalassarche cauta	Shy Albatross
Thalassarche chrysostoma	Grey-headed Albatross
Thalassarche chlororhynchos	Yellow-nosed Albatross
Thalassarche bulleri	Buller's Albatross
Phoebetria fusca	Sooty Albatross
Phoebetria palpebrata	Light-mantled Sooty Albatross

Family Procellariidae

This family is here regarded as including *Pelecanoides* (diving-petrels), frequently segregated as the Pelecanoididae. In its restricted sense. (i.e. exclusive of the diving-petrels), the Procellariidae are often divided into four groups:

(1) fulmars and allies (*Macronectes*, *Fulmarus*, *Thalassoica*, *Daption* and *Pagodroma*)
(2) gadfly petrels (*Pterodroma*, often incorporating *Pseudobulweria* and *Lugensa*, and *Bulweria*)

(3) prions and Blue Petrel (*Pachyptila* and *Halobaena*)
(4) shearwaters (*Procellaria*, *Calonectris* and *Puffinus*) (e.g. Marchant and Higgins 1990; Carboneras 1992b).

These groupings are not entirely resolved, with some genera, such as *Bulweria*, being difficult to place (Marchant and Higgins 1990).

The cytochrome-*b* DNA sequence data of Nunn and Stanley (1998) provided resolution on a number of taxonomic issues within the Procellaridae. Six clades were readily identifiable, and these were confirmed by the reanalysis of the data by Penhallurick and Wink (2004). The first clade, *Fulmarus* and allies, was identified as monophyletic. A second clade comprised *Lugensa*, *Calonectris* and *Puffinus*. *Procellaria* and *Bulweria* formed a third clade. The fourth consisted of *Pterodroma* (*sensu stricto*) and the fifth included only *Pelecanoides*. *Halobaena* and *Pachyptila* comprised the sixth. Although not examined by Nunn and Stanley (1998), *Pseudobulweria* is probably part of this third lineage with *Procellaria* and *Bulweria* (discussed further below).

The fulmarine assemblage is sometimes separated in the subfamily Fulmarinae with the remaining genera contained in the Procellariinae (Carboneras 1992b). Penhallurick and Wink (2004) argued that the DNA sequence data supported the recognition of two subfamilies: the Procellariinae – with the first three lineages of Nunn and Stanley (1998) each regarded as a tribe (Fulmarini, fulmars and allies; Puffini, shearwaters; and Procellariini, *Procellaria* and *Bulweria*) – and the Pelecanoidinae with two tribes corresponding to clades four and five (Pterodromini, petrels; and Pelecanoidini, diving-petrels). The sixth grouping, *Pachyptila* (prions) and *Halobaena* (*H. caerulea*, Blue Petrel) were cited as *incertae sedis*, although Penhallurick and Wink (2004) showed this clade as the sister taxon to the other members of the family. All three phylogenetic trees presented by these authors recovered these six lineages, but the topology of only one supported their recommended classification. The phylogenetic tree in Nunn and Stanley (1998), however, also recorded this arrangement. The main features of the subfamilial and tribal groups presented by Penhallurick and Wink (2004) appear robust, but there remains the need for more studies to resolve the branching patterns. For the purposes of this list, the generic sequence is consistent with the DNA results as presented in Penhallurick and Wink's (2004) preferred tree.

The DNA data (Nunn and Stanley 1998) identified a sister relationship between *Macronectes* (giant petrels) and *Fulmarus* (fulmars). These were then linked in sequence to *Daption* (*D. capense*; Cape Petrel), *Thalassoica* (*T. antarctica*; Antarctic Petrel) and *Pagodroma* (*P. nivea*; Snow Petrel).

Treatment of the two forms of *Macronectes* as separate species was originally proposed by Bourne and Warham (1966), based largely on differences in breeding times and the fact that the two breed sympatrically on Macquarie Island. Very low levels (0.1–1.5%) of mixed pairs have been reported from Macquarie, Marion and Bird Islands (Burger 1978; Johnstone 1978; Hunter 1982), but only at Bird Islands has successful hatching been observed; no mixed pairs have been recorded at the Crozet Islands (Voisin 1978). This specific arrangement has received overwhelming acceptance. Based on the cytochrome-*b* DNA sequence data of Nunn and Stanley (1998), Penhallurick and Wink (2004) calculated genetic distances of 0.6% between *Macronectes giganteus* (Southern Giant-Petrel) and *M. halli* (Northern Giant-Petrel) and 3.8% between *Fulmarus glacialoides* (Southern Fulmar) and *P. glacialis* (Northern Fulmar). Largely on the basis of the comparative genetic distances between congeneric procellariiform species, these authors advocated that *Macronectes halli* be combined again into *M. giganteus*. They also noted that *Pterodroma neglecta* (Kermadec Petrel) has summer and winter breeding populations that are not even separated as subspecies. Rheindt and Austin (2005) argued against this proposal, regarding this temporal separation in breeding as a significant isolating mechanism. They believed that despite the low genetic difference and occasional hybridisation, the two forms maintained their identities, thus demonstrating species status for both. There may be a case for recognising only a single species of *Macronectes*, but further DNA sequence data, particularly from nuclear gene(s), from a larger sample of individuals and populations of both *M. halli* and *M. giganteus,* and further examination on the nature of their interactions across their range are needed. Consequently, both species of *Macronectes* are retained, as is conventional, pending such study.

Among populations of *Pagodroma nivea*, there is considerable variation in size (e.g. Cowan 1981), and two subspecies have been generally recognised on this basis: *nivea*, and the much larger *confusa* (e.g. Jouanin and Mougin 1979; Carboneras 1992b). Substantial sexual dimorphism within both forms (Croxall 1982) complicates the issue, and Haftorn *et al.* (1988) raised doubts about the validity of recognising two subspecies. Jouventin and Viot (1985) analysed morphological and protein allozyme data, concluding that there was evidence for two forms of *Pagodroma nivea*, which now hybridise in areas of contact (see also Rogers 1990a). Sibley and Monroe (1990) treated these as species, based on unpublished comments by K. H. Voous of occasional sympatric breeding in eastern Antarctica; later, however, Sibley and Monroe (1993) combined these as one species. Other authors also recognised a single species (e.g. Harrison 1985; Marchant and Higgins 1990; Turbott 1990; Carboneras 1992b; Christidis and Boles 1994; Dickinson 2003) – often with two subspecies. The underlying mechanisms for the development and perpetuation of these size morphs has attracted considerable attention (e.g. Barbraud and Jouventin 1998; Jouventin and Bried 2001). Brooke (2004) noted that some colonies have only large individuals, whereas others have only small individuals, and some colonies had both in varying proportions. Despite some assortive mating where both sizes occur, there are also mixed pairs that hybridise and show no decrease in breeding success. Brooke (2004) maintained the species as monotypic – a treatment accepted here.

Such action obviates the confusion regarding the correct names for the two subspecies (see, for example, varying usages in Watson (1977), Jouanin and Mougin (1979), Croxall (1982), Harrison (1985), Jouventin and Viot (1985), Haftorn *et al.* (1988), Marchant and Higgins (1990), Turbott (1990), Carboneras (1992b) and Dickinson (2003). If subspecies are accepted, it is nominate *nivea* (*sensu* Sibley and Monroe 1990) that occurs at Davis Base, Antarctica, (Marchant and Higgins 1990). Thus, birds occurring in the waters around Heard and Macquarie Islands are probably this form. Apparent records from waters off the Australian mainland have not been accepted to date (Marchant and Higgins 1990). The subspecific identity of these is not likely to be determinable at sea.

Imber (1985) revised the relationships within *Pterodroma* (gadfly petrels) and recognised two further genera: monotypic *Lugensa* for *brevirostris* (Kerguelen Petrel) and *Pseudobulweria* for *rostrata* (Tahiti Petrel), *aterrima* (Mascarene Petrel), and *macgillivrayi* (Macgillivray's Petrel). This separation was based on an analysis of several external and anatomical characters, with particular emphasis on the coiling of the intestine – simple in *Pseudobulweria* and *Lugensa* and helicoidal in *Pterodroma*. The value of this character has been questioned because starved procellariiforms also have straight intestines (Kuroda 1986). How many starved, beachcast birds were included in Imber's sample of *Lugensa* and *Pseudobulweria* was not indicated. *Pseudobulweria* and *Lugensa* have also been shown to be distinguishable from *Pterodroma* on skeletal characters (Imber 1985; Meredith 1985). Turbott (1990), Sibley and Monroe (1990), Christidis and Boles (1994), Dickinson (2003) and Brooke (2004) recognised both genera. Warham (1990) retained *Pseudobulweria* in *Pterodroma*, while Marchant and Higgins (1990) and Carboneras (1992b) recognised only *Pterodroma*. Sibley and Monroe (1993) subsequently included *Lugensa* and

Pseudobulweria in *Pterodroma*, without explanation. Imber (1985) proposed that *Lugensa* was more closely allied to the fulmarines than to *Pterodroma*, while he considered *Pseudobulweria* to be most closely linked to *Procellaria*.

In a study of cytochrome-*b* DNA sequences, Nunn and Stanley (1998) confirmed that *Lugensa brevirostris* was not part of *Pterodroma*, but neither was it allied with the fulmarines. Their data indicated that this taxon is more closely related to the shearwaters *Calonectris* and *Puffinus*.

Nunn and Stanley (1998) had no representatives of any members of the *Pseudobulweria* group in their study. Bretagnolle *et al*. (1998) examined the phylogenetic relationships of *Pseudobulweria* and *Bulweria* using sequence data from a portion (496 base pairs) of the cytochrome-*b* gene. Their analysis indicated that *Pseudobulweria* is not part of *Pterodroma*, but is most closely related to *Puffinus* and *Calonectris*. Penhallurick and Wink (2004) incorporated the *Pseudobulweria* sequences of Bretagnolle *et al*. (1998) in their re-analysis of the Nunn and Stanley (1998) data. They, instead, concluded that *Pseudobulweria* is more closely related to the petrels *Bulweria* and *Procellaria*.

The position of *Bulweria* was poorly resolved in the study by Bretagnolle *et al*. (1998) but it appeared closest to *Procellaria*. A sister relationship between *Bulweria* and *Procellaria* was supported by the DNA analyses of Nunn and Stanley (1998) and in the subsequent re-investigation by Penhallurick and Wink (2004).

Three species names have been applied to the Kerguelen Petrel: *lugens* (Kuhl, 1820), *brevirostris* (Lesson, 1833) and *kidderi* (Coues, 1875). Mathews (1942) proposed the subgenus *Lugensa* for '*Pterodroma brevirostris*, now known as *P. lugens*'. Bourne and Elliott (1965) argued that the type of *lugens* was indeterminate and recommended adoption of *brevirostris*, and this recommendation was followed by subsequent authors (e.g. Mougin 1979; Marchant and Higgins 1990; Sibley and Monroe 1990; Carboneras 1992b; Christidis and Boles 1994; Dickinson 2003; Brooke 2004). Olson (2000) argued that if the specific name *lugens* could not be identified, then the generic name *Lugensa* automatically became invalid, and consequently proposed the new replacement name *Aphrodroma*. Bourne (2001) maintained that *Lugensa* was still valid given that Mathews (1942) was referring to the species 'formerly called *Pterodroma brevirostris*'. Olson's argument regarded this as implying that *brevirostris* was a junior synonym of *lugens*. Brooke (2004) retained *Lugensa* while other authors (e.g. Dickinson 2003) have preferred *Aphrodroma*. *Lugensa brevirostris* is retained here, but this issue stills requires resolution.

In the analyses by Nunn and Stanley (1998) and Penhallurick and Wink (2004), the 18 species of *Pterodroma* for which there are complete cytochrome-*b* data formed a monophyletic assemblage. Unfortunately, these studies lacked several species relevant to Australia: *P. baraui* (Barau's Petrel), *P. arminjoniana* (Trinidade Petrel), *P. heraldica* (Herald Petrel), *P. leucoptera* (Gould's Petrel), *P. cervicalis* (White-necked Petrel), *P. occulta* (Vanuatu Petrel) and *P. pycrofti* (Pycroft's Petrel). Internal groupings within this assemblage recovered by these studies did not support the subgenera proposed by Imber (1985). Penhallurick and Wink (2004) suggested a tentative subgeneric revision for *Pterodroma* but, given the limited coverage of taxa in the DNA analyses, it is not adopted here at this time. The sequence of species here follows that indicated by DNA-based phylogeny, with the missing species inserted next to those species with which they are conventionally associated.

Bretagnolle *et al*. (1998) obtained cytochrome-*b* sequence data for *Pseudobulweria rostrata rostrata*, *P. r. trouessarti* and *P. aterrima*. No data were obtained for *P. r. becki* or *P. macgillivrayi*. Divergence between *P. r. rostrata* and *P. r. trouessarti* was 0.6%, while that between *P. r. rostrata* and *P. aterrima* and between *P. r. trouessearti* and *P. aterrima* was 5.6% and 5%, respectively. *Pseudobulweria rostrata* and *P. aterrima* have sometimes been treated as conspecific (mentioned by Carboneras 1992b), but the DNA data support separate species treatment for both (as in Dickinson 2003 and Brooke 2004). Imber (1985), McAllan and Bruce (1988), Sibley and Monroe (1990), Dickinson (2003) and Brooke (2004) also recognised *P. becki* (Beck's Petrel) as a species separate from *P. rostrata*; Brooke (2004) based this tentative action on the size difference between *becki* and *rostrata*. Other authors have regarded *becki* as a subspecies of *rostrata* (Jouanin and Mougin 1979; Harrison 1985; Marchant and Higgins 1990; Carboneras 1992b; Christidis and Boles 1994), and this is maintained here. McAllan and Bruce (1988) mentioned an unverified record of *becki* (cited as *P. becki*) from the New South Wales coast; this was omitted by Christidis and Boles (1994) from their supplementary list.

Jouanin and Moulin (1979) included the taxa *feae* and *madeira* within *Pterodroma mollis* (Soft-Plumaged Petrel). Most authors (e.g. Bourne 1983; Imber 1985; Sibley and Monroe 1990; Carboneras 1992b; Dickinson 2003; Brooke 2004) since have treated these as separate species: *P. feae* (Cape Verde Petrel) and *P. madeira* (Madeira Petrel). From detailed analyses of morphology, behaviour and vocalisations, Bretagnolle (1995) concluded that *P. mollis* and *P. feae* were certainly different species, and although retaining *madeira* within the latter, he suggested that morphologically it was sufficiently different to also warrant species status.

Imber (1985) and Sibley and Monroe (1990) treated *Pterodroma heraldica* as a separate species from *P. arminjoniana*, but this has not been the common practice (e.g. Jouanin and Mougin 1979; Bourne 1987a; Marchant and Higgins 1990; Warham 1990; Carboneras 1992b; Christidis and Boles 1994), and indeed Sibley and Monroe (1993) subsequently combined the two. The English name used for *P. arminjoniana* when *heraldica* is included is Herald Petrel (e.g. Marchant and Higgins 1990; Warham 1990; Carboneras 1992b; Christidis and Boles 1994; Dickinson 2003).

Brooke and Rowe (1996) combined an analysis of breeding behaviour, plumage pattern and cytochrome-*b* DNA sequences (307-base-pair fragment) to investigate the taxonomy of the *P. arminjoniana-heraldica* complex. Sequence divergences between the various forms, including *P. alba* (Phoenix Petrel), were generally less than 1%. Individuals of *arminjoniana* sampled came from the Indian Ocean population (Round Island); those from the Atlantic breeding population (Trindade and Martin Vaz Islands) were not sequenced. Individuals of *heraldica* used in the study were from the Pitcairn Group (Henderson and Ducie Islands).

Brooke and Rowe (1996) argued that *arminjoniana* and *heraldica* were also best treated as separate species, based on consideration of genetic and morphological differentiation and the observation that the dark and light forms of *arminjoniana* on Round Island did not mate assortatively. Comparative data for the Atlantic Ocean populations were not available. Within the Australian region, the breeding population on Raine Island is the white-bellied form, corresponding to *P. heraldica sensu* Brooke and Rowe (1996).

Reappraisals are needed of reports of *heraldica*-type birds from the Australian region. Birds at North Keeling Island were regarded as *P. arminjoniana* by Stokes and Goh (1987). Nonetheless, it, and other records documented with either photographs or specimens, appears to be referable to *heraldica* (*sensu stricto*) – the only species included here. Observations of a dark plumaged bird in the Coral Sea (Marchant and Higgins 1990) and an intermediate one off Ballina NSW (Izzard and Watson 1980) require further evaluation.

Pterodroma externa (Juan Fernandez Petrel) and *P. cervicalis* (White-necked Petrel) are sometimes combined as a single species, under the former name (Jouanin and Mougin 1979; Warham 1990), but they are now usually treated as separate species (Imber 1985; Marchant and Higgins 1990; Turbott 1990; Sibley and Monroe 1990; Carboneras 1992b; Christidis and Boles 1994; Dickinson 2003;

Brooke 2004). This latter approach is maintained here.

Imber and Tennyson (2001) described the breeding population of *Pterodroma cervicalis* from Vanuata as a new species – *P. occulta* (Vanuatu Petrel) – and designated a specimen of *P. cervicalis* from northern New South Wales (Boles *et al*. 1985) as a paratype. *Pterodroma occulta* was described on the basis of some slight plumage differences and by its smaller size relative to *P. cervicalis*. Imber and Tennyson (2001) did not discuss why they believed *occulta* represented a new species and not a new subspecies of *P. cervicalis*, to which they acknowledged it was most closely related. Dickinson (2003) accepted *P. occulta* at specific level, whereas Brooke (2004) regarded it as conspecific with *P. cervicalis*. The level of morphological differentiation between these forms is comparable to that exhibited by other closely related members of this genus. *Pterodroma occulta* is tentatively accepted for this list as a species separate from *P. cervicalis*. Its specific status requires further review, as does the appropriateness of the English name, since breeding in Vanuatu awaits confirmation. Imber and Tennyson (2001) suggested that both *occulta* and *cervicalis* occur in eastern Australian seas, and this has been subsequently confirmed by specimens.

A record of *Pterodroma incerta* (Atlantic Petrel) from off the Victorian coast (Dooley 2005b) has been accepted (BARC 457) since Christidis and Boles (1994), so this species is moved from the supplementary list to the main list. Another report is under consideration (Dooley 2006d). An apparent record of *P. pycrofti* south of Lord Howe Island has never been confirmed (Marchant and Higgins 1990). Jouanin and Mougin (1979) and Warham (1990) retained *pycrofti* as a subspecies of *P. longirostris* (Stejneger's Petrel), but the general consensus is to treat it as a separate species (Imber 1985; Marchant and Higgins 1990; Turbott 1990; Sibley and Monroe 1990; Roberson and Bailey 1991; Dickinson 2003; Brooke 2005). This species is retained on the supplementary list. Subfossil remains of a small petrel have been found on Lord Howe Island (Bourne 1974; Meredith (1991) and have been assumed to refer to *P. pycrofti* (McAllan *et al*. 2004).

Although Imber (1985), Sibley and Monroe (1990), Spear *et al*. (1992) and Brooke (2004) treated *Pterodroma brevipes* (Collared Petrel) as a distinct species from *P. leucoptera*, most authors have treated it as a subspecies (Jouanin and Mougin 1979; Marchant and Higgins 1990; Warham 1990; Carboneras 1992b; Dickinson 2003). To date, apparent records of *brevipes* from Australian waters are unconfirmed (McAllan and Bruce 1989), but recent sightings near Norfolk (Dooley 2007b) await assessment by BARC.

Jouanin and Mougin (1979) recognised five species of prion *Pachyptila*: *vittata* (Broad-billed Prion; including *salvini*, Salvin's Prion), *desolata* (Antarctic Prion), *belcheri* (Slender-billed Prion), *turtur* (Fairy Prion) and *crassirostris* (Fulmar Prion). Harper (1980) treated *salvini* as a separate species, whereas Cox (1980) recognised only *P. turtur* (including *crassirostris*), *P. belcheri* and *P. vittata* (including *desolata* and *salvini*). Harrison (1985) followed Cox (1980), but most other authors (e.g. Bretagnolle *et al.* 1990; Marchant and Higgins 1990; Turbott 1990; Sibley and Monroe 1990; Christidis and Boles 1994; Dickinson 2003; Brooke 2005) have recognised six species as advocated by Harper (1980). Bretagnolle *et al.* (1990) suggested that *P. salvini macgillivrayi* may also represent a separate species. This form, which breeds only on Amsterdam and St. Paul Islands, may occur in the waters off Western Australia. Worthy and Jouventin (1999) compared osteological and bill measurements of *vittata*, *salvini* and *macgillivrayi*. As *macgillivrayi* was more similar to *vittata* in some characters and to *salvini* in others, Worthy and Jouventin (1999) argued that it was best to treat it as a separate species: Amsterdam Prion. The alternate view of combining all three taxa as one species is equally plausible.

Nunn and Stanley (1998) obtained cytochrome-*b* sequence data for *P. turtur*, *P. vittata*, *P. belcheri* and *P. salvini*. DNA distances (as calculated by Penhallurick and Wink 2004) revealed an average divergence of 1.2% among the last three and 3.5% between *P. turtur* and the rest. Based on comparisons of these distances with the protein allozyme data of Bretagnolle *et al.* (1990) for *P. turtur*, *P. desolata*, *P. belcheri* and *P. salvini*, Penhallurick and Wink (2004) argued that *belcheri*, *vittata*, *desolata* and *salvini* should all be combined as *P. vittata*. Without comparative genetic data from all the taxa and from a range of populations, it is premature to revise this assemblage solely on the DNA data. Although no genetic data were available for *P. crassirostris*, Penhallurick and Wink (2004) accepted the morphological assessments of Cox (1980) and included it within *P. turtur*. Both species, however, breed on Snares Islands (Marchant and Higgins 1990), with no reported hybridisation.

The prevailing view of recognising six species in *Pachyptila* is tentatively maintained here, with *macgillivrayi* as a subspecies of *P. salvini*.

Within the Australian region, *Pachyptila crassirostris flemingi* breeds on Heard Island (see Tennyson and Bartle 2005 for use of this name). A specimen found in Tasmania in 1995 has been accepted as representing *P. crassirostris* and probably the nominate race (BARC 198). Other records of this species from Australia were found to be erroneous or have not been substantiated (Cox 1980; Marchant and Higgins 1990, cf. Condon 1975).

Bourne (1987b) considered *Bulweria fallax* (Jouanin's Petrel) to be a larger subspecies of *B. bulweria* (Bulwer's Petrel). Zonfrillo (1988), however, noted that each had its own species of *Halipeurus* feather lice and recommended that these taxa be treated as separate species; this has been accepted by most subsequent authors (Marchant and Higgins 1990; Sibley and Monroe 1990; Carboneras 1992b; Dickinson 2003; Brooke 2004). This treatment is maintained here. Records of *B. fallax* from Australian waters near Ashmore and Scott Reefs have been accepted (BARC 349, 363, 458).

Procellaria aequinoctialis (White-chinned Petrel), *P. westlandica* (Westland Petrel) and *P. parkinsoni* (Black Petrel) are alternatively regarded as forming a subgenus, superspecies or even single species (e.g. Jouanin and Mougin 1979; Sibley and Monroe 1990; Carboneras 1992b). Wolters (1975-1982) resurrected the monotypic genus *Adamastor* for the fourth member of *Procellaria*: *P. cinerea* (Grey Petrel). DNA distances (Penhallurick and Wink 2004), based on the cytochrome-*b* data of Nunn and Stanley (1998), supported recognition of all species, with distances ranging from 4% to 4.7%. Furthermore, these data did not place *P. cinerea* as the most distinct member. A sister species relationship was apparent between *P. cinerea* and *P. westlandica* with *P. aequinoctialis* as the earliest diverged member of the genus. The species sequence adopted here reflects this pattern of relationships.

Often included as a subspecies of *Procellaria aequinoctialis*, *P. conspicillata* (Spectacled Petrel) was shown by Ryan (1998) to warrant specific recognition on the basis of differences in vocalisations. McAllan (2002) discussed early Australian records of petrels published under this name. This species has not yet been definitely recorded in Australia.

Two genera of shearwaters are generally recognised: *Puffinus* and *Calonectris* (e.g. Jouanin and Mougin 1979; Harrison 1985; Sibley and Monroe 1990; Marchant and Higgins 1990; Carboneras 1992b; Christidis and Boles 1994; Dickinson 2003; Brooke 2004), although Wolters (1975–1982) also accepted *Ardenna* (for *pacificus* and *bulleri*) and *Thyellodroma* (for *gravis* and *carneipes–creatopus*). Austin (1996) investigated relationships within *Puffinus* through examination of a 307 base pair portion of the cytochrome-*b* gene. Two distinct lineages were identified: (1) *pacificus* (Wedge-tailed Shearwater), *bulleri* (Buller's Shearwater), *carneipes* (Flesh-footed Shearwater), *creatopus* (Pink-footed Shearwater), *gravis* (Great Shearwater), *griseus* (Sooty Shearwater) and *tenuirostris* (Short-tailed Shearwater) and (2) the remaining species of *Puffinus*. The second lineage corresponds to the *Puffinus* subgroup identified by Kuroda (1954) on the basis of osteological, behavioural and biogeographical considerations. The other four subgroups (*Neonectris*, *Ardenna*, *Hemipuffinus* and *Thyellodroma*) distinguished by Kuroda (1954) constitute the first lineage. The only conflict was that Kuroda (1954) linked *P. nativitatis* (Kiritmati Shearwater) with *P. griseus* and *P. tenuirostris* in the subgroup *Neonectris*, whereas the DNA data placed *nativitatis* in the second lineage and did not support a sister relationship between *P. griseus* and *P. tenuirostris*. (Note that Kirimati Shearwater, rather than Christmas Island Shearwater, is adopted because the geographic name Christmas Island is now generally restricted to the island in the Indian Ocean and Kirimati to the island in the Pacific from which this species comes; Dickinson 2003). In a further study using the cytochrome-*b* gene, Heidrich *et al*. (1998) found that lineage 2 (*Puffinus* subgroup) was more closely linked to *Calonectris* than to lineage 1.

The complete cytochrome-*b* sequence data (1043 base pairs) of Nunn and Stanley (1998) identified the same two lineages within *Puffinus*, and again these did not form a monophyletic group with respect to *Calonectris*. Consequently, two taxonomic options exist. Either *Calonectris* can be combined with *Puffinus* or the two lineages of *Puffinus* should be recognised as separate genera, while retaining *Calonectris*. Based on the level of genetic differentiation between the lineages, Penhallurick and Wink (2004) opted for the second option and restored the genus *Ardenna* Reichenbach, 1853, for lineage 1, restricting *Puffinus* to lineage 2. Recognition of *Ardenna* is accepted here, with the appropriate changes in endings of the specific epithets *pacifica* and *grisea* (but not *creatopus* – a noun in apposition).

The DNA data supported a sister relationship between *pacifica* and *bulleri* (Austin 1996; Nunn and Stanley 1996; Penhallurick and Wink 2004). Based on the low level of DNA divergence (0.7%), Penhallurick and Wink (2004) included *creatopus* as a subspecies of *A. carneipes* – as was done by Bourne (1962), who noted that the populations of the two did not show uniform variation in colour and size. Similarly, Wolters (1975–1982) accepted a single species. Most recent authors (e.g. Dickinson 2003; Brooke 2004) continue to recognise two species, although without commenting on this issue. Based on the DNA assessments, in conjunction with morphological evidence, retention of *creatopus* as separate from *P. carneipes* is tentatively accepted here, although there is a strong possibility that this will need to be altered subsequently. *Puffinus creatopus* has been recorded as vagrant of the New South Wales coast (McBride 1989).

Murphy (1952) included eight forms in *Puffinus puffinus*: nominate *puffinus* (Manx Shearwater), *yelkouan* (Yelkouan Shearwater), *mauretanicus* (Balearic Shearwater), *opisthomelas* (Black-vented Shearwater), *auricularis* (Townsend's Shearwater), *newelli* (Newell's Shearwater), *huttoni* (Hutton's Shearwater) and *gavia* (Fluttering Shearwater). Jouanin and Mougin (1979) and Harrison (1985) separated both *huttoni* and *gavia* as species – an action followed by Marchant and Higgins (1990). Jehl (1982) concluded that *auricularis* was also a separate species, which included *newelli* as a well-marked subspecies. Sibley and Monroe (1990), followed by Carboneras (1992b), further separated as species *opisthomelas* and *yelkouan* (including *mauretanicus*). A study by Heidrich *et al*. (1996) using cytochrome-*b* also demonstrated that nominate *puffinus* and *yelkouan* were separate species. Heidrich *et al*. (1998), also employing cytochrome-*b* data, examined in detail the relationships among nominate *puffinus*, *yelkouan* and *mauretanicus* and concluded that all were best treated as separate species – the latter two as sister taxa.

DNA divergences calculated by Penhallurick and Wink (2004), based on the data of Heidrich *et al*. (1998, 2000) and Nunn and Stanley (1998), also supported species status for *puffinus*, *yelkouan*, *mauretanicus*, *huttoni* and *opisthomelas*. DNA divergence data were lacking for *auricularis*, *newelli* or *gavia* in this analysis; however, there were data for *newelli* and *gavia* in Austin (1996). He found that *gavia* was diverged 4.4% from both *puffinus* and *huttoni*, while *newelli* was diverged 3% from *puffinus*, thereby supporting species status for each taxon. Further work is needed to resolve whether *newelli* comprises a separate species from *P. auricularis*. Brooke (2004) accorded *newelli* specific status, whereas AOU (1998) and Dickinson (2003) regarded it as conspecific with *P. auricularis*. No DNA data exist for *auricularis* to allow a direct comparison. As seven of the forms included in *P. puffinus* by Murphy (1952) are best treated as separate species, it is logical to tentatively treat the remaining one – *auricularis* – at specific level as well until this can be tested, and this is done here.

McAllan and Bruce (1989) misquoted Carter (1988) regarding the identity of a photograph of a *Puffinus* species from Australian waters in Lindsey (1987: p. 303). Carter (1988) suggested that the bird might represent *P. puffinus* and pointed out characters that it shared with *newelli*, but without implying the bird could be the latter species. Given that the record was based on an incorrect citation of Carter (1988), it was not included in the supplementary list of Christidis and Boles (1994). However, a recent record of *P. newelli* from Phillip Island, off Norfolk Island has been accepted (BARC 246).

Austin (1996), in his cytochrome-*b* study, included three of the seven subspecies of *Puffinus assimilis* (Little Shearwater) recognised by Jouanin and Mougin (1979) (*assimilis*, *haurakiensis*, *baroli*). *Puffinus a. assimilis* and *P. a. haurakiensis* were 3% diverged from one another, whereas the DNA sequence of *P. a. baroli* was identical to that of *P. lherminieri boydi*.

Several issues are raised by these results. Firstly, there is debate as to whether the taxon *boydi* is best placed in *P. assimilis* (e.g. Carboneras 1992b) or in *P. lherminieri* (e.g. Jouanin and Mougin 1979). According to the DNA divergences, *boydi* is more closely related to *P. lherminieri* (1%) than to *P. assimilis* (3%). Secondly, there are identical sequences between *baroli* and *boydi*. Austin (1996) suggested that hybridisation, incomplete lineage sorting during speciation of the *P. assimilis–lherminieri* complex or mislabelling of the samples could be responsible for this result. Heidrich *et al.* (1998), however, examined two more individuals of *baroli* from Madeira and compared their sequences to those of the *baroli* samples of Austin (1996), which came from Tenerife, Canary Islands. There were only two base pair differences between the sequences, which is consistent with expectations for geographic variation within a species. This implies that both *baroli* and *boydi* are best treated as subspecies of *P. lherminieri*. Their transfer means that the distribution of *P. assimilis* is confined to the Southern Hemisphere. Thirdly, the suggestion by Vaurie (1965) that *P. lherminieri* and *P. assimilis* are conspecific is rejected by the DNA sequence data.

Austin (1996) found 3% genetic divergence between *P. a . assimilis* and *P. a. haurakiensis*, which is comparable to other species level divergences in *Puffinus*. This suggests that the two taxa should be treated as separate species. If this action were taken, the question remains regarding the allocation of the remaining four subspecies (*tunneyi*, *kermadecensis*, *elegans* and *myrtae*).

Using a greater taxon sampling and more base pairs of the cytochrome-*b* gene, Austin *et al.* (2004) extended the previous study. The results confirmed the inclusion of *baroli* and *boydi* in *P. lherminieri*. These authors considered *tunneyi*, *kermadecensis*, *elegans* and *haurakiensis* to be subspecies of *P. assimilis* (divergences of 0.7–3.3%), but the putative subspecies *myrtae* was shown to form a group with *P. newelli*. In the Australian region, *tunneyi* (south-western Australia) and *assimilis* (Lord Howe and Norfolk Islands) are present.

Holdaway *et al.* (2001) treated *kermadecensis* (Kermadec Island Little Shearwater) and *haurakiensis* (North Island Little Shearwater), together with nominate *assimilis* (Norfolk Island Little Shearwater), as species separate from the other forms. No supporting case for these actions was presented, nor were comments made on the taxonomic status of *tunneyi*, *elegans* and *myrtae*.

The arrangement adopted here for the *assimilis* complex follows the conclusions of Austin *et al.* (2004).

The four species of diving-petrel are generally thought to comprise two groups (Marchant and Higgins 1990; Carboneras 1992b): (1) *Pelecanoides georgicus* (South Georgian Diving-Petrel), *P. magellani* (Magellanic Diving-Petrel) and *P. garnotii* (Peruvian Diving-Petrel) and (2) *P. urinatrix* (Common Diving-Petrel). The DNA sequence data of Nunn and Stanley (1998) placed *P. georgicus* and *P. magellani* as sister species and these, in turn, were linked to *P. urinatrix* – with *P. garnotii* as the most divergent species.

Six subspecies of *Pelecanoides urinatrix* are generally recognised (Marchant and Higgins 1990; Carboneras 1992b): *urinatrix*, *chathamensis*, *exsul*, *dacunhae*, *berard* and *coppingeri*. Two of these are recorded from the Australian region, *urinatrix* (south-eastern Australia) and *exsul* (Heard and Macquarie Islands). Murphy and Harper (1921) treated *exsul* as a distinct species, but this has not been followed subsequently. Bourne (1968) considered *coppingeri* and *exsul* to be doubtfully distinct, and likewise *chathamensis* and *dacunhae*. On the presumption that *urinatrix* and *chathamensis* might breed sympatrically on the Chatham Islands, he suggested that the complex should be split into two species: subtropical *P. urinatrix* and subantarctic *P. berard* (comprising *chathamensis*, *exsul*, *dacunhae*, *berard* and *coppingeri*). Further evidence to support this treatment has not appeared, but the issue merits further investigation. It is worth noting that size variation within *exsul* exceeds that between *urinatrix* and *chathamenis* (which are separated largely on the basis of size) (Rogers 1990b).

The argument that the species name *Pelecanoides urinatrix*, rather than *P. urinator*, was correct was confirmed by David and Gosselin (2002a).

Macronectes giganteus	Southern Giant-Petrel
Macronectes halli	Northern Giant-Petrel
Fulmarus glacialoides	Southern Fulmar
Thalassoica antarctica	Antarctic Petrel
Daption capense	Cape Petrel
Pagodroma nivea	Snow Petrel$^{H/V}$
Halobaena caerulea	Blue Petrel
Pachyptila vittata	Broad-billed Prion
Pachyptila salvini	Salvin's Prion
Pachyptila desolata	Antarctic Prion
Pachyptila belcheri	Slender-billed Prion
Pachyptila turtur	Fairy Prion
Pachyptila crassirostris	Fulmar Prion^{V,H}
Procellaria aequinoctialis	White-chinned Petrel
Procellaria westlandica	Westland Petrel^{V}
Procellaria parkinsoni	Black Petrel
Procellaria cinerea	Grey Petrel
Bulweria bulwerii	Bulwer's Petrel^{V}
Bulweria fallax	Jouanin's Petrel^{V}
Ardenna pacifica	Wedge-tailed Shearwater
Ardenna bulleri	Buller's Shearwater
Ardenna carneipes	Flesh-footed Shearwater
Ardenna creatopus	Pink-footed Shearwater^{V}
Ardenna gravis	Great Shearwater^{V}
Ardenna grisea	Sooty Shearwater
Ardenna tenuirostris	Short-tailed Shearwater
Calonectris leucomelas	Streaked Shearwater
Puffinus puffinus	Manx Shearwater^{V}
Puffinus newelli	Newell's Shearwater^{V}
Puffinus gavia	Fluttering Shearwater
Puffinus huttoni	Hutton's Shearwater
Puffinus lherminieri	Audubon's Shearwater^{V}
Puffinus assimilis	Little Shearwater
Pseudobulweria rostrata	Tahiti Petrel
Lugensa brevirostris	Kerguelen Petrel
Pterodroma baraui	Barau's Petrel^{V}
Pterodroma externa	Juan Fernandez Petrel^{V}
Pterodroma neglecta	Kermadec Petrel^{V,LH,N}
Pterodroma heraldica	Herald Petrel
Pterodroma mollis	Soft-plumaged Petrel
Pterodroma lessonii	White-headed Petrel
Pterodroma macroptera	Great-winged Petrel
Pterodroma solandri	Providence Petrel
Pterodroma inexpectata	Mottled Petrel
Pterodroma leucoptera	Gould's Petrel
Pterodroma brevipes	Collared Petrel$^{S(N)}$
Pterodroma cookii	Cook's Petrel^{V}

Pterodroma cervicalis	White-necked Petrel^{V,N}
Pterodroma occulta	Vanuatu Petrel^{V}
Pterodroma nigripennis	Black-winged Petrel
Pterodroma incerta	Atlantic Petrel^{V}
Pterodroma pycrofti	Pycroft's Petrel$^{S(LH)}$
Pelecanoides urinatrix	Common Diving-Petrel
Pelecanoides georgicus	South Georgian Diving-Petrel^{V,H}

ORDER SPHENISCIFORMES

Family Spheniscidae

Christidis and Boles (1994) listed 12 species of penguins, only one of which breeds on the mainland. Several breed only on island territories and the remainder were included only as vagrants or accidental visitors.

In a study of the musculature, Schreiweis (1982) found that *Aptenodytes* and *Pygoscelis* occupied basal positions relative to the remaining taxa. An analysis of osteological characters by O'Hara (1989) placed *Aptenodytes* and *Pygoscelis* as sister lineages and linked these to the *Eudyptes–Megadyptes* group, with *Eudyptula* and *Spheniscus* forming a separate clade.

Ritchie (2001) examined DNA sequences (985 base pairs) from the mitochondrial 12S and 16S RNA genes to examine phylogenetic relationships among 17 species of penguins listed by Sibley and Monroe (1990) and Martínez (1992). The basal divergence was between *Aptenodytes* (King and Emperor Penguins) and the remaining taxa. The next lineage to split was *Pygoscelis* (Adélie, Chinstrap and Gentoo Penguins). The remaining clade comprises three lineages: (1) *Eudyptes* (crested penguins) and *Megadyptes* (Yellow-eyed Penguin, (2) *Eudyptula* (Little Penguin) and (3) *Spheniscus* (Black-footed, Magellanic, Peruvian and Galapagos Penguins). Relationships among these lineages were not resolved, but in some analyses *Eudyptula* was linked to *Spheniscus*. This branching sequence was consistent with that obtained by DNA–DNA hybridisation (Sibley and Ahlquist 1990), including a sister relationship between *Eudyptula* and *Spheniscus*. Paterson *et al.* (1995) also reported DNA sequences (12S RNA gene) for *Pygoscelis*, *Eudyptes*, *Megadyptes* and *Eudyptula* – the pattern of relationships observed was identical to that of Ritchie (2001).

Giannini and Bertelli (2004) employed 70 integumentary and breeding characters to test the phylogeny of living penguins. They recovered a well-supported clade of *Eudyptula* and *Spheniscus* and another of *Eudyptes* and *Megadyptes*. *Eudyptula–Spheniscus* were the sister group to the remaining penguins, followed by *Aptenodytes*, *Pygoscelis* and *Eudyptes–Megadyptes*. Bertelli and Giannini (2005) later expanded this data set to include osteological, and other morphological, characters (159 in total) and obtained similar results, except that *Aptenodytes–Pygoscelis* formed a sister clade to the *Eudyptes–Megadyptes*. These data were then combined with those from mitochondrial sequences. *Aptenodytes* came out as the sister taxon to the remaining penguins, with *Pygoscelis* being the next divergence. *Eudyptes–Megadyptes* and *Spheniscus–Eudyptula* were sister clades. Baker *et al.* (2006) obtained similar results using extensive multi-gene sequences (one nuclear; four mitochondrial). Ksepka *et al.* (2006) extended this further by incorporating fossil forms with the morphological and molecular findings of these studies. Generic relationships in the phylogeny resulting from this combined data set had the same topology as that of Baker *et al.* (2006). The sequence adopted here reflects the phylogeny of Baker *et al.* (2006) and Bertelli and Giannini 2005, and is consistent with that of Christidis and Boles (1994).

David and Gosselin (2002b) pointed out that *Pygoscelis* is masculine and the correct spelling of the specific epithet of Chinstrap Penguin is *antarcticus*, *contra* Condon (1975), Marchant and Higgins (1990), Christidis and Boles (1994) and others.

The DNA sequence data of Ritchie (2001) offer important insights into the species taxonomy of *Eudyptes*. He did not discuss the taxonomic implications of his work, but some emanate from his findings. Ritchie's (2001) DNA sequences from the highly conserved 12S RNA and 16S RNA genes provided little resolution at the species level with 0–4% variation between congeneric species. His sequences of the hypervariable region of the mitochondrial control region (which generally evolves 4 to 10 times faster than the cytochrome-*b* gene) showed intergeneric levels of variation from 4% to 21.5%. In both sets of data, the highest divergences between congeneric species were recorded in *Pygoscelis*. Within *Eudyptes*, the two lowest divergence recorded were between *chrysolophus* and *schlegeli* (4%) and *pachyrhynchus* and *robustus* (6.5%). Divergences for all other species comparisons ranged 10.7% to 15.3%. Of particular note were the divergences between *sclateri* and *pachyrhynchus* (12.0%) and between *sclateri* and *robustus* (12.9%). These three taxa were identified as a monophyletic clade in the phylogenetic analyses.

Falla and Mougin (1979), followed by Turbott *et al.* (1990), treated *Eudyptes schlegeli* (Royal Penguin) as a subspecies of *E. chrysolophus* (Macaroni Penguin), although most subsequent authors kept the two as separate species (e.g. Marchant and Higgins 1990; Sibley and Monroe 1990; Marchant and Higgins 1990; Martínez 1992; Williams 1995; Dickinson 2003). Both *Eudyptes schlegeli* and Indian Ocean populations of *E. chrysolophus* are polymorphic. Some of the corresponding morphs of these species have no consistent morphological or plumage differences (Shaughnessy 1975; Barré *et al.* 1976; Jouventin 1982; Rogers 1990c), and identification can be based only on breeding locality. Christidis and Boles (1994) noted that further study was required to determine if the extensive polymorphism of *E. schlegeli* was due to hybridisation with *E. chrysolophus*. Pending such study, they considered it inappropriate to recognise the two as separate species given the lack of consistent identifying characters for distinguishing them. The low level of genetic divergence shown in Baker *et al.* (2006) is consistent with accepting a single species.

Use of the name *Eudyptes sclateri* Buller, 1888 for the Erect-crested Penguin instead of *Eudyptes atratus* Finsch, 1875 was discussed by Christidis and Boles (1994); see ICZN (1976). *Eudyptes sclateri* has been thought to form a superspecies with *E. pachyrhynchus* (Fiordland Penguin) and *E. robustus* (Snares Penguin) (e.g. Falla and Moulin 1979; Sibley and Monroe 1990; Martínez 1992), but Warham (1975) considered *E. sclateri* to be very distinct and not part of the superspecies.

Warham (1974) regarded *E. pachyrhynchus* and *E. robustus* as separate species on the basis of a lack of hybridisation in areas of sympatry. O'Brien (1990), however, noted that it would be difficult to recognise hybrids by plumage alone. Warham (1974) also commented that variation in underflipper and cheek-stripe patterns suggested possible gene flow between the two. Wolters (1975–1982) treated all as subspecies of *E. pachyrhynchus*. Most recent authors have retained all three as separate species (e.g. Falla and Mougin 1979; Marchant and Higgins 1990; Sibley and Monroe 1990; Turbott *et al.* 1990; Martínez 1992; Christidis and Boles 1994; Dickinson 2003).

The DNA data outlined above, in conjunction with previous taxonomic assessments based on plumage and soft-part patterns, indicate that *schlegeli* Finsch, 1876 should continue to be treated as a subspecies of *Eudyptes chrysolophus* Brandt, 1837, with Macaroni Penguin retained as the English name. This maintains the treatment in Christidis and Boles (1994). Baker *et al.* (2006) found the level of genetic divergence between *pachyrhynchus* and *robustus* to be comparable to that between *schlegeli* and *chrysolophus*. Together with other molecular studies, this indicates that *robustus* Oliver, 1953, should be included as a subspecies of *Eudyptes pachyrhynchus* G.R. Gray, 1845 (with Fiordland Penguin retained as the English name), while *E. sclateri* should be retained as a separate species. These actions are incorporated here.

Wolters (1975–1982) used the name *Eudyptes crestatus* Miller, 1784, for the

Rockhopper Penguin, but recent authors (e.g. Marchant and Higgins 1990; Sibley and Monroe 1990; Turbott *et al.* 1990; Martínez 1992; Christidis and Boles 1994; Dickinson 2003) have used *E. chrysocome* Forster, 1781, for this species, following Falla and Mougin (1979).

All three subspecies of *Eudyptes chrysocome* (*chrysocome*, *moseleyi, filholi*) have been recorded from Australia – the first two as vagrants and the third (*filholi*) as a breeding bird on Macquarie and Heard Islands (Marchant and Higgins 1990). Martínez (1992) noted that the validity of *filholi* as separate from nominate *chrysocome* has been questioned.

Jouventin (1982) segregated *moseleyi* (breeding north of the Antarctic Convergence) as a separate species from *chrysocome* and *filholi* (both breeding at or south of the Antarctic Convergence) based on differences in vocalisations. Jouventin *et al.* (2006) followed this with a more detailed investigation adding DNA sequences of the ND2 gene and mitochondrial control region to vocalisations, head ornamentation and timing of breeding. They concluded that *moseleyi* warranted recognition at specific level. Banks *et al.* (2007) extended examination of the relationships of these three taxa by using three different sections of the mitochondrial genome (portions of cytochrome-*b*, COI and 12S subunit). They reached a similar conclusion that *moseleyi* was a distinct species from *chrysocome*. In addition, they considered that *fiholi*, while the sister species to *chrysocome* (*sensu stricto*), should also be treated as a separate species.

Genetic distances between the northern and southern forms were about half that between *E. chrysocome* (*sensu lato*) and *E. chrysolophus*. The observed level of difference between northern and southern forms of *E. chrysocome* are comparable to those between the pairs *E. chrysolophus–schlegeli* and *E. pachyrhynchus–robustus* (Ritchie 2001), which are here treated as conspecific. In this list, *moseleyi* is tentatively retained as a subspecies of *E. chrysocome*.

Kinsky and Falla (1976) recognised six subspecies of *Eudyptula minor* (Little Penguin), of which five occur in New Zealand:

(1) *minor* (southern and western South Island, Stewart Island)
(2) *albosignata* (central-eastern South Island)
(3) *variabilis* (northern South Island, southern North Island)
(4) *iredalei* (northern North Island)
(5) *chathamensis* (Chatham Islands)
(6) *novaehollandiae* (southern Australia and Tasmania).

This subspecific arrangement has been followed by most authors (e.g. Falla and Mougin 1979; Marchant and Higgins 1990; Sibley and Monroe 1990; Martínez 1992; Dickinson 2003), but not all (e.g. Turbott *et al.* 1990), subsequent authors.

Meredith and Sin (1988a) re-analysed Kinsky and Falla's (1976) morphological data for the subspecies *albosignata*, *variabilis* and *iredalei* and concluded that the variation among these was clinal. Meredith and Sin (1988b) also interpreted their protein allozyme data for these three subspecies as representing clinal variation. These findings led Turbott *et al.* (1990) to combine all New Zealand subspecies as *minor*; they did not comment on the status of the Australian form *novaehollandiae*. Given that Meredith and Sin (1988a, b) examined only three of the five New Zealand subspecies, the action of Turbott *et al.* (1990) could be considered premature. Finsch (1874) described the form *E. albosignata* (White-flippered Penguin) as a species separate from the other New Zealand and Australian forms. Although most recent authors have only recognised a single species (e.g. Falla and Mougin 1979; Marchant and Higgins 1990; Sibley and Monroe 1990; Martínez 1992; Christidis and Boles 1994), Wolters (1975–1982) recognised *E. albosignata* and *E. minor* (including the remaining New Zealand and Australian forms) as separate species.

Banks *et al.* (2002) examined differentiation among the six forms of *E. minor* using

DNA sequences from three mitochondrial genes (12S RNA, cytochrome-*b* and hypervariable portion of the control region). Phylogenetic analyses revealed two distinct clades: (1) *novaehollandiae* and *minor* and (2) *iredalei, variabilis, albosignata* and *chathamensis*. Genetic divergences between these two clades were 2.6% (12S RNA), 4.0% (cytochrome-*b*) and 11.8% (control region). Baker *et al*. (2006) obtained differences between *minor* and *albosignata* that were at similar levels to those between the *Eudyptes* populations treated as conspecific (*schlegeli–chrysolophus* and *pachyrhynchus–robustus*; see above). Here a single species of *Eudyptula* is accepted, although more detailed studies are desirable.

Aptenodytes patagonicus	King Penguin^{V,M,H}
Aptenodytes forsteri	Emperor Penguin$^{H/V, M/V}$
Pygoscelis papua	Gentoo Penguin^{V,M,H}
Pygoscelis adeliae	Adelie Penguin$^{M/V,H/V}$
Pygoscelis antarcticus	Chinstrap Penguin$^{V,H/V}$
Eudyptes chrysocome	Rockhopper Penguin^{V,M,H}
Eudyptes pachyrhynchus	Fiordland Penguin
Eudyptes sclateri	Erect-crested Penguin^{V}
Eudyptes chrysolophus	Macaroni Penguin^{V,M,H}
Eudyptula minor	Little Penguin
Spheniscus magellanicus	Magellanic Penguin^{V}

ORDER PHALACROCORACIFORMES

In the present list, the sequence of families is different from that in Christidis and Boles (1994) and reflects recent findings on their relationships (see Higher-Level Avian Systematics). The Phaethontidae are removed from this order to a position in the Metaves. The Sulidae, Anhingidae and Phalacrocoracidae form a well-supported clade. The Fregatidae appears to be related to this clade and precedes it in the sequence. On the basis of the growing evidence that the family Pelecanidae has closer links with some traditional ciconiiform birds than other members of the 'pelecaniforms', it is transferred to the Ciconiiformes.

Family Fregatidae

Although early taxonomic studies recognised only two species of frigatebird – *Fregata aquila* and *F. ariel* (discussed by Orta 1992a) – five are now generally accepted: *F. aquila* (Ascension Frigatebird), *F. andrewsi* (Christmas Island Frigatebird), *F. magnificens* (Magnificent Frigatebird), *F. minor* (Great Frigatebird) and *F. ariel* (Lesser Frigatebird) (e.g. Dorst and Mougin 1979; Sibley and Monroe 1990; Orta 1992a; Dickinson (2003).

Sibley and Ahlquist (1990) recorded DNA–DNA hybridisation distances for three taxa and concluded that *F. ariel* and *F. magnificens* were closer to each other than either was to *F. minor*. In contrast, Kennedy and Spencer (2003) found that *F. ariel* was the earliest diverged species in the genus, based on an analysis of 1756 base pairs of mitochondrial DNA sequence. This finding is consistent with morphological assessments (summarised in Orta 1992a). Two species pairs were evident among the remaining four species: (1) *F. minor–andrewsi*; and (2) *F. aquila–magnificens*. Nelson (1976) noted that *minor* and *andrewsi* shared certain vocalisations that were absent in the other species. The species sequence adopted here differs from that in Christidis and Boles (1994), who followed Sibley and Monroe (1990), to reflect the mitochondrial DNA sequence data.

Fregata ariel	Lesser Frigatebird
Fregata minor	Great Frigatebird
Fregata andrewsi	Christmas Island Frigatebird^{C,V}

Family Sulidae

Peters (1931) recognised two genera in the Sulidae – *Sula* (gannets) and *Morus* (boobies) – a taxonomy which was followed by Condon (1975), but not by Dorst and Mougin (1979), Marchant and Higgins (1990) or Carboneras (1992c), who placed all species in *Sula*. Van Tets *et al*. (1988) provided a case for the separation of *Morus* and *Sula*, which are diagnosable from most major skeletal elements.

Olson and Warheit (1988) provided further osteological evidence for recognition of a separate genus *Papasula* for *abbotti* (Abbott's Booby). They argued that *Papasula* represented the first divergence in the Sulidae. Three genera were accepted Sibley and Monroe (1990) and Christidis and Boles (1994). Analysis of 807 base pairs of cytochrome-*b* DNA sequence by Friesen and Anderson (1997) supported the recognition of three genera and clearly identified *Papasula* as the sister group to *Morus*. The three genera are accepted here.

The three species of gannet – *Morus bassanus* (Northern Gannet), *M. capensis* (Cape Gannet) and *M. serrator* (Australasian Gannet) – have been sometimes treated as conspecific (discussed in Carboneras 1992c), but most authors have treated them as distinct species (e.g. Peters 1931; Dorst and Mougin 1979; Marchant and Higgins 1990; Sibley and Monroe 1990; Carboneras 1992c; Christidis and Boles 1994; Dickinson 2003). DNA sequence data (Friesen and Anderson 1997) identified *M. bassanus* as the most divergent member, differing by 5.7% sequence from the other two, which varied by only 1.7%. Within *Sula*, species-level divergences range from 3.7% to 7.9%, with one exception: *Sula nebouxii* (Blue-footed Booby) and *S. variegata* (Peruvian Booby) are only 0.7% diverged, so it could be argued that these two southern boobies are conspecific. Similarly, the relatively low genetic divergence between the two gannets *M. serrator* and *M. capensis* could indicate that these are also conspecific. For the present, they are retained here as recently diverged species. Detailed comparative behavioural and ecological study could help resolve the species issue.

The phylogeny of Friesen and Anderson (1997) identified *S. sula* (Red-Footed Booby) as the first diverged taxon in the genus, followed in turn by *S. leucogaster* (Brown Booby). *Sula dactylatra* (Masked Booby) was linked to the *S. nebouxii*–*S. variegata* group. The species sequence adopted here is modified from that in Christidis and Boles (1994) to reflect the DNA phylogeny.

Van Tets *et al.* (1988) considered that subfossil sulid remains on Lord Howe and Norfolk Islands belonged to a recently extinct species, *Sula tasmani* (Tasman Booby). They suggested that observations made by the members of the First Fleet may have been the last recorded sightings of this species. Holdaway *et al.* (2001) and Holdaway and Anderson (2001), however, claimed that *S. tasmani* was based on material from the upper size range of *Sula dactylatra* and did not represent a separate species. Van Tets *et al.* (1988) claimed that *tasmani* differed in its nesting preferences – using sand beaches rather than sea cliffs – but Holdaway and Anderson (2001) pointed out that other sulid species that normally nest on cliffs will nest at sea level when in situations where they are not disturbed by humans (see also Hawkins 1988). Christidis and Boles (1994) followed van Tets *et al.* (1988) in recognising *S. tasmani* for the Australian list, but here it is considered to be a junior synonym of *S. dactylatra*. As a result of this action, the name *tasmani* has priority over *fullagari*, which was the name subsequently given to the subspecies of Masked Booby from Lord Howe, Norfolk and Kermedec Islands (O'Brien and Davies 1990). Priddel *et al.* (2005) adopted this arrangement.

Morus capensis is accidental to Australia, but has been recorded breeding in colonies of *M. serrator* (references in Marchant and Higgins 1990; Patterson 1991) with scattered observations elsewhere along the coast (Marchant and Higgins 1990; BARC 421). *Papasula abbotti*, which is resident on Christmas Island, has been reported as a vagrant off the Western Australian coast (BARC 297) and Ashmore Reef (BARC 432).

Apart from changes in the sequence of species of *Sula* and the synonymisation of *tasmani*, no inclusions or other taxonomic changes have been made in the current list to the treatment in Christidis and Boles (1994).

Papasula abbotti	Abbott's Booby$^{V,C,A/V}$
Morus capensis	Cape Gannet^{V}
Morus serrator	Australasian Gannet
Sula dactylatra	Masked Booby
Sula sula	Red-footed Booby
Sula leucogaster	Brown Booby

Family Anhingidae

Peters (1931) and Vaurie (1965) recognised four species of *Anhinga*: *anhinga* (Anhinga; North and South America), *rufa* (African Darter), *melanogaster* (Oriental Darter) and *novaehollandiae* (Australasian Darter). Based on an analysis of osteological characters, Harrison (1978) recognised only *A. anhinga* and *A. melanogaster* (including *rufa* and *novaehollandiae* as subspecies). Condon (1975, following G. F. van Tets *in litt.*) and Dorst and Mougin (1979) also accepted only one Old World *Anhinga*. The last authors also synonymised *novaehollandiae* with *rufa*, despite the more commonly held view that *rufa* is the most distinct member of the complex (e.g. Saiff 1978; Sibley and Monroe 1990; Orta 1992b). Although McAllan and Bruce (1989) and Sibley and Monroe (1990) recognised four species in the genus, most recent authors have treated *rufa*, *melanogaster* and *novaehollandiae* as subspecies of *A. melanogaster* (e.g. Cramp and Simmons 1977; White and Bruce 1986; Marchant and Higgins 1990; Orta 1992b; Christidis and Boles 1994; Johnsgard 1993; Inskipp *et al.* 1996; Dickinson 2003).

Kennedy *et al.* (2005) used mitochondrial DNA sequence distance data for a selection of darters, cormorants and boobies in a comparison of phylogenetic methods. Although the study was not concerned with relationships in the Anhingidae, the data presented showed that *rufa* and *novaehollandiae* had diverged at a level comparable to that between species of cormorants or boobies. Accordingly, each is accepted at specific level. (Although not included in the dataset, *melanogaster* (*sensu stricto*) presumably is comparably distinct, and is so treated here.) The English name, Australasian Darter, is applied to *A. novaehollandiae* as this species occurs in Australia, New Guinea, the Lesser Sundas and the southern Moluccas.

Anhinga novaehollandiae	Australasian Darter

Family Phalacrocoracidae

Generic level classification of the cormorants has proved difficult. The number of genera recognised has varied from one to nine depending on the author (cf. Peters 1931; van Tets 1976; Dorst and Mougin 1979; Siegel-Causey 1988; Sibley and Monroe 1990; Johnsgard 1993; Dickinson 2003). Based on considerations of behaviour, ecology and anatomy, van Tets (1976) divided the cormorants into two genera: *Phalacrocorax* and *Leucocarbo*. He considered *fuscescens* (Black-faced Cormorant) to belong in *Leucocarbo*, and this was followed by RAOU (1978b). Recognition of *Leucocarbo* was not adopted by Dorst and Mougin (1979) nor Marchant and Higgins (1990), who continued to recognise only *Phalacrocorax*.

Siegel-Causey (1988) constructed a phylogeny for the Phalacrocoracidae based on an extensive range of osteological characters. He recognised nine clades, which were treated as genera. Sibley and Monroe (1990) adopted the sequence of Siegel-Causey (1988), but rejected the acceptance of nine genera because they considered that the DNA–DNA hybridisation data of Sibley and Ahlquist (1990) did not support such diversity in the family. Note that the DNA–DNA hybridisation distances recorded by Sibley and Ahlquist (1990) between species of *Phalacrocorax* (*sensu lato*) were no less than those obtained between genera of Ardeidae (*cf.* Sibley and Ahlquist 1990: fig. 366). Siegel-Causey (1988) identified two subfamilies: Phalacrocoracinae (cormorants) and Leucocarboninae (shags). According to this classification, all Australian species belonged to the Phalacrocoracinae, except for the blue-eyed shags (placed in *Notocarbo*: *verrucosus*, Kerguelen Shag; '*atriceps–nivalis–purpurascens*', Imperial Shag complex).

The placement of *fuscescens* in *Leucocarbo*, as advocated by van Tets (1976), was contradicted by the analyses of Siegel-Causey (1988), which kept this species in the Phalacrocoracinae. In its cranial pneumatisation, *fuscescens* seems to belong with the Phalacrocoracinae rather than the Leucocarboninae (Siegel-Causey 1989). Moreover, *fuscescens* has black feet like the Phalacrocoracinae, whereas the Leucocarboninae have pink or yellow feet, as pointed out by Kennedy *et al.* (1993). Following Siegel-Causey (1988), the Australian members of this subfamily were allocated to genera as follows:

- *fuscescens* in *Compsohalieus*
- *varius* (Pied Cormorant) and *sulcirostris* (Little Black Cormorant) in *Hypoleucos*
- *melanoleucos* (Little Pied Cormorant) in *Microcarbo*
- *carbo* (Great Cormorant) in *Phalacrocorax* (*sensu stricto*).

Although this was based on a larger and more explicit data set than other studies at the time, Christidis and Boles (1994) were reluctant to accept it fully because differences of classification between various authors involved not only taxonomic rank, but more significant discrepancies in the position of species and genera within the family. Consequently, Christidis and Boles (1994) accepted a compromise arrangement in which the two subfamilies recognised by Siegel-Causey (1988) were treated as genera *Phalacrocorax* and *Leucocarbo*. Such an action was also taken by Johnsgard (1993), whereas Orta (1992c) and Dickinson (2003) recognised only *Phalacrocorax*.

Kennedy *et al.* (2000, 2001) examined relationships among 23 species of cormorants using DNA sequence data from three mitochondrial genes (12S RNA, ATPase 6, ATPase 8). Their analyses did not support the division of the family into the subfamilies Phalacrocoracinae and Leucocarboninae as defined by Siegel-Causey (1988). Instead, these identified four principal lineages.

The first dichotomy is between *melanoleucos* and the other species examined. Peters (1931), van Tets (1976) and Siegel-Causey (1988) had segregated this species in a genus together with *pygmeus* (Pygmy Cormorant), *niger* (Little Cormorant) and *africanus* (Long-tailed Cormorant), collectively known as 'micro-cormorants'. In their DNA–DNA hybridisation study, Sibley and Ahlquist (1990) found the two represented members of the group (*melanoleucos* and *africanus*) diverged basally relative to the other cormorants examined. Given the concordance between the assessments of both morphological and DNA data, it is best to separate the species of 'micro-cormorants' generically as *Microcarbo* Bonaparte, 1855, following Siegel-Causey (1988).

The second lineage was monotypic and comprised *gaimardi* (Red-legged Cormorant; southern South America). Although it, too, is best separated into its own genus, no name is available. Bonaparte (1855) placed it and *punctatus* (Spotted Shag) in the genus *Stictocarbo*. The latter species was subsequently designated as the type of that genus.

The remaining species examined fell into two assemblages, which were in part congruent with the Phalacrocoracinae and Leucocarboninae as defined by Siegel-Causey (1988). Differences from the work were the placement of *auritus* (Double-crested Cormorant) and *brasilianus* (=*olivaceus*; Neotropic Cormorant; see Browning 1989) in the Leucocarboninae and *nigrogularis* (Socotra Cormorant) and *capensis* (Cape Cormorant) within the Phalacrocoracinae. Apart from *magellanicus* (Rock Shag) and *gaimardi* (discussed above), the remainder of the species included by Siegel-Causey (1988) in *Stictocarbo* were part of the Phalacrocoracinae and not the Leucocarboninae according to the DNA sequence data (Kennedy *et al.* 2000, 2001). In agreement with Siegel-Causey (1988), and *contra* van Tets (1976), *fuscescens* was found to be part of the Phalacrocoracinae

The DNA sequence data were much more consistent with the generic circumscription of *Leucocarbo* as defined by Voisin (1973), who included *bougainvillii* (Guanay Cormorant), *magellanicus*, *campbelli* (Campbell Shag, including *colensoi*, *ranfurlyi*), *verrucosus*, *carunculatus* (Rough-faced Shag, including *chalconotus*, *onslowi*) and the *albiventer–atriceps* complex. In keeping with the DNA-based relationships (Kennedy *et al*. 2000, 2001), *auritus* and *olivaceus* should also be included within *Leucocarbo*.

Consequently, four genera can be recognised: *Microcarbo*, *Leucocarbo*, *Phalacrocorax* and an unnamed one comprising only *gaimardi*. DNA data are not available for *harrisi* (Flightless Cormorant; Galapagos Islands), placed by Peters (1931) in monotypic *Nannopterum*. For the Australian taxa, the only taxonomic change from Christidis and Boles (1994) is that *melanoleucos* is removed from *Phalacrocorax* and put in *Microcarbo*. It is placed first in the linear classification. The DNA sequence data (Kennedy *et al*. 2000, 2001) also identified the Australian species *sulcirostris*, *varius* and *fuscescens* as a monophyletic clade, with the latter two as sister taxa. The species sequence adopted here – *melanoleucos*, *carbo*, *sulcirostris*, *varius*, *fuscescens*, *atriceps* – is consistent with the DNA data.

Van Tets (cited in Marchant and Higgins 1990: p. 911) suggested that the polymorphic New Zealand form *brevirostris* was sufficiently distinct morphologically and behaviourally to be regarded as a species distinct from *Microcarbo melanoleucos*. No published data in support of this proposal have eventuated, nor has this suggestion been taken up by subsequent authors (Orta 1992c; Christidis and Boles 1994; Holdaway *et al*. 2001) and it is not accepted here.

Phalacrocorax carbo forms a superspecies with *P. capillatus* (Japanese Cormorant; north-east Asia, Japan). Whether all populations of *carbo* form a single cosmopolitan species, as is generally accepted (e.g. Orta 1992c; Johnsgard 1993), needs to be investigated. Dorst and Mougin (1979) included the subspecies *lucidus* (eastern and southern Africa) while noting that it might possibly be distinct species, and Sibley and Monroe (1990) separated it allospecifically in this superspecies (as White-breasted Cormorant) (see also Orta 1992c). Siegel-Causey (1988) remarked that the Australasian form of the *Phalacrocrax carbo* complex, *novaehollandiae,* probably represented a separate species, but provided no details. This suggestion has not been adopted by other workers (e.g. Christidis and Boles 1994; Holdaway *et al*. 2001; Dickinson 2003). If *carbo* were found to comprise several species, that name would not apply to Australian birds. Which name was relevant would depend on where specific boundaries were drawn. A DNA-based taxonomic study of the *P. carbo* complex would be useful in clarifying these issues. Until such time, Australian birds are here included as *P. carbo*.

Within the Australian region, the genus *Leucocarbo*, as defined here, is represented by the insular forms *nivalis* (Heard Island Shag) and *purpurascens* (Macquarie Island Shag). Ship-assisted vagrants of *verrucosus* to Western Australia and Heard Island (Marchant and Higgins 1990), included on the supplementary list by Christidis and Boles (1994), are transferred to the main list here. These three forms comprise part of the *L. atriceps* complex, which also includes *atriceps* (southern South America), *bransfieldensis* (Antarctic Shag; Antarctic Peninsula), *georgianus* (South Georgia Shag; Sandwich Islands), *albiventer* (southern South America, Falkland Islands) and *melanogenis* (Crozet Shag; Crozet and Marion Islands). There is considerable disagreement about the specific status of these eight forms. Dorst and Mougin (1979) included *georgianus* and *nivalis* as subspecies of *atriceps* (*bransfieldensis* was not a separated subspecies from nominate *atriceps*), and treated the remaining four as subspecies of *albiventer*. Marchant and Higgins (1990) did not include *atriceps* or *albiventer*, but maintained the others at specific level without providing reasons. Johnsgard (1993) combined all eight forms as a single species, *P. atriceps*. Siegel-Causey (1988) examined only *georgianus, bransfieldensis, atriceps* and *verrucosus* and treated each as a species. On the basis of a previous study on patterns of courtship behaviour, Siegel-Causey (1986) included *albiventer* within *atriceps*. Moreover, Siegel-Causey (1988) kept *nivalis*, *purpurascens* and *melanogenis* as subspecies of *P. atriceps* pending further study. This arrangement was adopted by Sibley and Monroe (1990), except for regarding *albiventer* as a colour morph of nominate *atriceps*. Where these met, they interbreed, and allozyme differences between them are slight (Rasmussen 1991). Orta (1992c) recognised seven species, retaining *albiventer* as a form of *atriceps*. Dickinson (2003) accepted two species, *atriceps* (including *nivalis* and *georgianus* as subspecies and not separating *bransfieldensis* from *atriceps atriceps*) and *albiventer* (including *purpurascens* and *melanogenis*), but noted that the relationships of these birds were still unresolved.

Rasmussen (1994) analysed juvenile plumage patterns, skeletal morphometrics and allozymes in the South American *atriceps atriceps*–*atriceps albiventer* complex. Her findings supported the taxonomic assessment of Devillers and Terschuren (1978). These authors treated all continental shags of this complex – both white-cheeked *atriceps* and black-cheeked *albiventer* morphs – as *atriceps atriceps*, but kept the monomorphic black-cheeked Falkland Island population as *atriceps albiventer*. Johnsgard (1993) followed this approach. Siegel-Causey and Lefevre (1989) examined sub-fossil cormorant bones in Tierra del Fuego and suggested that, until quite recently, *bransfieldensis* was sympatric with *atriceps atriceps*, and therefore should be accorded specific status. On osteological characters, *verrucosus* was identified as the most divergent member (see Siegel-Causey 1988). DNA sequence data (Kennedy *et al.* 2000, 2001) are only available for *purpurascens* and *albiventer*. The two differed by only 0.5% sequence divergence, which is consistent with them being a single species.

Of the named taxa within *Leucocarbo* that occur in the Australian region, Christidis and Boles (1994) treated the populations on Heard (*nivalis*) and Macquarie (*purpurascens*) Islands as subspecies of *L. atriceps*, and accepted *verrucosus* as a species. Pending further study, this treatment is retained here.

A report of *Leucocarbo magellanicus* from Houtman Albrohos, Western Australia, was not accepted (BARC 380).

Microcarbo melanoleucos	Little Pied Cormorant
Phalacrocorax carbo	Great Cormorant
Phalacrocorax sulcirostris	Little Black Cormorant
Phalacrocorax varius	Pied Cormorant
Phalacrocorax fuscescens	Black-faced Cormorant
Leucocarbo atriceps	Imperial Shag^{M,H}
Leucocarbo verrucosus	Kerguelen Shag^{V}

ORDER CICONIIFORMES

Condon (1975) used the name Ardeiformes, but Ciconiiformes is generally used when the Ciconiidae are included in the order (e.g. Peters 1931; Wetmore 1960; Marchant and Higgins 1990; Sibley and Monroe 1990; del Hoyo *et al.* 1992). Inclusion of the Pelecanidae (pelicans) is explained under Higher Systematics.

Family Pelecanidae

Dorst and Mougin (1979) placed the sole Australian species, *Pelecanus conspicillatus* (Australian Pelican), in a subgenus with *P. onocrotalus* (Great White Pelican; Europe, Africa, Asia), *P. rufescens* (Pink-backed Pelican; Africa) and *P. philippensis* (Spot-billed Pelican; southern Asia through the Philippines). They included *P. crispus* (Dalmatian Pelican; Europe to Asia) in the last species, although other classifications keep it separate (e.g. Dickinson 2003).

No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Pelecanus conspicillatus	Australian Pelican

Family Ciconiidae

Peters (1931) kept the Black-necked Stork (*asiaticus*) and the Saddlebill Stork (*senegalensis*) in the monotypic genera *Xenorhynchus* and *Ephippiorhynchus*, respectively – a treatment followed by Condon (1975). Behavioural comparisons (Kahl 1972) indicated that the two species were best placed in the same genus. Kahl (1979b) included both in *Ephippiorhynchus* – an action supported by osteological data (Wood 1984) and DNA–DNA hybridisation and cytochrome-*b* sequences (Slikas 1997). Both sets of DNA data identified *Jabiru mycteria* (Jabiru; South America) as the sister lineage, but which is generically separate.

The generic names *Xenorhynchus* and *Ephippiorhynchus* were erected simultaneously (Bonaparte 1855: 106) and thus have equal priority. As first revisors, Kahl and Schüz (1972) selected *Ephippiorhynchus* as the valid name.

McAllan and Bruce (1989) treated the two subspecies of *Ephippiorhynchus asiaticus* as separate species: *E. asiaticus* (Green-necked Stork; Oriental Region) and *E. australis* (Black-necked Stork; Australia, southern New Guinea). This decision was based on the wide distributional disjunction between the two and on differences in neck colour, which the authors suggested could reflect differences in breeding displays. Christidis and Boles (1994) noted that such a move required much more substantive supporting evidence and did not accept it, nor have other subsequent authors (e.g. Marchant and Higgins 1990; Sibley and Monroe 1990; Elliott 1992). Hancock *et al.* (1992) did not regard the putative difference in the colour of iridescent neck feathers as valid, based on examination of live birds in the field and museum specimens. Nonetheless, the cytochrome-*b* sequence data of Slikas (1997) provided some support for a species split. Apart from one comparison of 0.95% involving two species of *Mycteria* (*M. leucocephala*, Painted Stork; *M. cinerea*, Milky Stork), genetic distances between congeneric stork species ranged from 3.3 % to 12.1%. The genetic distance between a confirmed individual of *E. asiaticus australis* and a presumed individual of *E. asiaticus asiaticus* (a captive individual) was 2.1%. This is much greater than other conspecific genetic distances (less than 0.91%) and of comparable to that between other stork species. The level of divergence between the two individuals argues against them being from the same population, and thus both current subspecies could be recognised at the species level. It is nonetheless highly desirable to have more precise provenance information on the specimens used in such a study. So, while acknowledging that two species could be accepted on the basis of this evidence, a conservative course is adopted by retaining a single species until a more extensive data set with better documented specimens is obtained.

Ephippiorhynchus asiaticus	Black-necked Stork

Family Ardeidae

The Ardeidae comprise the herons, egrets, bitterns, night-herons and tiger-bitterns. Bock (1956) revised the family based on a range of plumage, bill, feet, body shape, call and nesting characters. He reduced the number of genera from the more than 30 admitted by Peters (1931) to 15, with little change in the number of species. These were divided between two subfamilies: the Botaurinae, with one tribe, Botaurini (bitterns); and the Ardeinae, with three tribes – Tigriornithini (tiger-herons and Zigzag Heron), Nycticoracini (night-herons and Boat-billed Heron) and Ardeini (egrets and day herons). Payne and Risley (1976) undertook a phylogenetic analysis of 33 osteological characters and identified four groups, which were recognised as subfamilies by Payne (1979): Ardeinae, Nycticoracinae, Tigrisomatinae and Botaurinae. Kushlan and Hancock (2005) adopted a classification based on previous studies and on unpublished analyses by Sheldon and McCracken. They divided the herons into five subfamilies. Two of these were monotypic: the Agamiinae, comprising *Agamia* (*A. agami*, Agami Heron); and Cochleariinae, with *Cochlearius* (*C. cochlearius*, Boat-billed Heron). The other three subfamilies were the tiger-herons (Tigrisomatinae), bitterns (Botaurinae) and, encompassing most species, the 'typical' herons (Ardeinae). The last subfamily includes day herons, egrets and, somewhat surprisingly, night-herons. It is further divided into three tribes: Ardeini (*Ardea*, *Butorides*, *Ardeola*), Egrettini (*Egretta*, *Syrigma*, *Pilherodias*, *Nyctanassa*) and Nycticoracini (*Nycticorax*, *Gorsachius*). Dickinson (2003) followed this subfamily arrangement except for placing *Agamia* in the Tigrosomatinae. Livezey and Zusi (2007) segregated *Cochlearius* in its own family. The remaining herons were placed in two subfamilies of the Ardeidae, each with two tribes (Botaurinae: Botaurini, Tigriornithini; Ardeinae: Ardeini, Nycticoracini).

The subfamilial divisions recognised by Payne (1979), based on on Payne and Risley (1976), corresponded in their composition with the four tribes of Bock (1956), with three exceptions – the positions of the monotypic genera *Syrigma* (*S. sibilatrix*, Whistling Heron), *Pilherodius* (*P. pilherodius*, Capped Heron) and *Zebrilus* (*Z. undulatus*, Zig-zag Heron).

Payne and Risley (1976) associated *Syrigma* and *Pilherodius* with the day herons whereas Bock (1956) included them in the night-heron genus *Nycticorax*. DNA–DNA hybridisation analyses (Sheldon 1987a, b; Sheldon *et al*. 1995) and DNA sequence data (McCracken and Sheldon 2002) confirmed their inclusion with the day herons. Bock (1956) aligned *Zebrilus* with the tiger-herons, in contrast to its placement with the bitterns by Payne and Risley (1976). The latter position was corroborated by DNA–DNA hybridisation analyses of Sheldon (1987a, b) and Sheldon *et al*. (1995) and DNA sequence study of McCracken and Sheldon (2002). Bock (1956), Payne and Risley (1976) and Payne (1979) placed *Agamia* in the Ardeinae, but Martínez-Vilalta and Motis (1992) noted that morphological peculiarities suggested that this taxon may not be part of that assemblage. Their cytochrome-*b* data identified it as the sister lineage of the assemblage comprising the egrets, day herons, night-herons and bitterns. Bock (1956) and Payne and Risley (1976) advocated a close relationship between *Cochlearius* and the night-herons. This contrasts with analyses of DNA–DNA hybridisation (Sheldon 1987a, b), vocalisations (McCracken and Sheldon 1997) and cytochrome-*b* sequences (Sheldon *et al*. 2000; McCracken and Sheldon 2002), which placed *Cochlearius*, together with the tiger-herons, at the base of the heron phylogenetic tree. McCracken and Sheldon (1998) determined through character-by-character analyses that similarities between night-herons and *Cochlearius* in bill morphology and orbital structures were due to convergence. The molecular data cited are consistent with the four subfamilies recognised by Payne and Risley (1976) – Ardeinae, Nycticoracinae, Tigrisomatinae and Botaurinae – with two exceptions. *Cochlearius* is part of Tigrisomatinae, rather than the Nycticoracinae, and *Agamia* is not part of Ardeinae, although its subfamilial placement is unclear. These molecular data also found the Ardeinae and Nycticoracinae (*sensu stricto*) form a sister clade to the bitterns and Zigzag Heron. Payne and Risley (1976) did not comment on the relationships between these subfamilies, but a re-analysis of their data by McCracken and Sheldon (1998) linked the Nycticoracinae with the Botaurinae and the Ardeinae with the Tigrisomatinae.

Bock (1956) considered the bitterns to be the basal group, whereas Payne and Risley (1976) considered them to be highly derived. The generic sequence of Payne (1979) and most subsequent works (e.g. Sibley and Monroe 1990; Martínez-Vilalta and Motis 1992; Christidis and Boles 1994) reflect this. Hancock and Elliott (1978) continued to follow Bock (1956) and suggested that the tiger-herons were perhaps the sister lineage to the remaining herons – a proposal supported by DNA–DNA hybridisation (Sheldon 1987; Sheldon *et al*. 1995) and cytochrome-*b* analysis (Sheldon *et al*. 2000; McCracken and Sheldon 2002). These studies also indicated that Ardeinae and Nycticoracinae are sister clades and that Botaurinae are, in turn, a sister clade to them. Consequently, in keeping with these findings, the sequence of genera adopted here starts with the bitterns. As the night-herons and day herons are sister lineages, either can precede the other. For consistency with other current works, the day herons precede the night-herons.

Condon (1975) followed Peters (1931) in segregating the Black Bittern (*flavicollis*) in monotypic *Dupetor*, but common practice since Bock (1956) has been to merge *Dupetor* with *Ixobrychus* (e.g. Payne and Risley 1976; Payne 1979; Hancock and Elliot 1978; Marchant and Higgins 1990; Sibley and Monroe 1990; Martínez-Vilalta and Motis 1992; *contra* Dickinson 2003). This species falls within the range of size and plumage variation within that genus. Though Sibley and Monroe (1990) followed this treatment, Sibley and Monroe (1993) later reverted to recognising *Dupetor* and this was followed by Inskipp *et al.* (1996). Christidis and Boles (1994) included *flavicollis* in *Ixobrychus*. Zhang *et al.* (2004), using cytochrome-*b* gene sequences, confirmed that this species belongs in *Ixobrychus*. This classification was used by Hancock and Kushlan (2005) and is maintained here.

Bock (1956), Payne and Risley (1976), Payne (1979), Martínez-Vilalta and Motis (1992) and Kushlan and Hancock (2005) recognised a single species in the *Ixobrychus minutus* (Little Bittern; Old World) complex. Based on disjunct distributions and morphological differences, Voous (1960) suggested that the Australian and New Zealand forms of this complex probably represented a species separate from the European and African forms. Such an action was taken by Sibley and Monroe (1990), who segregated the Australian and New Zealand populations as *I. novaezelandiae* (Black-backed Bittern). In contrast, both Turbott (1990) and Marchant and Higgins (1990) retained the Australian form in *I. minutus*, but separated the New Zealand form as *I. novaezelandiae* (New Zealand Bittern). This action was used by Christidis and Boles (1994), Holdaway *et al.* (2001) and Dickinson (2003). Christidis and Boles (1994) noted that research might also reveal that the Australian population of *I. minutus* is a distinct species from the African and Palaearctic forms. Cytochrome-*b* sequence data (McCracken and Sheldon 2002) demonstrated that the Australian form of *I. minutus* is more closely related to *I. sinensis* (Yellow Bittern) than it is to the African-Palaearctic form of *I. minutus*. No DNA data are available for the extinct New Zealand form. Currently, three taxa are recognised in the complex: *I. minutus* (Little Bittern; Africa, Palaearctic), *I. dubius* (Australian Little Bittern) and *I. novaezelandiae* (New Zealand Bittern). Further DNA data might indicate that the last two comprise a single species or that some of these taxa may be more closely related to other members of the genus.

Ixobrychus sinensis (Yellow Bittern) has been recorded as a vagrant from both mainland Australia and Christmas Island (detailed in Marchant and Higgins 1990; see also Stokes 1990). Since Christidis and Boles (1994), specimen records of *I. cinnamomeus* (Cinnamon Bittern) (Carter 2003; BARC 332) and *I. eurhythmus* (Schrenk's Bittern) from Christmas Island (Barrand *et al.* 2006; BARC 419) have been accepted.

The four large bitterns (*Botaurus*) form two species pairs – the two New World forms and the two Old World ones. Whether the latter birds are better regarded as conspecific has not been satisfactorily answered. Without presenting evidence, van Tets (1977) commented that *Botaurus poiciloptilus* (Australasian Bittern) could be regarded as a subspecies of *B. stellaris* (Eurasian Bittern). McKean (1979), however, argued for their continued separation, citing consistent plumage differences. This latter practice has been maintained by most authors (e.g. Bock 1956; Hancock and Elliott 1978; Payne 1979; Marchant and Higgins 1990; Sibley and Monroe 1990; Martínez-Vilalta and Motis 1992; Christidis and Boles 1994; Dickinson 2003; Kushlan and Hancock 2005). Cytochrome-*b* sequence data (McCracken and Sheldon 2002), however, suggest that the two might be treated as a single species. Pending further molecular work addressing this issue, Australasian birds are retained here as *B. poiciloptilus*.

As noted by Christidis and Boles (1994), the composition of the genera *Egretta*, *Ardea*, *Ardeola*, *Bubulcus* and *Butorides* has differed greatly between treatments. Van Tets (1977) suggested that all should be combined into *Ardea* and Mock (1977) made a similar recommendation for the first four genera at least. These suggestions were accepted by Marchant and Higgins (1990), but not by Hancock and Elliott (1978), Sibley and Monroe (1990), Martínez-Vilalta and Motis (1992) and Christidis and Boles (1994). Kushlan and Hancock (2005) merged *Bubulcus* with *Ardea*, but retained the others at generic level. A summary of the various taxonomic treatments for the Australian taxa in this assemblage follows below.

The White-necked Heron (*pacifica*) and the Great-billed Heron (*sumatrana*) have been almost universally included in *Ardea*. Marchant and Higgins (1990) placed the Little Egret (*garzetta*) and the Eastern Reef Heron (*sacra*) in *Ardea,* but the majority of other treatments have included them in *Egretta*. Most other Australian day herons have at various times been placed in at least two, and sometimes up to four, genera, as indicated by the following summaries.

- Great Egret (*alba*): monotypic *Casmerodius* (Peters 1931; AOU 1983; Sibley and Monroe 1990; Inskipp *et al.* 1996; Sangster *et al.* 1999); *Egretta* (Bock 1956; Condon 1975; Turbott 1990; Martínez-Vilalta and Motis 1992); and *Ardea* (Payne and Risley 1976; Payne 1979; Marchant and Higgins 1990; Christidis and Boles 1994; AOU 1998; Dickinson 2003; Kushlan and Hancock 2005).
- White-faced Heron (*novaehollandiae*): *Notophoyx* (Peters 1931); *Egretta* (Payne and Risley 1976; Payne 1979; Sibley and Monroe 1990; Martínez-Vilalta and Motis 1992; Christidis and Boles 1994; Kushlan and Hancock 2005); and *Ardea* (Bock 1956; Condon 1975; Marchant and Higgins 1990; Turbott 1990).
- Pied Heron (*picata*): *Notophoyx* (Peters 1931); *Egretta* (Payne and Risley 1976; Payne 1979; Martínez-Vilalta and Motis 1992; Kushlan and Hancock 2005); *Ardea* (Condon 1975; Marchant and Higgins 1990; Sibley and Monroe 1990; Christidis and Boles 1994; Dickinson 2003); and *Hydranassa* (Bock 1956).
- Intermediate Egret (*intermedia*): monotypic *Mesophoyx* (Peters 1931; Sibley and Monroe 1990; Inskipp *et al.* 1996); *Egretta* (Bock 1956; Condon 1975; Payne and Risley 1976; Payne 1979; Turbott 1990; Martínez-Vilalta and Motis 1992; Dickinson 2003); and *Ardea* (Marchant and Higgins 1990; Christidis and Boles 1994; Kushlan and Hancock 2005).
- Cattle Egret (*ibis*): monotypic *Bubulcus* (Peters 1931; Hancock and Elliott 1978; Sibley and Monroe 1990; Turbott 1990; Martínez-Vilalta and Motis 1992; Inskipp *et al.* 1996; Dickinson 2003); *Ardeola* (Bock 1956; Condon 1975), *Egretta* (Payne and Risley 1976; Payne 1979); and *Ardea* (Higgins and Marchant 1990; Christidis and Boles 1994; Kushlan and Hancock 2005).
- Striated Heron (*striata*): generally monotypic *Butorides* (Peters 1931; Bock 1956; Condon 1975; Hancock and Elliott 1978; Sibley and Monroe 1990; Martínez-Vilalta and Motis 1992; Christidis and Boles 1994; Dickinson 2003; Kushlan and Hancock 2005); but *Ardeola* (Payne and Risley 1976; Payne 1979); and *Ardea* (Marchant and Higgins1990, following Van Tets 1977). Note that David and Gosselin (2002b) determined that the gender of *Butorides* was feminine; the specific epithet is thus *striata*, not *striatus* as used by Christidis and Boles (1994).

Using DNA–DNA hybridisation, Sheldon (1987) examined relationships among 14 species within the *Egretta–Ardea–Ardeola–Bubulcus-Butorides* assemblage. Three clades could be recognised:

(1) *Egretta*: *garzetta*, *thula* (Snowy Egret), *vinaceigula* (Slaty Egret), *sacra*, *novaehollandiae*, *tricolor* (Tricolored Heron), *caerulea* (Little Blue Heron)
(2) *Ardea*: *herodias* (Great Blue Heron), *cocoi* (Cocoi Heron), *sumatrana*, *melanocephala*

(Black-headed Heron), *alba*, *intermedia*, *ibis*

(3) *Butorides striata*.

Syrigma sibilatrix was linked to the *Egretta* clade. According to Sheldon (1987), *ibis*, *alba* and *intermedia* were as close to *Ardea herodias* as were any of the typical members of *Ardea* and could therefore be included in that genus. This recommendation was adopted by Christidis and Boles (1994).

Cytochrome-*b* sequence data (Sheldon *et al*. 2000; McCracken and Sheldon 2002) confirmed and extended the DNA–DNA hybridisation results. The Australian taxa *ibis*, *alba*, *intermedia*, *pacifica* and *sumatrana* were clearly identified as part of *Ardea*, while *picata* was embedded within *Egretta* along with *sacra*, *garzetta* and *novaehollandiae*. *Butorides*, while linked to *Ardeola*, was divergent enough to warrant separate generic status. In order to reflect the DNA sequence data, the only change required from the treatment in Christidis and Boles (1994) is the transfer of *picata* from *Ardea* to *Egretta*. This change is accepted here.

Sheldon (1987) found that in DNA–DNA hybridisation distances, *Ardea alba modesta* (southern Asia, Australasia) was as distinct from *Ardea alba egretta* (New World), as was *Ardea intermedia*. This relatively large genetic distance was consistent with Hancock's (1984) suggestion, based on the presence of an aerial stretch display in *A. a. modesta*, but not in *A. a. egretta*, that these two populations may represent different species. Cytochrome-*b* sequence data (McCracken and Sheldon 2002) has also identified genetic divergences between the two forms that are more consistent with species level treatment. Kushland and Hancock (2005) treated *A. modesta* and *A. alba* (including *egretta*) as separate species. Unfortunately, no genetic data have been reported for the forms *alba* (Europe, central Asia) and *melanorhynchos* (Africa).

Good evidence indicates that *A. alba* as conventionally treated consists of several species, with those of New World and south Asia–Australasia being distinct from each other. On the basis of behavioural data, birds of Eurasia–Africa appear more closely related to those of the New World. Until this is tested, the treatment by Kushland and Hancock (2005) is followed, maintaining *A. alba* (Great Egret) for New World-Eurasian–African birds and *A. modesta* (Eastern Great Egret) for those of south Asia–Australasia.

One of the more contentious taxonomic issues in this family is how many species should be recognised in the *Egretta garzetta* complex. Some authors (e.g. Bock 1956; Payne 1979; Sibley and Monroe 1990; Dickinson 2003) treated *Egretta garzetta*, including *nigripes* (Little Egret), *E. gularis*, including *schistacea* (Western Reef Egret), and *dimorpha* (Dimorphic Egret) as three separate species. Hancock and Elliott (1978) recognised two species, merging *dimorpha* with *gularis*, and Hancock and Kushlan (1984) and Martínez-Vilalta and Motis (1992) regarded all these forms as a single species. McCracken and Sheldon (2002) found no difference between nominate *garzetta* and *schistaceus* using cytochrome-*b* sequence data. Kushlan and Hancock (2005) noted the problem of variability, reported hybridisation and lack of adequate morphological and molecular data. They kept all forms as a single, highly polytypic species. This is tentatively accepted here, while emphasising the need for further work on the species limits within the *E. garzetta* group and related forms such as. *E. thula* (Snowy Egret). Most Australian birds are subspecies *nigripes* (includes *immaculata*). The nominate form *garzetta* has also been recorded (Carter 1994a; Johnstone and Darnell 2004a; Carter and Menkhorst 2006) and there have been possible observations of *gularis schistaceus* on the Cocos (Keeling) Islands (Johnstone and Darnell 2004b; Dooley 2007b).

On the basis of differences in breeding plumages, Payne and Risley (1976) suggested that *Ardea ibis ibis* (Africa, Europe, New World) and *A. i. coromanda* (southern Asia, Australasia) could best be regarded as a distinct species. White and Bruce (1986) and Christidis and Boles (1994) suggested further work on the issue was required, whereas McAllan and Bruce (1989) treated the two as separate species. Cytochrome-*b* sequence distances (McCracken and Sheldon 2002) are more consistent with current treatment as subspecies, and this is maintained here.

Condon (1975) tentatively included *Ardea cinerea* (Grey Heron) as a straggler to Australia, but this record was not accepted (see Marchant and Higgins 1990); however, a subsequent report from Western Australia has been accepted (Lane 2002; BARC 368); see Johnstone and Storr (1998) for some unreviewed reports. This species has been moved from the supplementary list (Christidis and Boles 1994) to the main Australian list here. *Ardeola bacchus* (Chinese Pond Heron) was accepted from Cocos (Keeling) Islands (Dooley 2006c; BARC 488). An individual *A. speciosa* (Javan Pond Heron) at Darwin was seen and photographed by numerous observers (Dooley 2007b). There have been several observations of pond herons (*Ardeola*) from Christmas Island that could not be identified to species (BARC 452; Johnstone and Darnell 2005a). A purported specimen of *Egretta eulophotes* (Chinese Egret) from Christmas Island was identified as a white morph of *E. sacra* (see Marchant and Higgins 1990). Christidis and Boles (1994) placed *E. eulophotes* on the supplementary list, but it is omitted here. There is an unconfirmed report of *Ardea purpurea* from Christmas Island (Johnstone and Darnell 2004a); this species is placed on the supplementary list.

Bock (1956) treated *Butorides striata*, *B. virescens* (Green Heron) and *B. sundevalli* (Galapagos Heron) as three species, whereas Payne (1974) combined all three under *B. striata*. The latter action was followed by Payne and Risley (1976), Payne (1979), AOU (1983) and Martínez-Vilalta and Motis (1992), but not by Sibley and Monroe (1990) nor Dickinson (2003), who retained three species. One of the pieces of evidence cited by Payne (1974) for combining *striata* and *virescens* was apparent hybridisation between them in the Caribbean and northern South America. Monroe and Browning (1992) reviewed the data for purported hybridisation and considered that this was an infrequent occurrence. They concluded that the two forms should be maintained as separate species; this was followed by AOU (1993, 1998). Hayes (2002) found populations in southern Caribbean islands and southern Central America with intermediate plumages, which is indicative of extensive hybridisation; however, parental types of both *striata* and *virescens* also occurred there and appeared to exhibit some assortive mating and ecological exclusion. Kushlan and Hancock (2005) cited a personal communication from K. McCracken that molecular evidence tended to support species status for *striata* and *virescens*. This issue continues to be debated (see discussion in Kushlan and Hancock 2005) and conclusive evidence has yet to be published. Acceptance of two species seems to be the best action based on available evidence, although this does not affect the nomenclature of Australian birds.

Bock (1956) recognised two genera of night-heron: (1) *Gorsachius*, with *goisagi* (Japanese Night-Heron), *melanolophus* (Malayan Night-Heron), *magnificus* (White-eared Night-Heron) and *leuconotus* (White-backed Night-Heron); and (2) *Nycticorax*, with *nycticorax* (Black-crowned Night-Heron), *caledonicus* (Nankeen Night-Heron), *pileatus*, *sibilator* and *violaceus* (Yellow-crowned Night-Heron). Payne and Risley (1976) and Payne (1979) removed *pileatus*, *sibilator* and *violaceus* from *Nycticorax* (placing the last in monotypic *Nyctanassa*) while combining *Gorsachius* with *Nycticorax*. Hancock and Elliott (1978) followed Bock (1956) except for also recognising *Syrigma* and *Pilherodius* (see discussion above). The DNA–DNA hybridisation data of Sheldon (1987) supported the segregation of *violaceus* into *Nyctanassa*; this was adopted by Sibley and Monroe, but not by Martínez-Vilalta and Motis (1992). Kushlan and Hancock (2005) included *Nyctanassa* with the Egrettini rather than Nycticoracini, commenting that this genus was no more closely related to the night-herons than to other ‘typical’ herons. Most works have recognised *Gorsachius* as separate from *Nycticorax* (King *et al*. 1975; White and Bruce 1986; Sibley and Monroe 1990; Martínez-Vilalta and Motis 1992; Christidis and Boles 1994; Inskipp *et al*. 1996; Dickinson 2003), although Marchant and Higgins (1990) and Johnstone and Storr (1998) used *Nycticorax* rather than *Gorsachius* for *melanolophus*,

Martínez-Vilalta and Motis (1992) placed *leuconotus* in *Nycticorax*, but provided no details. The cytochrome-*b* sequence data of Sheldon *et al*. (2000) and McCracken and Sheldon (2002) supported recognition of the three genera – *Nycticorax*, *Nyctanassa* and *Gorsachius* – although it should be noted that the only representative examined from the last genus was *leuconotus*. Recognition of both *Nycticorax* and *Gorsachius* is adopted here.

Apart from the resident species *Nycticorax caledonicus*, two other night-herons have been recorded from the Australian region. *Nycticorax nycticorax* has been recorded on Cocos (Keeling) Islands (Gibson-Hill 1949) and Ashmore Reef (BARC 180). *Gorsachius melanolophus* has been recorded from Christmas Island (Stokes *et al*. 1987; Johnstone and Darnell 2004a; BARC 345).

Botaurus poiciloptilus	Australasian Bittern
Ixobrychus dubius	Australian Little Bittern
Ixobrychus sinensis	Yellow Bittern^{V}
Ixobrychus eurhythmus	Schrenk's Bittern$^{C/V}$
Ixobrychus cinnamomeus	Cinnamon Bittern$^{C/V}$
Ixobrychus flavicollis	Black Bittern
Ardea cinerea	Grey Heron^{V}
Ardea pacifica	White-necked Heron
Ardea modesta	Eastern Great Egret
Ardea intermedia	Intermediate Egret
Ardea sumatrana	Great-billed Heron
Ardea purpurea	Purple Heron$^{S(C)}$
Ardea ibis	Cattle Egret
Butorides striata	Striated Heron
Ardeola bacchus	Chinese Pond Heron$^{C/V}$
Ardeola speciosa	Javan Pond Heron^{V}
Egretta picata	Pied Heron
Egretta novaehollandiae	White-faced Heron
Egretta garzetta	Little Egret
Egretta gularis	Western Reef Egret$^{S(CK)}$
Egretta sacra	Eastern Reef Egret
Nycticorax nycticorax	Black-crowned Night-Heron$^{CK/V,A/V}$
Nycticorax caledonicus	Nankeen Night-Heron
Gorsachius melanolophus	Malayan Night-Heron$^{C/V}$

Family Threskiornithidae

The name Threskiornithidae Poche, 1904, was ruled to be the valid name for the family of ibises and spoonbills (ICZN 1992). The name Plataleinae Bonaparte, 1838, was retained as being available for the subfamily of spoonbills. Livezey and Zusi (2007) treated these as separate families.

The widespread *Plegadis falcinellus* (Glossy Ibis) was long considered to also include New World *P. chichi* (White-faced Ibis) (e.g. Parkes 1955; Palmer 1962). However, the two forms apparently occur sympatrically in the southern United States without interbreeding (Duncan and Johnson 1977) and are now generally treated as distinct species (e.g. AOU 1983, 1998; Steinbacher 1979; Sibley and Monroe 1990; Hancock *et al*. 1992; Matheu and del Hoyo 1992; Dickinson 2003).

Peters (1931) recognised *Threskiornis aethiopicus* (Sacred Ibis; African region), *T. melanocephalus* (Black-headed Ibis; southern Asian region) and *T. molucca* (Australian White Ibis; Australian region) as separate species. Holyoak (1970a) compared adult and juvenile plumage patterns within the complex and reported that *aethiopicus* and *molucca* resembled each other most closely in adult plumages, whereas in juvenile plumages *molucca* and *melanocephalus* were more similar. He argued that the three were best treated as a single species, *T. aethiopicus* – an action followed by RAOU (1978b), Steinbacher (1979), Beehler and Finch (1985), but not by Condon (1975), White and Bruce (1986), Marchant and Higgins (1990) and Sibley and Monroe (1990). Lowe and Richards (1991) reassessed plumage and morphological characters in the complex and concluded that recognition of three species was warranted. Moreover, each of the three forms possesses a different karyotype (summarised in de Boer and van Brink 1982). Accordingly, most subsequent authors (Hancock *et al.* 1992; Matheu and del Hoyo 1992; Christidis and Boles 1994; Inskipp *et al.* 1996; Dickinson 2003) have retained the three forms as separate species, and this is also done so here.

Mees (1982a) pointed out that *Threskiornis* was masculine (see also ICZN 1985: Article 30a) and that the specific name *molucca* should be changed to *moluccus*. McAllan and Bruce (1989), citing a personal communication from S.A. Parker, noted that in the original description *molucca* was used in noun form and should not be changed; see also Sibley and Monroe (1990: p. 313). This assessment was accepted by Dickinson (2003) and is followed here.

Steinbacher (1979) regarded *Platalea regia* (Royal Spoonbill; Australasia) as a subspecies of Palaearctic *P. leucorodia* (Eurasian Spoonbill). The more widespread treatment has been to retain these as separate species (e.g. Condon 1975; Beehler and Finch 1985; White and Bruce 1986; Sibley and Monroe 1990; Hancock *et al.* 1992; Matheu and del Hoyo 1992; Christidis and Boles 1994; Inskipp *et al.* 1996; Dickinson 2003). Hancock *et al.* (1992) suggested that *P. regia* was more closely related to Asian *P. minor* (Black-faced Spoonbill), although the two should still be retained as separate species. Here recognition of *P. regia* as a species is maintained.

No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Plegadis falcinellus	Glossy Ibis
Threskiornis molucca	Australian White Ibis
Threskiornis spinicollis	Straw-necked Ibis
Platalea regia	Royal Spoonbill
Platalea flavipes	Yellow-billed Spoonbill

ORDER ACCIPITRIFORMES

The Osprey (*Pandion haliaetus*) was long segregated into a monotypic family (e.g. Brown and Amadon 1968; Condon 1975; del Hoyo 1994; Ferguson-Lees *et al.* 2001), but has increasing been included at subfamily rank in the Accipitridae (e.g. Stresemann and Amadon 1979; Sibley and Monroe 1990; AOU 1998; Dickinson 2003) – usually as the member nearest to the base of the family tree.

The results of Wink and Sauer-Gürth (2004) from cytochrome-*b* DNA sequences indicated that the elaniine kites, such as *Elanus*, occupied a more basal position than ospreys and plausibly warrant separation at family level (Elanidae). Although this has not been adopted at this time, it warrants further consideration as more information is accrued. Wink and Sauer-Gürth (2004) also regarded *Pandion* as sufficiently distinct to be maintained in a monogeneric family. Lerner and Mindell (2005), using both mitochondrial and nuclear DNA sequences, recovered a more traditional position for *Pandion*, as sister taxon to the Accipitridae (*sensu stricto*, including *Elanus*). *Elanus* was the sister genus to the remaining Accipitridae. Given the contradictory conclusions from different studies, no changes to the treatment of Christidis and Boles (1994) are made at this time. One Australian family – Accipitridae (including *Elanus* and *Pandion*) – is recognised.

Family Accipitridae

The sequence here has been altered from Christidis and Boles (1994) to reflect the recommendations of recent studies, although where these studies disagree a more traditional treatment has been adopted.

Mindell *et al.* (1997) identified *Pandion* as the sister taxon to *Pernis* (represented by *P. apivorus*, European Honey-Buzzard). These two genera comprised the sister lineage to the other Accipitridae examined. Wink *et al.* (1996) did not examine *Pandion*, but they did recover *Pernis* as the basally diverging lineage relative to other accipitrid genera. Wink and Sauer-Gürth (2004) did not find a sister group relationship between *Pandion* and *Pernis*. Lerner and Mindell (2005) recovered *Pandion* as the sister taxon to the remaining accipitrines (Accipitridae *sensu stricto*).

Thiollay (1994) proposed that an assemblage of Australasian endemic genera might comprise the remnants of an older clade of accipitrids. In this group, he included monotypic *Hamirostra* (*H. melanosternon*, Black-breasted Buzzard) and *Lophoictinia* (*L. isura*, Square-tailed Kite) of Australia, *Henicopernis* (long-tailed buzzards) and *Megatriorchis* (*M. doriae*, Doria's Goshawk) of New Guinea, *Erythrotriorchis* (Red and Chestnut-shouldered Goshawks) with Australian and New Guinean representatives, and possibly *Harpyopsis* (*H. novaeguineae*, New Guinea Harpy Eagle).

This suggested arrangement has not been scrutinised closely because few of these taxa have been included in any molecular studies. Two that have are *Hamirostra* and *Lophoictinia*, which were found by Wink and Sauer-Gürth (2004) to be sister taxa in a position basal to most more widely spread genera. Lerner and Mindell (2005) also found this sister relationship although, in their analysis, these genera were within the pernine kites, in a larger clade that also included *Polyboroides* (gymnogenes) and gypaetine vultures – this assemblage had a sister relationship to the remaining accipitrids. Johnstone and Storr (1998) merged *Hamirostra* and *Lophoictinia*.

Wink *et al.* (1996) examined the phylogeny and systematics of sea-eagles (*Haliaeetus*) using DNA sequences from the mitochondrial cytochrome-*b* gene. Of the genera examined, the nearest relatives of *Haliaeetus* were *Milvus* (kites) and *Buteo* (buzzards). This assemblage was in turn linked to *Circus* (harriers) and *Accipiter* (goshawks). Mindell *et al.* (1997) examined the relationships among a small number of accipitrid genera using the mitochondrial 12S ribosomal gene and obtained a sister relationship between *Haliaeetus* and *Milvus*, which, in turn, were linked to *Buteo*, *Circus* and *Accipiter*. Although both DNA studies (Wink *et al.*1996; Mindell *et al.* 1997) identified a close relationship between the five genera, there was less concordance on the sequence of relationships. Lerner and Mindell (2005) confirmed the relationship among the milvine kites and sea-eagles. They also found that *Haliaeetus* was not monophyletic relative to species of *Ichthyophaga* (fishing eagles). In a study with greater taxonomic coverage, the other genus of milvine kite – *Haliastur* – is the sister taxon to *Milvus*; the genetic distance indicates that these two should be retained as separate genera (Wink and Sauer-Gürth 2004; see also Baker-Gabb 1989).

Christidis and Boles (1994) treated *Erythrotriorchis* as a monotypic genus containing only *E. radiatus* (Red Goshawk). The current consensus, however, is to also include *E. buergersi* (Chestnut-shouldered Goshawk, New Guinea) in the genus (e.g. Sibley and Monroe 1990; Debus 1991, 1994a; Debus *et al.* 1994; Ferguson-Lees *et al.* 2001). Although Ferguson-Lees *et al.* (2001) use hawk instead of goshawk for the vernacular names of members of *Erythrotriorchis* to emphasise their separation from typical *Accipter* goshawks, this practice is not followed here. Christidis and Boles (1994) discussed the pitfalls and limitations of linking taxonomic changes and vernacular names.

Accipiter and *Circus* are consistently found to be sister genera (e.g. Wink and Sauer-Gürth 2004; Lerner and Mindell 2005), although no published study to date has included *Erythrotriorchis*, *Megatriorchis* or other supposed close relatives of *Accipiter*.

The aquiline eagles (represented in Australia by *Aquila* and *Hieraaetus*) form a natural group. However, both Wink and Sauer-Gürth (2004) and Lerner and Mindell (2005) found that currently used generic limits require rationalisation. These studies had slightly different taxon representations, but several findings were in agreement. Two larger (non-Australian) species of *Hieraaetus* (*fasciatus*, *spilogaster*) are embedded within *Aquila* (excluding *wahlbergi*, *clanga* and *pomarina*). The remaining species of *Hieraaetus*, including Australian *morphnoides*, plus *A. wahlbergi*, form a clade that is a sister taxon to this group (also see Smeenk 1974). A third group comprising *A. clanga* and *pomarina* and *Lophoaetus occipitalis* has a sister relationship to this clade,. Because both *Aquila* and *Hieraaetus* are polyphyletic, changes in their delimitations are required.

These genera could be combined, as advocated by Storr (1984) and Johnstone and Storr (1998). Alternatively, *Aquila* could be restricted to the first group mentioned above and *Hieraaetus* to the second, with the third group combined taking a different generic name. The second approach is adopted here, with no consequent changes to the generic names applicable to Australian species.

Pandion haliaetus, as currently recognised, has a cosmopolitan distribution (Poole 1994). Genetic distances (based on almost complete nucleotide sequences of cytochrome-*b*) between subspecies of Osprey (1.9–3.8%) are equivalent to, or greater than, those seen between members of several closely related sister species within *Aquila* and *Hieraeetus* (Wink *et al*. 2004a). This, combined with small, but consistent, differences in plumage and morphology, led Wink *et al*. (2004a) and Wink and Sauer-Gürth (2004) to suggest that three species of *Pandion* could be recognised. Acceptance of this recommendation means that Australian birds become *Pandion cristatus* (Eastern Osprey).

Elanus axillaris (Black-shouldered Kite) has sometimes been considered conspecific with New World *E. leucurus* (e.g. Palmer 1988). Clark and Banks (1992) demonstrated that these forms have sufficient differences in plumage, size and proportions, and behaviour for each to warrant recognition at the species level. *Elanus axillaris* is more similar to widespread Old World *E. caeruleus* and has sometimes been considered conspecific with it. Johnstone and Storr (1998) treated Australian birds as *caeruleus*, but most recent authors (e.g. Mees 1982b; Ferguson-Lees *et al*. 2001; Dickinson 2003) have retained them as separate species. Mees (1982b) discussed differences among this group of species. Although *E. axillaris* is here maintained as distinct species, this issue warrants more study. Records from southern New Guinea have been treated as *E. caeruleus* (*sensu stricto*) by the preceding authors.

Pernis ptilorynchus (Oriental Honey-buzzard) – known from Australia as a vagrant – is sometimes included in *P. apivorous* (European Honey-buzzard), but these are best regarded as members of a superspecies (Orta 1994d). Note the original spelling of *ptilorynchus*, emendations to which are not considered justified (Orta 1994d).

Several subspecies of *Milvus migrans* (Black Kite) are sometimes accorded separate species status. Orta (1994d) considered that intergradation between these forms suggests that they are best maintained as a single species. Scheider *et al.*(2004) used DNA sequences of cytochrome-*b* to investigate relationships between and within species of the genus *Milvus*. Unexpectedly, the Australian subspecies, *M. m. affinis*, came out at the base of the tree, and had a sister relationship to the rest of this species plus *M. milvus* (Red Kite). The authors suggested this strange finding may have resulted from degraded DNA obtained from the single individual examined. Additional data are required before any shift is made of Australian birds from within the widespread *M. migrans*.

Within *Haliaeetus*, Wink *et al*. (1996) recorded only 0.3% divergence between *H. leucogaster* (White-bellied Sea-Eagle) and *H. sanfordi* (Sanford's Sea-Eagle). Lerner and Mindell (2005) also found a very close relationship between these forms, but did quantify the level of divergence. The latter is restricted to the Solomon Islands and it has been suggested that it may represent a paedomorphic variant of the more widespread *H. leucogaster* (south-east Asia and Australasia), with adults retaining immature plumage (see Ferguson-Lees 2001). Although Wink *et al*. (1996) retained the two as separate species, this is questionable given that there is 2.5% sequence divergence between the allospecies *H. albicilla* (White-tailed Sea-Eagle) and *H. leucocephalus* (Bald Eagle) and over 8.5% between other members of the genus. Accordingly, *H. sanfordi* should be regarded as a subspecies of *H. leucogaster.*

Several authors (White and Bruce 1986; Christidis and Boles 1994; Inskipp *et al*. 1996) have remarked that the number of species to be recognised within the *Accipiter novaehollandiae–hiogaster–griseogularis* complex is still to be resolved. Current convention is to recognise only one species (White and Bruce 1986; Sibley and Monroe 1990; Andrew 1992; Christidis and Boles 1994; Debus 1994a; Inskipp *et al.* 1996; Dickinson 2003). Ferguson-Lees *et al.* (2001) briefly reviewed the complex and recognised three species: (1) *A. novaehollandiae* (Grey Goshawk, Australia); (2) *A. hiogaster* (Variable Goshawk, New Guinea, Solomons and Lesser Sundas) and (3) *A. griseogularis* (Grey-throated Goshawk, Moluccas). The case for at least recognising *A. hiogaster* (including *A. griseogularis*) and *A. novaehollandiae* as separate species is based in part on the latter's large size and lack of rufous in the plumage. Also judged significant by Schodde (1977) and Ferguson-Lees *et al.* (2001) was the abrupt plumage change between Australia and New Guinea with no evidence of intergradation, despite the periodic connection between these landmasses during the Quaternary. The segregation of *A. hiogaster* from *A. novaehollandiae* is followed here. DNA sequence data will be useful in assessing the validity of this treatment and whether or not further forms such as *A. griseogularis* need also be recognised.

Accipiter fasciatus (Brown Goshawk) ranges from Wallacea, New Guinea, Australia and through to the South Pacific (New Caledonia, Loyalty, Vanuatu). Debus (1994a) used the name Australasian Goshawk. The nominate form is the largest and occurs in southern Australia (it is thought to be a winter migrant to northern Australia) and the Solomons. A smaller form, *didimus*, occurs in northern Australia. Ford (1986a) suggested that the nominate form may also be resident in northern Australia and that consequently it and *didimus* could represent separate species. Sibley and Monroe (1990) suggested that if this were the case, then the other small races occurring in the Moluccas, Lesser Sundas, New Guinea and the South Pacific would be conspecific with *didimus*. As a result, the name *wallacei* Sharpe, 1874 would have priority over *didimus* Mathews, 1912. Since Ford (1986a) did not consider forms outside of Australia, the conclusion by Sibley and Monroe (1990) was premature. Moreover, according to Ferguson-Lees *et al.* (2001), the form *vigilax* from the South Pacific is more similar in plumage to *fasciatus* than to *didimus*. The current consensus is to only recognise one species (e.g. Sibley and Monroe 1990; Christidis and Boles 1994; Debus 1994a; Ferguson-Lees *et al.* 2001), and this is maintained here.

Another question worth examining is whether the form occurring in Rennell and Bellona Islands (Solomon Islands), as currently treated by Stresemann and Amadon (1979), is in fact the same subspecies as that in southern Australia.

The taxonomic affinities of the *A. natalis* (Christmas Island Goshawk, Christmas Island) require clarification. Most current treatments treat it as a subspecies of *Accipiter fasciatus* (e.g. Stresemann and Amadon 1979; White and Bruce 1986; Sibley and Monroe 1990; Debus 1994a; Christidis and Boles 1994; Inskipp *et al.* 1996; Dickinson 2003), following Chasen (1933), although Lister (1888) had thought it was more closely related to *A. hiogaster griseogularis*. Carter (1994a) also suggested that, based on appearance, *natalis* was probably closer to the *Accipiter novaehollandiae–hiogaster–griseogularis* complex than to *A. fasciatus*. In reviewing the available data and literature, Debus (1994b) concluded that Lister (1888) was probably correct in aligning *natalis* with *griseogularis*. Ferguson-Lees *et al.* (2001) treated *natalis* as a subspecies of *A. hiogaster*, but also canvassed the possibility that it may be a form of *A. griseogularis* or a distinct species in its own right. Here *natalis* is transferred from *A. fasciatus* to *A. hiogaster* (including *griseogularis*), although it possible that further study, including DNA data, may reveal it to be a distinct species.

Australasian species *fasciatus* and *cirrocephalus* formed a clade separate from four Northern Hemisphere species (*gentilis*, *cooperii*, *striatus* and *nisus*) (Wink and Sauer-Grüth 2004). Marchant and Higgins (1993), Christidis and Boles (1994) and Ferguson-Lees *et al.* (2001) all used *Accipiter cirrhoceph-*

alus for the Collared Sparrowhawk; however, the original spelling was *cirrocephalus* and should be used (e.g. Sibley and Monroe 1990; Debus 1994a).

White and Bruce (1986), Sibley and Monroe (1990), Andrew (1992), Christidis and Boles (1994), Debus (1994a) and Dickinson (2003) treated *Circus spilonotus* (Eastern Marsh Harrier), *C. aeruginosus* (Western Marsh Harrier) and *C. approximans* (Swamp Harrier) as separate species. Inskipp *et al*. (1996) and Ferguson-Lees *et al*. (2001) combined *spilonotus* and *aeruginosus* as a single species, *A. aeruginosus* (Northen Marsh Harrier), because of reported interbreeding between the two (e.g. Fefelov 2001). For the present, all three forms are regarded as separate species, albeit tentatively. *Circus approximans spilothorax* from New Guinea is sometimes considered to be more closely allied with *C. spilonotus*, but this is unlikely (Ferguson-Lees *et al*. 2001). Debus (1994a) used the name Pacific Marsh Harrier for *C. approximans*.

Simmons (2000) reported cytochrome-*b* comparisons among the species of harriers. These formed three main clades. *Circus buffoni* (Long-winged Harrier, South America) was the sister species to the other species. These fell into two clusters, roughly characterised as marsh harriers and steppe harriers. In the former, two island species, *macrosceles* (Madagascar Harrier) and *maillardi* (Reunion Harrier), grouped together and then with *aeruginosus*. Collectively, these were the sister clade to *approximans*. Also in this cluster was the pair *spilonotus* and *ranivorus* (African Marsh Harrier). The other Australian species, *C. assimilis* (Spotted Harrier), is in the second clade with the 'steppe' species.

Lerner and Mindell (2005) compared the two subspecies of *Hieraaetus morphnoides* (Little Eagle), nominate *H. m. morphnoides* (Australia) and the smaller, darker *H. m. weiski* (New Guinea). The amount of genetic divergence between these forms was comparable to that between species in other genera. The authors recommended that these be treated as separate species. This was confirmed by Bunce *et al.*(2005), who found that *H. m. morphnoides* was closer to *H. pennatus* (Booted Eagle) than to *H. m. weiski*. They also recovered a close relationship between *morphnoides–pennatus* and the now extinct, giant *Harpagornis moorei* (Haast's Eagle) of New Zealand. The last species was interpreted to be derived from *morphnoides–pennatus*, which would have involved a roughly ten-fold increase in body size in a short period; its name becomes *Hieraaetus moorei*. New Guinean *weiski*, while related, sat outside this group.

New species recorded and accepted by BARC that were not included in Christidis and Boles (1994) are *Pernis ptilorynchus* from Christmas Island (Clarke 2003; BARC 335) and Kakadu National Park (Dooley 2005c; BARC 477). This is placed in the list following *Lophoictinia* and *Hamirostra*. Reports of *Accipiter gularis* (Japanese Sparrowhawk) from Christmas Island and *A. poliocephalus* (Grey-headed Goshawk) from Saibai Island, Torres Strait, were not accepted by BARC, nor were earlier reports of *Circus spilonotus* (Papuan Harrier) and *Butastur indicus* (Grey-faced Buzzard) from Australia. *Butastur teesa* (White-eyed Buzzard) is retained on the supplementary list on the basis of a specimen purportedly from the Blue Mountains, but generally considered to be mislabelled (Marchant and Higgins 1993).

Pandion cristatus	Eastern Osprey
Elanus axillaris	Black-shouldered Kite
Elanus scriptus	Letter-winged Kite
Lophoictinia isura	Square-tailed Kite
Hamirostra melanosternon	Black-breasted Buzzard
Pernis ptilorynchus	Oriental Honey-buzzard$^{V,C/V}$
Aviceda subcristata	Pacific Baza
Haliaeetus leucogaster	White-bellied Sea-Eagle
Haliastur sphenurus	Whistling Kite
Haliastur indus	Brahminy Kite
Milvus migrans	Black Kite
Accipiter fasciatus	Brown Goshawk
Accipiter cirrocephalus	Collared Sparrowhawk
Accipiter hiogaster	Variable Goshawk^{C}
Accipiter novaehollandiae	Grey Goshawk

Circus assimilis	Spotted Harrier
Circus approximans	Swamp Harrier
Erythrotriorchis radiatus	Red Goshawk
Butastur teesa	White-eyed Buzzard^{S}
Aquila gurneyi	Gurney's Eagle$^{TS/V}$
Aquila audax	Wedge-tailed Eagle
Hieraaetus morphnoides	Little Eagle

ORDER FALCONIFORMES

Reasons for the segregation of the falcons in an order (Falconiformes) separate from the other diurnal birds of prey (Accipitriformes) were addressed in the introductory section on Higher-Level Avian Systematics.

Family Falconidae

Griffiths (1999) undertook a combined analysis of cytochrome-*b* DNA sequence data (Griffiths 1997) and syringeal morphology (Griffiths 1994) to examine the higher-level systematics within the Falconidae. Two subfamilies were recognised: Herpetherinae (Laughing Falcon and forest-falcons); and Falconinae (tribe Caracarini: caracaras; and tribe Falconi: pygmy-falcons, falconets, kestrels and falcons). This differs from the treatment in Ferguson-Lees *et al.* (2001), who treated Herpetherinae, Caracarini and Falconi each as families. These authors used Daptiiridae instead of Caracaridae for the caracaras, although according to Bock (1994) Polyboridae has priority. Wink and Sauer-Gürth's (2004) phylogeny, which was based on cytochrome-*b* sequence data, recovered the Laughing Falcon and forest-falcons as the sister lineage to the remaining members of the family. The caracaras, in turn, had a sister relationship to a clade of *Falco* plus the pygmy-falcons and falconets. These authors divided the Falconidae into two subfamilies – the Falconinae and Polyborinae.

Seibold *et al.* (1993) analysed DNA sequences of the cytochrome-*b* gene in several species of *Falco*, but the only Australian species included was *F. peregrinus* (Peregrine Falcon). Wink and Sauer-Gürth (2004) distinguished five major clades in the genus *Falco*: kestrels, merlins, hobbies, hierofalcons and peregrines. There were also a few smaller subclades that fell outside these. Of the five major clades, all but merlins are represented in Australia. Kestrels are a sister group to the remaining taxa in *Falco*. Peregrines and hierofalcons are sister clades. *Falco subniger* (Black Falcon) appears to belong in the latter clade (Wink and Sauer-Gürth 2004; Wink *et al.* 2004b; Nittinger *et al.* 2005; cf. Stresemann and Amadon 1979). The hobbies are somewhat removed from these groups, but are still a component of a more inclusive clade. *Falco berigora* (Brown Falcon) is an outlier of this clade, and forms a pair with *F. femoralis* (Aplomado Falcon, Central and South America) among taxa included in the study, but these are not components of one of the five major clades. *F. hypoleucos* (Grey Falcon) has not yet been included in any recent study. Olsen *et al.* (1989), employing feather keratin electrophoresis, found an association of this species with *F. subniger*. The species sequence reflects these arrangements.

A report of *F. subbuteo* (Eurasian Hobby) from Ashmore Reef was found to be a vagrant *F. peregrinus* of a migrant Northern Hemisphere subspecies (BARC 414). Johnstone and Storr (1998) noted a sight record from off the north-western Western Australian coast. This species is included on the supplementary list, awaiting assessment of the records.

Falco cenchroides	Nankeen Kestrel
Falco berigora	Brown Falcon
Falco longipennis	Australian Hobby
Falco subbuteo	Eurasian Hobby^{S}
Falco hypoleucos	Grey Falcon
Falco subniger	Black Falcon
Falco peregrinus	Peregrine Falcon

ORDER GRUIFORMES

Following Olson and Steadman (1981) and Sibley and Ahlquist (1990), Christidis and Boles (1994) transferred the Pedionomidae to the Charadriiformes. This action is maintained here. The Turnicidae are also placed in the Charadriiformes – rather than retained in the Gruiformes or placed in their own order (Turniciformes) – based on Paton *et al.* (2003), Cracraft *et al.* (2004) and Fain and Houde (2007), among others (see section on Higher-Level Avian Systematics). With the removal of these families, the Gruiformes are represented in Australia by three families – the Gruidae, Rallidae and Otididae.

Family Gruidae

The Gruidae (cranes) are generally divided into two subfamilies (e.g. Peters 1934; Sibley and Monroe 1990; Archibald and Meine 1996; Livezey 1998; Dickinson 2003): Balearicinae (*Balearica*; crowned cranes) and Gruinae (*Bugeranus*, *Anthropoides*, *Grus*; typical cranes).

Two species occur in Australia *Grus antigone* (Sarus Crane) and *G. rubicunda* (Brolga). As noted by Christidis and Boles (1994), *Grus* is feminine and *rubicunda* is the correct spelling.

On the basis of unison calls, Archibald (1976) linked these two in a species group together with *G. vipio* (White-naped Crane). Based on phenetic analyses of external morphological and osteological characters, Wood (1979) obtained a close association between only *G. antigone* and *G. rubicunda*. Data from both DNA–DNA hybridisation (Krajewski 1989) and mitochondrial cytochrome-*b* DNA sequences (Krajewski and Fetzner 1994) confirmed the close association among *G. vipio*, *G. antigone* and *G. rubicunda*. There is a lack of agreement on the finer resolution of relationships among these species. Treatment of *G. antigone* and *G. rubicunda* as sister species is consistent with external appearance and morphology (e.g. Wood 1979), whereas DNA–DNA hybridisation data (Krajewski 1989) identified *G. antigone* and *G. vipio* as sister taxa, and cytochrome-*b* sequence data (Krajewski and Fetzner 1994; Krajewski and Wood 1995; Wood and Krajewski 1996) linked *G. vipio* with *G. rubicunda*. More work is needed to resolve these relationships.

No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Grus antigone	Sarus Crane
Grus rubicunda	Brolga

Family Rallidae

Generic and specific limits within the Rallidae are poorly understood, and the several comprehensive classifications that have been proposed differ markedly in the number of genera and species admitted. Sharpe (1894) listed 50 genera and 165 species, while Peters (1934) recognised 52 genera and 138 species. Olson (1973) undertook a detailed, largely osteological study on the family and reduced the number of genera to 35. Ripley (1977) further reduced this to 18, but his classification was not based on any explicit character analysis. Sibley and Monroe (1990) incorporated some changes to the arrangement of Olson (1973), listing 34 genera and 142 species – an arrangement accepted by Taylor (1996, 1998). Christidis and Boles (1994) and Dickinson (2003) largely followed Olson (1973).

The results of two relatively recent studies necessitate a reappraisal of some of the generic and species limits accepted for the Australian region by Christidis and Boles (1994). Trewick (1997) examined relationships within the *Gallirallus–Rallus* and the *Porphyrio* groups using DNA sequence data from the mitochondrial cytochrome-*b* (246 base pairs) and 12S ribosomal (388 base pairs) genes. This study was limited in the amount of DNA sequence compared and the taxonomic sampling. Livezey (1998) undertook a taxonomically comprehensive study of the Rallidae using a large number of osteological, plumage and other morphological characters. He recognised 38 extant genera in two subfamilies: the Himantornithinae with a single species, *Himantornis haematopus* (Nkulenga Rail), and the Rallinae, comprising the remaining genera. A similar subfamilial treatment was first advocated by Olson (1973), and it is followed here. Olson (1973) did not designate tribes, but Livezey (1998) recognised four tribes in the Rallinae. These are at variance with the current consensus of relationships (see following discussion) and require corroboration by other data sets.

Here the findings of the studies cited above are discussed in relation to the genera and species recorded from Australia.

Resolution of the composition of, and relationship between, *Rallina* (Asia, Australasia) and *Rallicula* (New Guinea) has not been attained. Peters (1934) recognised both, but they were combined by Ripley (1977). Olson (1973) placed the species of *Rallicula*, together with *Mentocrex kioloides* (Madagascar Woodrail), in the African genus *Canirallus*. Subsequent authors accepted inclusion of *kiolodes* in *Canirallus*, but not that of *Rallicula* species. Most followed Ripley (1977) by merging *Rallicula* with *Rallina* (e.g. Beehler and Finch 1985; Sibley and Monroe 1990; Taylor 1996, 1998; Dickinson 2003). Livezey (1998) recorded a sister relationship between *Rallicula* and the African genus *Sarothrura* (flufftails). His analyses could not demonstrate monophyly for *Rallina*. Given the conflicting treatments, it is probably best to treat *Rallicula* and *Rallina* as separate genera until additional information is obtained. Within Australia, *Rallina tricolor* (Red-necked Crake) is resident and *R. fasciata* (Red-legged Crake) has been recorded as a vagrant. Both belong to *Rallina* (*sensu stricto*).

Although listing *G. troglodytes* as a species, Peters (1934) considered it more likely that this was a colour morph of *G. australis* (Weka), and this was subsequently shown to be the case (e.g. Oliver 1955). Olson (1973) expanded *Gallirallus* to incorporate several species from the Australasian and Pacific region that were traditionally placed in other genera. Among these was *philippensis* (Buff-banded Rail). Peters (1934), Condon (1975) and Ripley (1977) included this species in *Rallus*, but most subsequent authors have adopted Olson's (1973) action and maintained it in *Gallirallus* (e.g. Sibley and Monroe 1990; Christidis and Boles 1994; Taylor 1996, 1998; Livezey 1998; Dickinson 2003).

Peters (1934) included *sylvestris* (Lord Howe Woodhen) in *Tricholimnas*, along with *lafresnayanus* (New Caledonian Rail) and *conditicius* (Gilbert Rail) – a treatment followed by Ripley (1977) and Fullagar *et al.* (1982) and supported by the analyses of Livezey (1998). Olson (1973) argued that there was no close association between *sylvestris* and the other putative members of *Tricholimnas*, instead placing the former in *Gallirallus*. This was adopted by Marchant and Higgins (1993) and Christidis and Boles (1994). Sibley and Monroe (1990), Taylor (1996,1998) included all members of *Tricholimnas* in *Gallirallus*. Olson (1992) showed that *conditicius* was not a valid species – the unique specimen being based on a mislabelled individual of *sylvestris*.

Trewick (1997) identified a strongly linked clade including *G. sylvestris*, *G. philippensis*, *G. owstoni* (Guam Rail) and two extinct rails from the Chatham Islands: *G. dieffenbachii* (Dieffenbach's Rail) and *G. modestus* (Chatham Rail). Peters (1934) allocated *dieffenbachii* and *modestus* in the monotypic genera *Nesolimnas* and *Cabalus*, respectively. Ripley (1977) maintained both in *Rallus* – the former as a subspecies of *philippensis*. Livezey (1998) and Holdaway *et al.* (2001) retained *modestus* in *Cabalus* and treated *dieffenbachii* as a species in *Gallirallus*. Trewick (1997) showed *dieffenbachii* to be a separate species from *philippensis*, but generic recognition of *Cabalus* is at odds with the DNA data. This study supported the generic treatment proposed by Olson (1973), which placed all these species in *Gallirallus*. It also found a link between *Gallirallus* and *Rallus* (represented by *R. aquaticus*, Water Rail). Trewick (1997) also found that another member of the *Gallirallus* clade was the New Guinea Flightless Rail *ineptus*, which is usually placed in the monotypic genus *Megacrex* (Sibley and Monroe 1990; Taylor 1996, 1998; Dickinson 2003), but sometimes included in *Amaurornis* (Ripley 1977; Livezey 1998) or *Habroptila* (Olson 1973).

Here Olson's (1973) circumscription of *Gallirallus* is adopted (see also Sibley and

Monroe 1990; Taylor 1996, 1998; Dickinson 2003). Three species of *Gallirallus* have been recorded from Australia: *philippensis*, *sylvestris* (Lord Howe Island) and *australis* (introduced to Macquarie Island, now extirpated).

Another unsettled issue is the generic position of '*Rallus*' *pectoralis* (Lewin's Rail) – this species has been assigned to four different genera in recent years. Peters (1934), Condon (1975) and Ripley (1977) included it in *Rallus*, whereas Olson (1973), followed by White and Bruce (1986) and Marchant and Higgins (1993), aligned it generically with *Dryolimnas cuvieri* (White-throated Rail) of Madagascar. Sibley and Monroe (1990) placed it in *Lewinia*, with *mirificus* (Brown-banded Rail; Luzon, Philippines) and *muelleri* (Auckland Rail; Auckland Island); this placement was accepted by Taylor (1996, 1998) and Dickinson (2003). Christidis and Boles (1994) and Inskipp *et al.* (1996) retained *pectoralis* and its allies in *Rallus* pending further work. Livezey (1998) placed the '*Lewinia*' group in *Gallirallus*. Given the uncertainty over the generic placement of *pectoralis* and conflicting treatments, it is prudent to adopt a middle ground. Sibley and Monroe (1990) are followed in recognising *Lewinia* because this makes fewer implied assumptions regarding relationships. More work on this group is required.

Two records of *Crex crex* (Corncrake) are known from Australia, one of which may have been ship-assisted (Mayr 1949; Marchant and Higgins 1993). Christidis and Boles (1994) included this species on the Supplementary, rather than main, Australian list, incorrectly citing Marchant and Higgins (1993) as the source for non-acceptance; however, the reference was actually related to records from New Zealand. As at least one of the records from Australia was not ship-assisted, *Crex crex* is here included on the Australian Species List. McAllan and Bruce (1989) suggested that both Australian records could represent aviary escapees.

Defining the composition of, and separation between, *Amaurornis* and *Porzana* has been contentious, with several non-Australian species being placed at times in both genera. Peters (1934) included the following species in *Amaurornis*: *akool* (Brown Crake), *isabellina* (Isabelline Bush-hen), *olivacea* (Bush-hen) and *phoenicurus* (White-breasted Waterhen). (*Amaurornis* is feminine [David and Gosselin 2002b]; this results in changes to the ending of several specific names, but not *phoenicurus*, which is a noun and thus invariable.) Condon (1975) placed *olivacea* in *Gallinula,* but offered no justification for this nor gave any indication whether other species of *Amaurornis* should also be transferred to *Gallinula*. Taylor (1998) expanded Peters' *Amaurornis* to include *olivieri* (Sakalava Rail), *flavirostris* (Black Crake) and *bicolor* (Black-tailed Crake).

Generic delimitation of *Porzana* has been equally unsettled. Peters (1934) included 13 species, but also allocated a number of crake-like species to monotypic genera: *Poliolimnas*, *Aenigmatolimnas*, *Limnocorax*, *Porzanula*, *Pennula*, *Neocrex*, *Nesophylax* and *Aphanolimnas*. Olson (1985) regarded a number of Peters' monotypic genera as inseparable from *Porzana* – being mainly flightless island forms.

Condon (1975) placed *cinereus* (White-browed Crake) in *Poliolimnas*, as did Olson (1970, 1973), who also transferred Neotropical *flaviventer* (Yellow-breasted Crake) to this genus. Mees (1982b) argued that some of the characters cited by Olson (1970) to separate *Poliolimnas* from *Porzana* were affected by specimen preparation. Although Steadman (1987) reported small osteological differences between *Poliolimnas* and *Porzana*, it was not clear whether these warranted generic separation. Most authors (Ripley 1977; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Inskipp *et al*. 1996; Taylor 1996, 1998; Livezey 1998; Dickinson 2003) kept this species in *Porzana* (as *P. cinerea*).

Livezey (1998) combined *Aenigmatolimnas* and *Neocrex* with *Porzana*, while transferring *flaviventer* from *Micropygia*. Most of Peters' monotypic genera were merged with *Porzana* by Taylor (1998).

Relationships within the *Amaurornis–Porzana* assembly were examined by Slikas *et al*. (2002) using DNA sequences from three portions of the mitochondrial genome. They included seven species of *Amaurornis*, 13 *Porzana*, two *Poliolimnas* and *Aenigmatolimnas marginalis* (Striped Crake; Africa) (following classification of Taylor 1998). Their results found three main clades, with neither *Amaurornis* nor *Porzana* being monophyletic. Clade 1 comprised *Porzana porzana* (Spotted Crake), *fluminea* (Australian Crake) and *carolina* (Sora Rail). Clade 2 contained *Amaurornis phoenicurus*, *olivacea* and *isabellina*. Associated with these species, with moderate statistical support, was the pair of *Poliolimnas cinereus* and *A. marginalis*. The remaining species of *Amaurornis* and *Porzana* made up clade 3.

These findings do not correspond with any of the proposed generic classifications. They could be expressed by maintaining all the species in one genus, which would take the earliest name *Porzana* Vieillot, 1896. Alternatively, the three main clades could be each recognised generically, with the following names: clade 1, *Porzana* (type species *porzana* Linnaeus, 1766); clade 2, *Amaurornis* Reichenbach, 1853 (type species, *olivacea* Meyen, 1834); and clade 3, *Limnocorax*, Peters 1854 (type species *flavirostris* Swainson, 1837). Here three genera are accepted.

The *Amaurornis olivacea* complex occurs in the Philippine Archipelago, Moluccan Islands, New Guinean region and Australia. Peters (1934), Ripley (1977) and White and Bruce (1986) recognised one species. McAllan and Bruce (1989) considered that Australasian populations were best treated as a separate species, *A. moluccana*, but presented no supporting evidence. Wolters (1975–1982) also failed to provide justification for splitting the complex into two species. Marchant and Higgins (1993), Christidis and Boles (1994) and Inskipp *et al*. (1996) accepted only one species, while Sibley and Monroe (1990), Taylor (1996, 1998) recognised two. Livezey (1998) treated all as subspecies of *A. olivacea*.

Lambert (1998) provided the first detailed assessment of the taxonomy of the complex based on calls, morphometrics and plumage. He considered that the data supported recognition of two species: *A. olivacea* (Philippine Islands) and *A. moluccana* (elsewhere). He also described an additional species, *A. magnirostris* (Talaud Bush-hen) from the Talaud Islands, Indonesia, where it was sympatric with *A. moluccana*. Dickinson (2003) did not follow Lambert's (1998) action, considering the subspecies *magnirostris* to be a link between *moluccana* and *olivacea*, and commented that a more detailed case to split these forms into different species needed to be made. Lambert's (1998) revision is adopted here in recognising three species.

Sibley and Monroe (1990) aligned the *A. moluccana–olivacea* group most closely with *A. isabellina*, whereas Lambert (1998) noted several plumage similarities between *A. akool* (= *P. akool*) and the *A. moluccana–olivacea* group. In the analyses of Livezey (1998), the *A. moluccana–olivacea* group was the sister lineage to the other species in the genus.

Lambert (1998) suggested the English names Philippine Bush Hen for *Amaurornis olivacea* and Pale-vented Bush Hen for *A. moluccana*, as the respective current names – Rufous-tailed Bush-hen and Plain Bush-hen – are inappropriate; both species have similar coloured tails and all bush-hens are plain. Here the English names suggested by Lambert (1998) are accepted, with the exception that the hyphenated group name 'bush-hen' is retained. Dickinson (2003) used Plain Bush-hen for the combined species.

Amaurornis phoenicurus, included by Christidis and Boles (1994) as a vagrant, is now established as a breeding bird on Christmas Island (Carter 1994a) and on Cocos (Keeling) Islands (Dooley 2005c; Hadden 2006).

The five species of *Porzana* listed for Australia by Christidis and Boles (1994) were allocated to four subgenera by Livezey (1998). *Porzana fusca* (Ruddy-breasted Crake) – a vagrant to Christmas Island (Marchant and Higgins 1993) – was placed in subgenus *Corethrua*. *Porzana tabuensis* (Spotless Crake) was included in the subgenus *Limnocorax* (which also included *flavirostris*, *olivieri* and *bicolor*), and both *P. pusilla* (Baillon's Crake) and *fluminea* (Australian Spotted Crake) in subgenus *Porzana*. *Porzana cinerea* was placed in subgenus *Poliolimnas* (but here included in *Amaurornis*).

In the results of Slikas *et al.* (2002), *P. tabuensis* grouped with several flightless insular forms, indicating that all had diverged rather recently from the same lineage.

Porzana pusilla was closely related to the extinct flightless *P. palmeri* (Laysan Crake). The average sequence divergence within *pusilla* is greater than that between it and *palmeri*. In some analyses, *pusilla* is paraphyletic relative to *palmeri*, albeit with weak support. Rasmussen and Anderton (2005) commented that populations segregated as *P. pusilla*, including those in southern Asia, may involve more than one species.

As with most rails in monotypic genera, the affinities of *Eulabeornis castaneoventris* (Chestnut Rail) are not well understood. Olson (1973) aligned it with *Habroptila wallacii*, *Megacrex inepta* and *Amaurornis*. In terms of overall appearance and biogeography, a proposed association between New Guinean *ineptus* and *castaneoventris* (northern Australia, Aru Islands) is understandable. Livezey (1998) associated *Eulabeornis* with several South American (*Aramides*, *Anurolimnas*, *Amaurolimnas*) and African (*Canirallus*, *Rougetius*) genera. Although such an association may be correct, it is more difficult to reconcile biogeographically. The apparent characters linking *Eulabeornis* with these genera could reflect convergence and not phylogenetic history.

The conventional assumption that the swamphens (*Porphyrio* and allies) and moorhens (*Gallinula* and allies) are closely related (e.g. Olson 1973) is reflected in the sequence of genera of most works (e.g. Ripley 1977; Sibley and Monroe 1990; Taylor 1996, 1998; Dickinson 2003). Livezey (1998), however, placed the swamphens in their own tribe (Porphyriornithini) and included the moorhens as part of the large tribe Rallini, which also included *Porzana*, *Amaurornis*, *Rallus* and *Gallirallus*. He also concluded that the Porphyriornithini was the first lineage to diverge in the subfamily Rallinae. The DNA–DNA hybridisation studies of Sibley and Ahlquist (1990) weakly located *Porzana* and *Amaurornis* closer to *Porphyrio* than to *Gallinula*, *Fulica* and *Gallicrex*. *Rallus* and *Gallirallus* both occupied more basal positions relative to this group.

Peters (1934) recognised *Porphyrio*, *Notornis* and *Porphyrula* for the swamphens. Olson (1973) treated all as a single genus, *Porphyrio*. Ripley (1977) combined *Notornis* with *Porphyrio* and *Porphyrula* with *Gallinula*. The inclusion of *Porphyrula* in *Gallinula* has been ignored by most authors, and the 12S ribosomal gene sequence data of Trewick (1997) confirmed the close association between *Porphyrula* and *Porphyrio–Notornis*. Most authors followed Olson (1973) in treating *Notornis* and *Porphyrula* as part of *Porphyrio* (e.g. Sibley and Monroe 1990; Taylor 1996, 1998; Dickinson 2003). Olson (1973) commented that the members of *Porphyrula* were distinct enough to warrant retention as a separate subgenus. Livezey (1998) combined *Notornis* with *Porphyrio,* but retained *Porphyrula* as a genus. *Notornis*, according to Trewick's (1997) sequence data, is embedded in the *Porphyrio porphyrio* (Purple Swamphen) complex. As in Christidis and Boles (1994), it is treated here as part of *Porphyrio*.

Based on the findings of Trewick (1997), re-assessments of the species limits within the *Porphyrio porphyrio* and *P. mantelli* (Takahe), as currently delimited, are required. Peters (1934) recognised five species in *Porphyrio* (*sensu stricto*): *P. porphyrio* (Europe), *P. madagascarensis* (Africa), *P. poliocephalus* (Asia, Australasia, Pacific islands), *P. pulverulentus* (Philippines) and *P. albus* (Lord Howe Island). Most authors have treated all forms, except *albus* (White Gallinule), as part of the widespread species *P. porphyrio* (e.g. Condon 1975; Ripley 1977; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Taylor 1996, 1998; Livezey 1998; Dickinson 2003).

According to Trewick (1997), *P. porphyrio* as currently defined is paraphyletic with respect to *P. mantelli*. Although he did not examine nominate *porphyrio*, he included representatives from the *madagascarensis*, *poliocephalus* (represented by *seistanicus* and *melanotus*) and *pulverulentus* groups. Analysis of sequence data identified *madagascarensis* as the first diverging lineage, followed by *P. mantelli hochstetteri*. This was followed by an assemblage comprising *P. m. mantelli*, *P. p. seistanicus*, *P. p. melanotus* and *P. p. pulverulentus*. Because the 12S ribosomal gene is slowly evolving, it is limited in its ability to elucidate relationships within, and between, closely related species. The purported paraphyly of *P. porphyrio* may be an artefact of the constrained resolving power of the gene used.

Nevertheless, from consideration of the DNA data, biogeography and plumage patterns, a case could be made for dividing *P. porphyrio* into the following species: *P. porphyrio* (including *madagascarensis*; Europe, Africa), *P. poliocephalus* (including *pulverulentus*; Asia, Philippines) and *P. melanotus* (Moluccas, New Guinea, Australia, Pacific islands). Sangster (1998) and Sangster *et al.* (1999) went further and recognised six species: *P. porphyrio*, *P. madagascarensis*, *P. poliocephalus* (tentatively including *caspius* and *seistanicus*), *P. pulverulentus*, *P. indicus* (tentatively including *viridis*) and *P. melanotus* (tentatively including *bellus*, *chathamensis*, *melanopterus*, *pelewensis* and *samoensis*). Rasmussen and Anderton (2005) considered that this complex included several species, but the lines between them were not obvious. Unfortunately, there are not enough critical data to justify any of these treatments at present. Consequently, the three conventional species in *Porphyrio* are maintained here: *porphyrio*, *mantelli* and *albus*, although it is quite likely that these comprise paraphyletic groupings. Holdaway *et al.* (2001) followed Trewick (1997) in treating *hochstetteri* (South Island Takahe) and *mantelli* (North Island Takahe) as separate species.

The affinities of *P. albus* also need to be resolved. It has been regarded as a subspecies of *P. porphyrio* (Greenway 1967) or treated as a separate species with affinities to either the '*Porphyrio*' group (Peters 1934; Livezey 1998) or the '*Notornis*' group (Ripley 1977). It is provisionally retained here as a separate species, which is aligned with the '*Porphyrio*' group. Note that it lacks the highly modified morphology of the bill and legs that characterises '*Notornis*' (= takahes).

Six genera of moorhens and their allies (*Porphyriops*, *Tribonyx*, *Gallinula*, *Porphyriornis*, *Pareudiastes*, *Edithornis*) were recognised by Mayr (1933) and Peters (1934). Olson (1973) merged *Edithornis* with *Pareudiastes* and the remaining genera with *Gallinula*. Ripley (1977) included all the moorhen genera (also including *Porphyrula*) in *Gallinula*. Christidis and Boles (1994) commented that a case could be made for treating *Tribonyx* as a separate genus, noting that its members were distinct enough in external characters for it to be retained as a subgenus (Olson 1973). Boles (2005), however, found no characters of the appendicular skeleton on which these could be separated. The DNA–DNA hybridisation studies of Sibley and Monroe (1990) supported a sister relationship between *Gallinula* (*sensu stricto*) and *Fulica* and linked these with *Gallicrex*.

For *Gallinula*, most authors adopted the circumscription advocated by Olson (1973), except the inclusion of *Pareudiastes* in the genus (e.g. Sibley and Monroe 1990; Taylor 1996, 1998; Dickinson 2003). According to the morphological analyses by Livezey (1998), this circumscription of *Gallinula* is paraphyletic. *Gallinula* (*sensu stricto*) and *Porphyriornis* are part of a clade that includes *Fulica* (coots) to the exclusion of the other '*Gallinula*' lineages. Furthermore, *Gallicrex cinerea* (Watercock) is embedded within *Gallinula* (*sensu lato*). Livezey (1998) recognised the following genera in the subtribe Fulicarina in addition to *Fulica*:

- *Gallicrex* (*G. cinerea*),
- *Porphyriops* (*P. melanops*, Spot-flanked Moorhen),
- *Pareudiastes* (*P. pacificus*, Samoan Moorhen; *P. silvestris*, San Cristobal Moorhen),
- *Tribonyx* (*T. ventralis*, Black-tailed Native-hen; *T. mortierii*, Tasmanian Native-hen),
- *Gallinula* (*G. tenebrosa*, Dusky Moorhen; *G. chloropus*, Common Moorhen; *G. angulata*, Lesser Moorhen; *G.* (*Porphyriornis*) *nesiotis*, Tristan Moorhen).

Many of the branching patterns within the Fulicarina group of Livezey (1998) lacked strong statistical support. Nonetheless, it provides the most recent assessment of generic composition in the group and avoids potential paraphyletic groupings. Consequently the treatment of Livezey (1998) is adopted for the recognition of each group at generic level, although this action warrants further investigation.

Gallinula tenebrosa (Dusky Moorhen) and *Gallinula chloropus* (Common Moorhen) are generally treated as separate species (e.g. Peters 1934; Condon 1975; Ripley 1977; White and Bruce 1986; Sibley and Monroe 1990; Christidis and Boles 1994; Taylor 1996, 1998; Livezey 1998). One of the main diagnostic characters separating the two species is differences in the colours of the bare parts. Another is that *chloropus* always has continuous white flank stripes while in *tenebrosa* these are rarely present, but do occur occasionally (Cox 1973; Eskell and Garnett 1979; Marchant and Higgins 1993). Eskell and Garnett (1979) suggested that expression of this character may be related to age, and they and White (1976) noted that soft part colours were highly variable among individuals and thus not reliable for species or subspecies diagnosis. Conventionally applied plumage and soft part colour differences separating the two forms are probably not as clear-cut as often assumed – with age, wear and intraspecific variation complicating the situation. Although James (1993b) noted that *tenebrosa* was larger than *chloropus*, this is true only for nominate *tenebrosa*; the form from northern New Guinea (*neumanni*) is similar in size to *chloropus*. Another factor cited for retaining *chloropus* and *tenebrosa* as separate species is their apparent sympatry in parts of Wallacea and Borneo (summarised in White 1976). Given the variation observed among individuals within a taxon, and the possibility of resulting misallocation of observations to species, the evidence for sympatry needs to be assessed. It may reflect temporal displacement of *tenebrosa* by *chloropus* (James 1993b), as the records of the two forms from the one locality are usually separated by several years (White 1976; White and Bruce 1986).

The evidence for treating *tenebrosa* as a species separate from *chloropus* is not strongly compelling. It could be argued on biogeographical grounds that the African and Eurasian populations of *chloropus* more likely have closer affinities to *tenebrosa* than they do to the New World populations of *chloropus*. It may eventually prove preferable to treat *tenebrosa* and *chloropus* as a single species. The relationship between Old and New World populations of *chloropus* also need to be re-assessed (Rasmussen and Anderton 2005). There are insufficient data at present to confidently choose among these alternatives, and for the present *tenebrosa* is retained as a species pending more detailed study.

Rasmussen and Anderton (2005) indicated that the Australian form (*australis*) of *Fulica atra* (Eurasian Coot) exhibited sufficient morphological and vocal differences from northern populations that it was probably better considered a separate species. This proposal awaits further investigation.

A recent record of *Gallicrex cinerea* from Cocos (Keeling) Islands is awaiting consideration by BARC.

The generic sequence largely follows the classification of Livezey (1998) with *Lewinia* placed before *Gallirallus*.

Porphyrio porphyrio	Purple Swamphen
Porphyrio albus	White Gallinule$^{LH/E}$
Eulabeornis castaneoventris	Chestnut Rail
Rallina tricolor	Red-necked Crake
Rallina fasciata	Red-legged Crake^{V}
Lewinia pectoralis	Lewin's Rail
Gallirallus philippensis	Buff-banded Rail
Gallirallus australis	Weka$^{S(M/I/E)}$
Gallirallus sylvestris	Lord Howe Woodhen^{LH}
Crex crex	Corncrake^{V}
Porzana pusilla	Baillon's Crake
Porzana fluminea	Australian Spotted Crake
Porzana fusca	Ruddy-breasted Crake$^{C/V}$
Porzana tabuensis	Spotless Crake
Amaurornis cinerea	White-browed Crake
Amaurornis moluccana	Pale-vented Bush-hen
Amaurornis phoenicurus	White-breasted Waterhen$^{/V,C,CK}$
Gallicrex cinerea	Watercock$^{C/V,(CK/V)}$
Tribonyx ventralis	Black-tailed Native-hen
Tribonyx mortierii	Tasmanian Native-hen
Gallinula tenebrosa	Dusky Moorhen
Fulica atra	Eurasian Coot

Family Otididae

Pitra *et al.* (2002) examined phylogenetic relationships among the bustards using mitochondrial (cytochrome-*b* and control region) and nuclear (CHD1) DNA sequence data. *Ardeotis* – the only genus represented in Australia – and the African genus *Neotis* formed a well-supported clade. Relationships within this clade were not strongly resolved and neither genus was identified as monophyletic. Although all taxa of *Ardeotis* were part of the same clade, *Neotis heuglinii* (Heuglin's Bustard; north-eastern and eastern Africa) was embedded within the group, and *Neotis nuba* (Nubian Bustard; north-western Africa) was a sister species to the remaining *Neotis–Ardeotis* assemblage. Further work may indicate that *Neotis* and *Ardeotis* should be merged, but for now they are regarded as separate genera.

The generic phylogeny of bustards was investigated by Broders *et al.* (2003) using cytochrome-*b* DNA sequences from 11 species from seven of the genera maintained by Collar (1996). *Neotis* species were not included in this study. *Ardeotis* was represented by *A. kori* (Kori Bustard; southern and eastern Africa) and *A. arabs* (Arabian Bustard; northern sub-Saharan Africa and south-west Arabian Peninsula) – *A. australis* (Australian Bustard) was not included in the study. *Ardeotis* paired with *Eupodotis rueppelli* (Rüppell's Bustard; southern Africa), although *E. senegalensis* (White-bellied Bustard; Africa) was well removed in the phylogeny, implying polyphyly of this genus. *Chlamydotis* and *Otis* formed a sister pair, as did *Lophotis* and *Tetrax*. These results do not support the placement of *australis* in *Otis* (*contra* Johnstone and Storr 1998).

How many species should be accepted in *Ardeotis* has been subject to markedly contrasting views. Meinertzhagen (1954), for example, treated them all as subspecies of *A. arabs*, and Schodde and Tidemann (1996) regarded *kori*, *nigriceps* (Great Indian Bustard) and *australis* as one species (*A. kori*), while retaining *A. arabs* separate. Broders *et al.* (2003) included only two species in their study, but genetic distances recovered were comparable to those between species in other genera. Most authors (e.g. Peters 1934; Sibley and Monroe 1990; Johnsgard 1991; Collar 1996; Dickinson 2003) recognised four species. Snow (1978) considered these to be equally diverged from each other and treated them as a single superspecies. Johnsgard (1991) suggested that *A. australis* and *A. nigriceps* were sister species, as were *A. kori* and *A. arabs*.

Within *Ardeotis*, the DNA data of Pitra *et al.* (2002) were consistent with the two groups of sister species identified by Johnsgard (1991): (1) *A. arabs* and *A. kori*; and (2) *A. nigriceps* and *A. australis*, with the latter association strongly supported, and the former somewhat less. No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Ardeotis australis	Australian Bustard

ORDER CHARADRIIFORMES

Other than some recent transfers of families to the order, the composition of the Charadriiformes has been relatively stable since the treatment of Peters (1934). He divided it into three suborders: Charadrii, Lari and Alcae. The Charadrii was the most diverse and comprised the Jacanidae (jacanas), Rostratulidae (painted snipe), Dromadidae (Crab Plover), Haematopodidae (oystercatchers), Ibidorhynchidae (Ibisbill), Recurvirostridae (stilts and avocets), Burhinidae (stone-curlews and thick-knees), Glareolidae (pratincoles and coursers), Charadriidae (plovers, lapwings and dotterels), Scolopacidae (sandpipers, stints, snipe, curlews and allies), Phalaropodidae (phalaropes), Thinocoridae (seedsnipe) and Chionidae (sheathbills). The Lari comprised the Stercorariidae (skuas and jaegers), Laridae (gulls, terns and noddies) and Rynchopidae (skimmers), while the Alcae comprised only the Alcidae (auks, puffins, murrelets and allies). The Phalaropodidae were subsequently merged in the Scolopacidae following Jehl (1968a).

The transfer of the Pedionomidae (Plains-wanderer) from the Gruiformes (rails, cranes, bustards, button-quail and allies) to the Charadriiformes, based on morphological (Olson and Steadman 1981) and DNA–DNA hybridisation (Sibley and Ahlquist 1990) data, has been well accepted. Preliminary analyses of cranial and vertebral osteological characters by Livezey and Zusi (2001) aligned the Burhinidae with the Gruiformes and not the Charadriiformes. This intriguing possibility requires further corroboration and is not incorporated here. The ordinal placement of the Turnicidae remains contentious (see Higher-Level Avian Systematics). This family's inclusion here follows Paton *et al.* (2003), Paton and Baker (2006) and Cracraft *et al.* (2004).

Proposed affinities among the charadriiform families have varied considerably among authors. Jehl (1968a) examined downy young plumage patterns within the Charadrii and concluded that the Haematopidae, Ibidorhynchidae, Recurvirostridae, Burhinidae, Glareolidae and Charadriidae formed a close assemblage. In a detailed osteological study of the entire order, Strauch (1978) recognised three phyletic lines: the Scolopaci (Jacanidae, Rostratulidae, Scolopacidae and Thinocoridae), Charadrii (Dromadidae, Haematopidae, Ibidorhynchidae, Recurvirostridae, Burhinidae, Glareolidae, Charadriidae, Chionidae, Stercorariidae, Laridae and Rynchopidae) and Alcae (Alcidae). His conclusions were supported by a re-analysis of the data by Chu (1995). Björklund (1994) also re-analysed Strauch's (1978) data and arrived at a different phylogenetic topology – one in which the Charadriidae formed a monophyletic clade with the Scolopacidae, Jacanidae and Rostratulidae.

From analysis of DNA–DNA hybridisation data Sibley and Ahlquist (1990) identified two major clusters: the Scolopaci of Strauch (1978) (including the Pedionomidae) and an expanded Charadrii consisting of the remaining families. Moreover, based on the DNA–DNA hybridisation distances, Sibley and Monroe (1990) combined the Stercorariidae, Laridae, Rynchopidae and Alcidae as a single family. A protein allozyme study by Christian *et al.* (1992a) concluded that the Burhinidae, Haematopodidae, Recurvirostridae and Charadriidae represented an assemblage distinct from the Scolopacidae. The protein study could not confirm a close association between the Laridae and the Charadriidae assemblage, nor between the Scolopacidae and Jacanidae. This could have been due to the lack of an outgroup in their analyses.

Given its general agreement of the morphological (Jehl 1968a; Strauch 1978) and protein (Christian *et al.* 1992) studies, the family sequence of Sibley and Monroe (1990) was adopted by Christidis and Boles (1994).

Recent studies on the relationships among families of the Charadriiformes, employing several different genes, have been markedly congruent: Paton *et al.* (2003; RAG-1), Ericson *et al.* (2003a; RAG-1 and myoglobin intron), Thomas *et al.* (2004a; cytochrome-*b*), Paton and Baker (2006; 14 mitochondrial genes), Baker *et al.* (2007; over 5000 base pairs of mitochondrial and nuclear DNA sequences) and Fain and Houde (2007: over 5000 base pairs from several nuclear and mitochondrial loci.. An overview of the first two papers was given by van Tuinen *et al.* (2004) and Thomas *et al.* (2004b) applied supertree techniques to these and previous published charadriiform phylogenies.

These studies confirmed that there are three major lineages within the Charadriiformes, but the composition of these varies from that of previous authors. The first lineage comprises the Thinocoridae–Pedionomidae, Jacanidae–Rostratulidae and Scolopacidae. The first two pairs of families are sister clades, and together these are a sister group to the Scolopacidae. A second lineage contains the gulls, terns, skuas, skimmers, auks, pratincoles and button-quail. The first and second lineages are sister clades. Within the third lineage, the Recurvirostridae–Haematopodidae, together with the Charadriidae, are the sister group of the Burhinidae–Chionidae.

In the morphology-based classification of Livezey and Zusi (2007), four major subdivisions of the Charadriiformes were recognised: *Pedionomus*; jacanas and painted snipe; auks, gulls, terms, skuas and skimmers; and the remaining taxa, such as plovers, sandpipers, oystercatchers and pratincoles.

The position of *Pluvialis* varied between different analyses of Ericson *et al.* (2003a). In some trees, *Pluvialis* was the sister taxon to a clade comprising the Charadriidae and Recurvirostridae–Haematopodidae. Similar findings were obtained by Baker *et al.* (2007) and Fain and Houde (2007). Such a topology would require that *Pluvialis* be separated at family level, or that plovers, lapwings, oystercatchers, avocets and stilts be combined as a single family. Baker et al. (2007) recommended that additional work be carried out before making such a revision. If *Pluvialis* were to be segregated from the Charadriidae, the family name Pluvialidae MacGillivray, 1852, is available. Unfortunately, Paton *et al.* (2003), Paton and Baker (2006) and Thomas *et al.* (2004a) did not include *Pluvialis* in their analyses.

Family limits within the Charadriiformes have been circumscribed rather consistently, other than within the Lari as demarcated by Peters (1934). Traditionally, the Alcidae, Rhynchopidae, Stercorariidae and Laridae have been recognised as separate families. Condon (1975) and Turbott (1990) further separated the noddies into the subfamily Megalopterinae. AOU (1983) treated the Rhynchopinae, Stercorariinae, Sterninae (terns and noddies) and Larinae (gulls) as subfamilies of the Laridae. Based on DNA–DNA hybridisation distances, Sibley and Ahlquist (1990) included the Alcidae in the Laridae as a subfamily. The other subfamily, Larinae comprised four tribes: Stercorariini, Larini, Sternini and Rhynchopini (Sibley *et al.* 1988; Sibley and Monroe 1990).

Christidis and Boles (1994) followed this treatment for Australian taxa by placing all groups in the Laridae, but they did not discuss subfamily groupings. Higgins and Davies (1996) followed the subfamily treatment of AOU (1983), whereas Burger and Gochfield (1996) recognised Alcidae, Rhynchopidae, Stercorariidae, Laridae and Sternidae as families.

Most of the phenetic analyses of Schnell (1970), based on skeletal and external characters, supported the monophyly of the Larini and Sternini, as did a cladistic analysis of osteological and plumage characters by Chu (1998). Conventionally the terns and gulls have been treated as as a single assemblage relative to the skuas (e.g. Peters 1934; Wetmore 1960), and this has been confirmed by data from protein allozyme (Hackett 1989) and DNA–DNA hybridisation (Sibley and Ahlquist 1990) studies. Nevertheless, the study by Schnell (1970) recorded a sister relationship between terns and skimmers, while that of Chu (1998) found a similar relationship between terns and skuas. The studies of

Paton *et al.* (2003), Ericson *et al.* (2003a), Thomas *et al.* (2004a) and Paton and Baker (2006) found that the skuas should be recognised at family level and formed a clade with the Alcidae, rather than with the gulls. While agreeing with the association of the gulls, terns, skuas, skimmers and auks, the results of Fain and Houde (2007) were somewhat ambiguous about their relative positions within this group.

Some recent texts (e.g. Burger and Gochfield 1996; Ericson *et al.* 2003a; Pons *et al.* 2005) have accepted family level recognition for the terns and noddies, restricting the name Laridae to the gulls. This action is supported by the findings of Paton *et al.* (2003), Paton and Baker (2006) and Thomas *et al.* (2004a), in which the terns are more distant from the gulls than are the skimmers and, in some analyses, other groups. However, Baker *et al.* (2007) recovered the noddies and *Gygis* outside the gull-tern clade, challenging a family level division between those groups.

Here, the recent findings of Paton *et al.* (2003), Ericson *et al.* (2003a), Thomas *et al.* (2004a) and Paton and Baker (2006) are adopted. The gulls–terns and skuas are each separated as separate families. The sequence of Australian families is derived from the phylogenetic tree in Paton *et al.* (2003), placing the plovers and allies first.

Family Chionidae

No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994). In Australian Territory, *Chionis minor* (Black-faced Sheathbill) occurs on Heard Island.

Chionis minor	Black-faced Sheathbill^{H}

Family Burhinidae

The number of genera of Burhinidae (stone-curlews or thick-knees) recognised has varied from one to three (reviewed in Jehl 1968a). Peters (1934) recognised three genera (*Burhinus*, *Esacus*, *Orthorhamphus*), whereas Meinertzhagen (1924), Condon (1975) and Sibley and Monroe (1990) combined all three as *Burhinus*. In general, most other authors (e.g. Hayman *et al.* 1986; Marchant and Higgins 1993; Christidis and Boles 1994; Hume 1996) have accepted two genera, combining *Orthorhamphus* with *Esacus*. *Burhinus* and *Esacus* (including *Orthorhamphus*) differ in several external and osteological characters (Jehl 1968a; Bickart 1981; Cramp and Simmons 1983), and the recognition of two genera is maintained here.

Christidis and Boles (1994) reviewed the taxonomic nomenclature of the two Australian species and recommended the names *Burhinus grallarius* and *Esacus neglectus* for the Bush Stone-curlew and Beach Stone-curlew, respectively. Schodde and Mason (1981) pointed out that Latham (1802) had introduced three names for the Bush Stone-curlew, *magnirostris*, *grallarius* and *frenatus*. As first reviser, Gould (1845) chose *grallarius* and this name takes precedence over the other two. This has generally been followed by other authors (e.g. Mees 1982b; Sibley and Monroe 1990; Marchant and Higgins 1993; Hockey 1996; Dickinson 2003; *contra* Hayman *et al.* 1986).

The specific name of the Beach Stone-curlew is more problematic. The name *Orthorhamphus magnirostris* had applied to the Beach Stone-curlew, but Meinertzhagen (1924) combined *Orthorhamphus* with *Burhinus*. At the time *magnirostris* also applied to the Bush Stone-curlew, thus the action by Meinertzhagen (1924) effectively placed the use of *magnirostris* Viellot, 1818 for the Beach Stone-curlew into junior secondary homonymy of *magnirostris* Latham, 1802, which had been used earlier for the Beach Stone-curlew. Condon (1975) followed Meinertzhagen (1924) in placing the Beach Stone-curlew in *Burhinus* and in adopting the name *neglectus* Mathews, 1912. An earlier name also applicable to this species – *giganteus* Wagler, 1829 – was considered to be of uncertain identity by Meinertzhagen (1924).

The major problem arises when the Beach Stone-curlew is removed from *Burhinus* and returned to *Esacus*. Wolters (1975–1982), Sibley and Monroe (1990) and Christidis and Boles (1994) interpreted the action by Meinertzhagen (1924) as having effectively placed *magnirostris* Viellot, 1818, into permanent junior secondary homonymy. Consequently, the name was not available to be used for the Beach Stone-curlew. Christidis and Boles (1994) adopted the name *neglectus* for this species, whereas Wolters (1975–1982) and Sibley and Monroe (1990) used *giganteus*. Christidis and Boles (1994) argued that even if *giganteus* were found to be applicable to the Beach Stone-curlew, the name has not been used for more than 50 years and can be considered an unused senior synonym. Under provisions of the present edition of the Code, however, it could be argued that this name still stands as it has been used in the past 50 years (ICZN; Article 23).

A completely different interpretation was presented by Schodde and Mason (1981) and Hume (1996), who argued that if the Beach Stone-curlew was kept in *Esacus* then the name *magnirostris* Viellot, 1818, was still applicable to this species. Dickinson (2003) provisionally followed Hume (1996), but considered that an application to the ICZN was probably required to resolve this issue. Pending such an application, *magnriostris* is used here as the specific epithet for this species.

Mayr (1938) suggested that *Esacus neglectus* and *E. recurvirostris* (Great Thick-knee; southern Asia) were best treated as conspecific – an action adopted by Deignan (1945) and supported by Mayr (1949). Nevertheless, most subsequent authors have treated the two as separate species (e.g. Peters 1934; Condon 1975; Hayman *et al.* 1986; Sibley and Monroe 1990; Marchant and Higgins 1983; Christidis and Boles 1994; Hume 1996; Dickinson 2003; Rasmussen and Anderton 2005), and this is maintained here. Although 'stone-curlew' is used for the Australian taxa, many non-Australian references prefer 'thick-knee' (e.g. Hayman *et al.*1986; Sibley and Monroe 1990; Hockey 1996).

Apart from the species name change for the Beach Stone-curlew, no other inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Burhinus grallarius	Bush Stone-curlew
Esacus magnirostris	Beach Stone-curlew

Family Haematopodidae

The poorly resolved systematics of the Australian and New Zealand oystercatchers (*Haematopus*), with their complex taxonomic and nomenclatural history, were reviewed by Baker (1975, 1977). Peters (1934) treated Australasian *longirostris* (Australian Pied Oystercatcher) and the New Zealand forms *finschi* (South Island Pied Oystercatcher), *chathamensis* (Chatham Oystercatcher) and *unicolor* (Variable Oystercatcher), together with other forms from Africa and the New World, as subspecies of *H. ostralegus* (Eurasian Oystercatcher). Although Vaurie (1965) suggested that *H. ostralegus* referred only to Eurasian forms, Condon (1975) followed Peters (1934). Oliver (1955) recognised *H. unicolor* and *H. longirostris* as species, but included *chathamensis* as a subspecies of the latter and retained *finschi* as a subspecies of *H. ostralegus*. Kinsky (1970) largely followed Oliver (1955), but separated *H. chathamensis* as a separate species. Based on multivariate analyses of several external morphological characters, Baker (1975, 1977) tentatively supported the treatment of Kinsky (1970). Furthermore, Baker (1977) concluded that *H. longirostris* was closer to New World forms than to Eurasian *H. ostralegus* and that *finschi* was aligned with the latter.

McKean (1978) argued that on biogeographical grounds, it made little sense to suggest that New Zealand *finschi* was an outlier of Eurasian *H. ostralegus* if Australasian *H. longirostris* was treated as a separate species. This scenario implied that *H. ostralegus* colonised New Zealand across the Indo-Malay distributional gap, apparently bypassing Australia and New Guinea. Cramp and Simmons (1983) restricted *H. ostralegus* to Eurasian forms, but suggested that *finschi* could prove to be conspecific with it.

Although most authors have accepted *H. longirostris*, *H. chathamensis* and *H. unicolor* as separate species, they differ regarding the treatment of *finschi*: Sibley and Monroe (1990), Marchant and Higgins (1993), Holdaway *et al.* (2001) and Dickinson (2003) treated it as a separate species; Hayman *et al.* (1986) included it as a subspecies of *longirostris*; and Hockey (1996) included it as a subspecies of *ostralegus*. It is here treated as a distinct species – a somewhat arbitrary decision given the conflicting views. Within the Australasian and New Zealand region the following species are recognised: *H. longirostris*, *H. finschi*, *H. chathamensis* and *H. unicolor*. Further work on the issue of the species status and affinities of these forms is still required.

Most authors (e.g. Peters 1934; Condon 1975; Hayman *et al.* 1986; Sibley and Monroe 1990; Marchant and Higgins 1993; Hockey 1996; Dickinson 2003) have divided Australian *Haematopus fuliginosus* (Sooty Oystercatcher) into two subspecies: *fuliginosus* (southern coasts of Australia) and *opthalmicus* (northern coasts of Australia). McKean (1978) contended that differences between the two in morphometrics and eye ring development were sufficient for *H. opthalmicus* to be recognised as a separate species (Spectacled Oystercatcher). Although this suggestion was not taken up by subsequent authors (e.g. Hayman *et al.* 1986; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Hockey 1996; Dickinson 2003), the issue merits further investigation.

Christidis and Boles (1994) noted that the identities of 'pied' oystercatchers from Norfolk Island (Schodde *et al.* 1983; Hermes *et al.* 1986) and Lord Howe Island (McKean and Hindwood 1965; Hay 1985) were yet to be determined. Hay (1985) suggested that records from Lord Howe Island were referrable to *finschi*, and Carter (1998) presented a strong case in favour of treating the sightings from both islands as this species. *Haematopus finschi* has been confirmed from Vanuatu (Hay 1984, 1985). Sightings of this species from north-eastern New South Wales and south-eastern Queensland have been accepted by BARC (BARC 258, 282, 306, 312, 397; Carter 1999b; Totterman *et al.* 1999; Straw 1999). Consequently, the inclusion of this species on the Australian Bird Species List can be confirmed. The mainland record and those from Vanuatu strengthen the possibility that Norfolk and Lord Howe Island records belong to this species.

Haematopus finschi	South Island Pied Oystercatcher^{V}
Haematopus longirostris	Australian Pied Oystercatcher
Haematopus fuliginosus	Sooty Oystercatcher

Family Recurvirostridae

The Recurvirostridae (stilts and avocets) comprise three genera, all of which are represented in Australia: *Himantopus himantopus* (Black-winged Stilt), *Cladorhynchus leucocephalus* (Banded Stilt) and *Recurvirostra novaehollandiae* (Red-necked Avocet). The taxonomic relationships among the three genera are unsettled. Chu's (1995) phylogenetic analysis of Strauch's (1978) osteological data identified *Himantopus* as the sister lineage to *Cladorhynchus* and *Recurvirostra*. The DNA–DNA hybridisation data of Sibley and Ahlquist (1990) could not resolve relationships among them, whereas protein allozyme data (Christian *et al.* 1992a) placed *Cladorhynchus* as the sister lineage to *Himantopus* and *Recurvirostra*. Olson and Feduccia (1980b) identified aspects of the appendicular myology that separated *Cladorhynchus* from both *Himantopus* and *Recurvirostra*, which is consistent with the protein allozyme data (Christian *et al.* 1992a). Christidis and Boles (1994), together with most other authors (e.g. Condon 1975; Sibley and Monroe 1990; Marchant and Higgins 1993; Pierce 1996), followed the generic sequence of Peters (1934); however, in order to be consistent with both the morphological and protein allozyme data, the sequence *Himantopus–Recurvirostra–Cladorhynchus* is adopted because it is consistent with either

Himantopus and *Recurvirostra* as sister taxa (e.g. Olson and Feduccia 1980b; Christian *et al*. 1992a) or *Recurvirostra* and *Cladorhynchus* as sister taxa (e.g. Chu 1995).

Peters (1934) recognised only a single species of stilt in the genus *Himantopus*. Mayr and Short (1970) tentatively accepted eight species, and regarded them as comprising a superspecies. Most subsequent authors (e.g. Condon 1975; Cramp and Simmons 1983; Pierce 1984, 1996; Hayman *et al*. 1985; Marchant and Higgins 1993; Christidis and Boles 1994; Inskipp *et al*. 1996) have maintained two species: *H. himantopus* (Black-winged Stilt) in Africa, Europe, Asia, Australasia and the New World, and *H. novaezelandiae* (Black Stilt) in New Zealand. Within *H. himantopus*, five subspecies are generally recognised (e.g. Cramp and Simmons 1983; Marchant and Higgins 1993; Pierce 1996; Dickinson 2003): *himantopus* (Africa, Europe, Asia), *leucocephalus* (Java through Australasia), *knudseni* (Hawaii), *mexicanus* (North, Central and northern South America) and *melanurus* (southern South America). Mayr and Short (1970) suggested that each was best treated as a species, as did White and Bruce (1986). Mayr and Short (1970) also suggested that *meridionalis* from southern Africa and *ceylonensis* from Sri Lanka be recognised as species; however, these forms had not even been recognised as subspecies by most other authors and were not accepted by Bock and Farrand (1980). Instead, the last authors recognised *himantopus* (which included *ceylonensis* and *meridionalis*), *leucocephalus*, *mexicanus* (which included *melanurus*) and *knudseni* as species, along with *novaezelandiae*. Sibley and Monroe (1990) differed from Bock and Farrand (1980) by treating *melanurus* as a separate species and including *knudseni* in *mexicanus*. Rogers (1993b) concluded that acceptance of the five forms as species was inconsistent with the level of geographical variation. Nevertheless, Cramp and Simmons (1983) commented that *leucocephalus* and the *mexicanus–knudseni–melanurus* group were similarly diverged from *himantopus*, while Hayman *et al*. (1986) suggested that these three regional groups could be recognised as separate species: *H. himantopus*, *H. mexicanus* and *H. leucocephalus*. This suggestion merits further investigation and such a treatment was adopted by AOU (1998).

Dickinson (2003) agreed with Pierce (1996) in regarding the alternative subspecific arrangements to be unsatisfactory. Rasmussen and Anderton (2005) noted that differences in morphology and vocalisations added support to recognising *leucocephalus* as a species separate from *himantopus*, while mentioning evidence of introgression between these taxa in western Indonesia.

Until there is further elaboration on these differences, Australian birds are regarded here as part of the wide ranging *H. himantopus* (Black-winged Stilt). The subspecific identity of birds from Christmas and Cocos (Keeling) Islands has not been confirmed.

Himantopus himantopus	Black-winged Stilt
Recurvirostra novaehollandiae	Red-necked Avocet
Cladorhynchus leucocephalus	Banded Stilt

Family Charadriidae

Peters (1934) divided the Charadriidae into two subfamilies, Vanellinae (lapwings) and Charadriinae (plovers, dotterels) and this has been followed by most authors. Analysis of the plumages of downy young (Jehl 1968a) also supported this division. The position of *Pluvianellus socialis* (Magellanic Plover; southern South America) is unsettled; it has been placed in the Charadriinae, or segregated in its own subfamily or family (Jehl 1968a, 1975; Strauch 1978, Piersma 1996b). Recent information indicates a closer relationship with the sheathbills (Chionidae). (Paton *et al*. 2003; Paton and Baker 2006), and Dickinson (2003) included it as a subfamily in that family.

The available protein allozyme data (Christian *et al*. 1992b) and DNA sequences of the mitochondrial cytochrome-*b* gene

(Joseph *et al.* 1999) do not support monophyly of the Charadriinae. In both studies the Vanellinae appeared to be embedded within the Charadriinae, but it should be noted that coverage of taxa was limited in these two studies. The protein allozyme data (Christian *et al.* 1992b) placed *Pluvialis* (golden plovers and Grey Plover) as the sister lineage to *Charadrius* (plovers and dotterels) and *Vanellus* (lapwings). A similar position was found by Ericson *et al.* (2003a) using nuclear DNA sequences. Baker *et al.* (2007) also found *Pluvialis* sat apart from the other members of the Charadriidae. *Pluvialis* was not included in the study of Joseph *et al.* (1999). The results from Joseph *et al.* (1999) also implied that *Charadrius* itself was paraphyletic. Unfortunately, the taxon representation was small, so no broad statement can be made about subdivisions among species within *Charadrius sensu lato*.

Peters (1934) recognised the monotypic genus *Squatarola* for the Grey Plover (*squatarola*), but Bock (1958) subsequently included it in *Pluvialis* – an action that has received general acceptance and is followed here. Bock (1958) also included the New Zealand Dotterel (*obscurus*) in *Pluvialis,* but most authors since have included it in *Charadrius* (e.g. Hayman *et al.* 1986; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Wiersma 1996; Dickinson 2003).

Several monotypic genera of plovers and dotterels recognised by Peters (1934) were merged with *Charadrius* by Bock (1958). Included among these were the Australian taxa *Elseyornis melanops* (Black-fronted Dotterel) and *Erythrogonys cinctus* (Red-kneed Dotterel). Condon (1975) and Sibley and Monroe (1990) accepted the first, but not the second, action, whereas Hayman *et al.* (1986) accepted both. The protein allozyme studies of Christian *et al.* (1992b) demonstrated that *cinctus* was not part of *Charadrius,* but was more closely allied to *Vanellus* and should be retained in the monotypic *Erythrogonys*. This was followed by most subsequent authors (e.g. Marchant and Higgins 1993; Christidis and Boles 1994; Wiersma 1996).

Schodde (1982) placed *melanops* in *Elseyornis*, citing Fjeldså (1977) as justification, but the latter gave no reasons for the use of this genus. Nevertheless, most recent authors have recognised *Elseyornis* (e.g. Marchant and Higgins 1993; Christidis and Boles 1994; Piersma 1996b; *contra* Johnstone 2001 and Johnstone and Storr 1998). In Christian *et al.* (1992b), *Elseyornis* was incorrectly spelt as *Elsyornis*.

Based on their protein allozyme data, Christian *et al.* (1992b) tentatively placed *Charadrius rubricollis* (Hooded Plover) into *Thinornis*. This action was accepted by Marchant and Higgins (1983) and Christidis and Boles (1994), but not by Piersma (1996b) or Johnstone (2001). Christian *et al.* (1992b) identified a distant, but sister, relationship between *rubricollis* and *Elseyornis melanops*, but they did not include *Charadrius* (*Thinornis*) *novaeseelandiae* (Shore Plover; New Zealand) – the type species of *Thinornis* – in their study. Nevertheless, in considering ecological, plumage and behavioural similarities, they argued for inclusion of both *rubricollis* and *novaeseelandiae* in *Thinornis*. Joseph *et al.* (1999) also identified a sister relationship between *rubricollis* and *Elseyornis melanops* relative to 11 species currently placed in *Charadrius*, but again these authors had no data on *novaeseelandiae*. Clearly the affinities of these three taxa are far from resolved, but what is clear is that the continued incision of *melanops* and *rubricollis* in *Charadrius* is not tenable. Piersma (1996b) and Holdaway *et al.* (2001) retained *novaeseelandiae* in *Charadrius*, and, in their supertree, Thomas *et al.* (2004b) placed it in a clade with *Charadrius veredus* (Oriental Plover) and *Peltohyas australis* (Inland Plover). Given the available evidence, Christidis and Boles (1994) are followed in recognising the genus *Thinornis* for *rubricollis* and *novaeseelandiae*. Dickinson (2003) remarked that it was likely that *Thinornis* and *Elseyornis* were close to the vanellines. In the analysis of Baker *et al.* (2007), these were two genera grouped together as the sister lineage to *Charadriius*, well separated from *Vanellus*.

Both *rubricollis* and *cucullatus* have been in use at various times as species name for the Hooded Plover (summarised in McAllan and Christidis 1998). In order to stabilise current usage of *rubricollis* (e.g. Condon 1975; Hayman *et al*. 1986; Sibley and Monroe; Marchant and Higgins 1993; Christidis and Boles 1994; Wiersma 1996; Dickinson 2003), McAllan and Christidis (1998) designated a neotype, although Olson (1998b) regarded this as invalid. Olson (1998b) designated the original William Ellis drawings as the lectotype of *Charadrius rubricollis*. This results in that name becoming a junior subjective synonym of *Tringa lobata* (= *Phalaropus lobatus*, Red-necked Phalarope) and establishes *cucullatus* as the next available name for the Hooded Plover. It is likely that resolution of this problem will require action by the International Committee on Zoological Nomenclature. Until such time, common usage is followed here by retaining *rubricollis*.

Both protein allozyme (Christian *et al*. 1992b) and mitochondrial DNA sequencing (Joseph *et al*. 1999) demonstrated conclusively that *Peltohyas australis* was part of *Charadrius* and was most closely related to *C. veredus*. Strauch's (1978) osteological analysis also aligned it with *Charadrius*. In common with other species of *Charadrius*, *australis* has both breeding and non-breeding plumages (Maclean 1976). The inclusion of *australis* in *Charadrius* was accepted by Marchant and Higgins (1993) and Christidis and Boles (1994). Piersma (1996b), while acknowledging that biochemical and morphological data supported its inclusion in *Charadrius*, continued to recognise *Peltohyas* for this species, as did Johnstone (2001) and Johnstone and Storr (1998). In the study of Baker *et al*. (2007), *Peltohyas* formed a small clade with *Erythogonys* and *Anarhynchus frontalis* (Wrybill; New Zealand) that was the sister clade to *Vanellus*. This group of *Vanellus* and three Australasian taxa was the sister taxon to the other plovers (except *Pluvialis*).

It is clear from the preceding sections that circumscription of the genus *Charadrius* and its allies is far from resolved. Joseph *et al*. (1999) identified two assemblages among the taxa examined: (1) *modestus* (Rufous-chested Plover), *melanops*, *rubricollis*, *vociferous* (Killdeer) and *semipalmatus* (Semipalmated Plover), and (2) *collaris* (Collared Plover), *montanus* (Mountain Plover), *ruficapillus* (Red-capped Dotterel), *alexandrinus* (Kentish Plover), *falklandicus* (Two-banded Plover), *bicinctus* (Double-banded Plover), *veredus* and *australis*. In another analysis that included representatives of *Vanellus* and *Oreopholus*, these two assemblages were not sister lineages. It is possible that several additional genera may need to be recognised. The genus *Charadrius* was based on *hiaticula* (Ringed Plover) and so its affinities need to be established as a first step in revising this group. Apart from recognising *Thinornis*, here we follow the circumscription of Sibley and Monroe (1990) for *Charadrius*, which included *obscurus* (New Zealand Dotterel), but excluded *morinellus* (Eurasian Dotterel) and *frontalis*, which was placed in the monotypic genera *Eudromius* and *Anarhynchus*, respectively. This treatment renders *Charadrius* as a paraphyletic group, although without further data, it is not possible to solve this anomaly without creating additional problems.

Bock (1958) treated *C. asiaticus* (Caspian Plover) as a subspecies of *C. veredus,* but this has not been followed by subsequent authors (e.g. Hayman *et al*. 1986; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Piersma 1996b).

Peters (1934) and others (e.g. Condon 1975, Cramp and Simmons 1983) had treated *fulva* as a subspecies of *P. dominicus*. Connors (1983), Connors *et al*. (1993) and Byrkjedal and Thompson (1998) provided detailed morphometric, behavioural, vocalisation and breeding data to support the recognition of *Pluvialis fulva* (Pacific Golden Plover), *P. apricaria* (Eurasian Golden Plover) and *P. dominicus* (American Golden Plover) as separate species. The correct name for the last is *P. dominicus*, not *P. dominica* (AOU 1995).

Recognition of three species has been widely accepted (e.g. Hayman *et al.* 1986; Knox 1987; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Wiersma 1996; Dickinson 2003) and is followed here.

Bock's (1958) action of placing all lapwings in a single genus *Vanellus* has received general acceptance (Condon 1975; Hayman *et al.* 1986; Sibley and Monroe 1990; Piersma 1996b), although Wolters (1975–1982) continued to recognise several genera. The lapwings form a clade united by such characters as osteology (Strauch 1978), behaviour (Ward 1992) and chemistry of the uropygial gland wax (Hoerschelmann and Jacob 1992). Whether *Vanellus* should again be split into several genera awaits further study.

Christidis and Boles (1994) included the following species as vagrants: *Charadrius hiaticula* (Ringed Plover; Condon 1975; Marchant and Higgins 1993; BARC 330), *C. dubius* (Little Ringed Plover; Patterson 1991; Marchant and Higgins 1993); *C. alexandrinus* (Kentish Plover; RAC 170); *C. asiaticus* (Gibson-Hill 1949; Condon 1975; Marchant and Higgins 1993; BARC 218). Christidis and Boles (1994) placed both *Pluvialis dominicus* and *P. apricaria* on the supplementary list because reports from Australia had not been accepted at that time (see Marchant and Higgins 1993). A subsequent record of *P. dominicus* from north-eastern New South Wales has been reviewed by BARC and considered valid (Patterson 1996; BARC 189; see also Dooley 2006d). An individual *Vanellus cinereus* (Grey-headed Lapwing), viewed by numerous observers and widely photographed in north central New South Wales, was accepted (BARC 492).

Additional work on relationships within the Charadriidae (*sensu lato*) is clearly needed to resolve generic circumscriptions and relationships.

Pluvialis fulva	Pacific Golden Plover
Pluvialis dominicus	American Golden Plover^{V}
Pluvialis apricaria	Eurasian Golden Plover^{S}
Pluvialis squatarola	Grey Plover
Charadrius hiaticula	Ringed Plover^{V}
Charadrius dubius	Little Ringed Plover^{V}
Charadrius alexandrinus	Kentish Plover^{V}
Charadrius ruficapillus	Red-capped Plover
Charadrius bicinctus	Double-banded Plover
Charadrius mongolus	Lesser Sand Plover
Charadrius leschenaultii	Greater Sand Plover
Charadrius asiaticus	Caspian Plover$^{V,CK/V}$
Charadrius veredus	Oriental Plover
Charadrius australis	Inland Dotterel
Elseyornis melanops	Black-fronted Dotterel
Thinornis rubricollis	Hooded Plover
Erythrogonys cinctus	Red-kneed Dotterel
Vanellus tricolor	Banded Lapwing
Vanellus miles	Masked Lapwing
Vanellus cinereus	Grey-headed Lapwing^{V}

Family Pedionomidae

No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994) in which a single species is recognised, *Pedionomus torquatus* (Plains-wanderer).

Pedionomus torquatus	Plains-wanderer

Family Jacanidae

Whittingham *et al.* (2000) examined relationships within the Jacanidae (jacanas) using DNA sequences (705 base pairs) of the mitochondrial cytochrome-*b* and ND5 genes. Two assemblages were identified: (1) *Irediparra* (Australasia), *Microparra* (Africa) , *Metopidius* (Asia) and *Actophilornis* (Africa); and (2) *Hydrophasaianus* (Asia) and *Jacana* (South and Central America). These two groups were consistent with those identified by Strauch (1978) based on a character compatibility analysis of largely osteological characters, and were recovered by Thomas *et al.* (2004b) in their supertree. Strauch (1976) had recommended treating the two lineages as genera *Actophilornis* (including *Irediparra*, *Microparra* and *Metopidius*) and *Jacana* (including *Hydrophasianus*). Johnstone (2001) and

Johnstone and Storr (1998) combined *Irediparra* with *Metopidius*, but most authors have continued to recognise six genera (e.g. Sibley and Monroe 1990; Jenni 1996; Dickinson 2003). The DNA distances recorded between the six genera by Whittingham *et al.* (2000) were consistent with separate recognition of each. Consequently, no taxonomic changes have been made to the treatment in Christidis and Boles (1994).

In Australia the two lineages are represented by resident *Irediparra gallinacea* (Comb-crested Jacana) and vagrant *Hydrophasianus chirurgus* (Pheasant-tailed Jacana; BARC 004; Marchant and Higgins 1993).

Irediparra gallinacea	Comb-crested Jacana
Hydrophasianus chirurgus	Pheasant-tailed Jacana^{V}

Family Rostratulidae

The Rostratulidae (painted snipes) is generally considered to comprise two species: *Rostratula benghalensis* (Greater Painted Snipe) from Africa, Asia and Australia, and *Nycticryphes semicollaris* (South American Painted Snipe). Whether the two genera should be combined is still open to debate, but current practice has been to keep them separate (e.g. Sibley and Monroe 1990; Kirwan 1996; Dickinson 2003).

Peters (1934) treated Australian populations of painted snipe (*australis*) as the same species as African and Asian populations (*benghalensis*), which has been accepted by most subsequent authors (e.g. Condon 1975; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Kirwan 1996; Dickinson 2003). Based on the plumage comparisons of the two forms undertaken by Rogers (1993a), Christidis and Boles (1994) suggested that further work was required to ascertain whether *australis* merited full specific status. Conversely, Kirwan (1996) stated that the two forms exhibited very few morphological or behavioural differences. Lane and Rogers (2000) made a detailed assessment of morphometric and plumage characters distinguishing *Rostratula benghalensis benghalensis* and *R. b. australis*. They concluded that there was sufficient morphological differentiation to warrant specific separation of the two forms. Moreover, Lane and Rogers (2002) suggested that mating calls between the two also differed, but the evidence for this was circumstantial. Baker *et al.* (in press) sequenced five mitochondrial genes and compared populations of painted snipes from Africa, south-east Asia and Australia. They found that African and Asia birds exhibited a 2% difference in these sequences, whereas Australian birds differed from these extralimital populations by 10%. In accordance with these findings, *R. australis* (Australian Painted Snipe) is recognised in this list.

Rostratula australis	Australian Painted Snipe

Family Scolopacidae

The Scolopacidae are often divided into six subfamilies (Jehl 1968a; Piersma 1996a): Scolopacinae (woodcocks), Gallinagininae (snipe), Arenariinae (turnstones), Calidridinae (sandpipers), Tringinae (godwits, curlews, shanks and Polynesian sandpipers) and Phalaropodinae (phalaropes). (Gallinagininae is the correct spelling – see Bock 1994 – not Gallinagoninae as is sometimes used, e.g. Jehl 1968a.) The Tringinae are further divided into three tribes: Numeniini (godwits and curlews); Tringini (shanks); and Prosoboniini (Polynesian sandpipers). The composition of, and relationships between, these subfamilies are areas requiring further investigation.

The New Zealand snipe *Coenocorypha* are sometimes aligned with *Gallinago* (Gallinagininae) (e.g. Jehl 1996a; Sibley and Monroe 1990; Piersma 1996a), although based on a consideration of osteological data, Lowe (1915) aligned *Coenocorypha* with *Scolopax* (Scolopacinae). *Limnodromus* (dowitchers) has often been included in the Gallinagininae (e.g. Jehl 1968a; Piersma 1996a), but morphological analyses of Strauch (1978) allied this genus more closely with the Calidrinae.

Protein allozyme (Dittmann *et al.* 1989) and mitochondrial DNA restriction enzyme (Dittmann and Zink 1991) analyses examining relationships between representatives of *Phalaropus* (phalaropes), *Calidris* (sandpipers), *Tringa* (shanks) and *Limnodromus* showed a link between *Limnodromus* and *Calidris*. Analyses based on osteological characters (Strauch 1978; Chu 1995) also suggested a link between these two genera. The protein allozyme study of Baker and Strauch (1988), however, which included *Limnodromus griseus* (Short-billed Dowitcher), several species of *Calidris*, *Xenus cinereus* (Terek Sandpiper) and *Catoptrophorus semipalmatus* (Willet), identified *Limnodromus* as the first genus to diverge. The DNA–DNA hybridisation data of Sibley and Ahlquist (1990) distinguished two assemblages among the scolopacid taxa examined: (1) *Scolopax* and *Gallinago* and (2) *Numenius* (curlews), *Limosa* (godwits), *Limnodromus*, *Phalaropus*, *Tringa*, *Arenaria* (turnstones), *Micropalma himantopus* (Stilt Sandpiper), *Calidris* and *Tryngites subruficollis* (Buff-breasted Sandpiper). The available data do not support the placement of *Limnodromus* in the Gallinagininae.

Monophyly of the Tringinae is also inconsistent with current data. Both DNA–DNA hybridisation (Sibley and Ahlquist 1990) and protein allozyme (Christian *et al.* 1992a) data aligned *Tringa* closer to *Calidris* than to *Numenius* and *Limosa*. A sister relationship between the last two genera was strongly supported by the protein allozyme data of Christian *et al.* (1992a), but not by the osteological analyses of Strauch (1978) and Chu (1995). Dittmann *et al.* (1989) and Dittmann and Zink (1991) concluded that that phalaropes did not merit separation as a subfamily. In contrast, Livezey and Zusi (2007) placed them in their own family, as sister taxon to the Scolopacidae. A close sister relationship between *Arenaria* and the calidridine assemblage was identified by Sibley and Ahlquist (1990).

The available molecular data do not support monophyly of the six subfamilies as circumscribed by Jehl (1968a) and Piersma (1996a). Hoerschelmann and Jacob (1992) reported that the uropygial gland secretions of *Scolopax* and *Gallinago* differ significantly in their chemistry from that of other Scolopacidae. Although it is debatable whether relationships within the Scolopacidae are understood sufficiently well to recognise subfamilies and tribes, two assemblages seem to be apparent and could be recognised as subfamilies: (1) Scolopacinae (*Scolopax*, *Coenocorypha*, *Gallinago* and *Lymnocryptes*) and (2) Tringinae (remaining genera, including *Limnodromus*). This division differs from the treatment in AOU (1998), in which the Phalaropodinae were recognised as a subfamily and the Tringinae were included in the Scolopacinae. Recognition of the Scolopacinae and Tringinae as subfamilies conflicts with Chu's (1995) parsimony analysis of the osteological data of Strauch (1978). According to Chu (1995), the tringines are aligned with *Scolopax*, *Gallinago* and the Jacanidae. It is generally accepted that the Jacanidae are a separate family from the Scolopacidae, which suggests caution should be exercised in accepting the results of this analysis (see general discussion above). Although recognition of tribes within the two subfamilies is probably warranted, there is still a lack of clear resolution of the affinities among various genera.

The sequence of genera and species varies considerably between works (e.g. Cramp 1985; Hayman *et al.* 1986; Sibley and Monroe 1990; van Gils and Wiersma 1996). Christidis and Boles (1994) followed Sibley and Monroe (1990). There are recent molecular studies on relationships in the calidridine and tringine assemblages (discussed below), but few substantive data to favour any one sequence over another among groups. The sequence of genera and species of Christidis and Boles (1994) is retained, other than where the more recent findings cited above require modifications.

There has not been a generally accepted view on whether *Actitis* (Common Sandpiper, *A. hypoleucos*; Spotted Sandpiper, *A. macularius*), *Heteroscelus* (*T. brevipes*, Grey-tailed Tattler; *T. incana*, Wandering Tattler) and

Xenus (*X. cinereus*, Terek Sandpiper) should be recognised as generically distinct from *Tringa* (shanks). (The correct specific epithet for the Terek Sandpiper is *cinereus*, as explained by Monroe 1989, *contra* Condon 1975, who used *terek*.) Condon (1975) placed all species in *Tringa*, as did Johnsgard (1981), Sibley and Monroe (1990) and Johnstone and Storr (1998). Other major regional lists and monographs, however, have maintained these as separate (e.g. AOU 1983, 1998; Cramp and Simmons 1983; Hayman *et al.* 1986; White and Bruce 1986; Christidis and Boles 1994; van Gils and Wiersma 1996; Dickinson 2003). Jehl (1968a) judged that the downy young plumage patterns of *Xenus* were intermediate between those of *Tringa* and *Actitis*. Hoerschelmann and Jacob (1992) reported divergent uropygial gland secretion chemistry in *Actitis* relative to that in *Tringa* and *Calidris*. The protein allozyme data of Baker and Strauch (1988) embedded *Xenus* and *Catoptrophorus* within *Calidris*, although these authors did not examine representatives of *Tringa*. According to the osteological analyses of Strauch (1978), *Xenus* and *Actitis* were aligned with the calidridine assemblage, and *Heteroscelus* and *Catoptrophorus* with the tringines. The re-analysis by Chu (1995) of this data set, while providing less resolution, was still consistent with the findings of Strauch (1978).

Pereira and Baker (2005) examined relationships in *Tringa* (all species except *T. guttifer*, Nordmann's Greenshank) and related genera using both mitochondrial and nuclear DNA sequences. They found that *Xenus* and *Actitis* sat outside *Tringa* and warranted continued generic recognition. The two tattlers were embedded within *Tringa* (*sensu stricto*), thus requiring *Heteroscelus* to be merged with that genus. It was also evident that leg colour was not indicative of relationships among the shanks. These authors recovered *T. solitaria* (Solitary Sandpiper) as the first lineage to diverge, followed by *T. ochropus* (Green Sandpiper). Next was the pair of *T. brevipes* and *T. incana*. The remaining species formed two clades. In one, *T. erythropus* (Spotted Redshank) was the sister species to *T. nebularia* (Common Greenshank) and *T. melanoleuca* (Greater Yellowlegs). *Tringa glareola* (Wood Sandpiper) and *T. totanus* (Common Redshank) paired with *T. stagnatilis* (Marsh Sandpiper) and these, in turn, were allied to *T. flavipes* (Lesser Yellowlegs) and *T.* (*Catoptrophorus*) *semipalmatus*.

Borowik (1996) examined phylogenetic relationships in *Calidris* and related genera using 1,645 base pairs of mitochondrial DNA sequence data from the cytochrome-*b* and ATPase 6 genes. Although the analyses have not yet been published in the primary literature, the resulting topology was published in Borowick and McLennan (1999) and its taxonomic significance is discussed here. According to the DNA-based topology, which had *Arenaria* as the designated outgroup, the genus *Calidris* as currently defined is paraphyletic. *Calidris canutus* (Red Knot) is the sister lineage of *Aphriza virgata* (Surfbird) and these, together with *C. tenuirostris* (Great Knot) form a distinct clade. Based on comparisons of external morphology and breeding biology, Jehl (1968b) had earlier argued for a close relationship between *Aphriza* and the knots (*C. tenuirostris* in particular). According to the DNA-based tree, the knots and *Aphriza* are part of a larger assemblage that included *Calidris acuminata* (Sharp-tailed Sandpiper), *Limicola falcinellus* (Broad-billed Sandpiper) and *Philomachus pugnax* (Ruff) – the first two as sister taxa. The remaining species of *Calidris*, along with *Micropalama* and *Tryngites*, form a second assemblage. Within it, *C. ferruginea* (Curlew Sandpiper) is the sister species to the other taxa. Other lineages identified were *C. subminuta* (Long-toed Stint) and *C. ruficollis* (Red-necked Stint) as sister taxa; *Micropalama himantopus*; *C. ptilocnemis* (Rock Sandpiper), *C. maritima* (Purple Sandpiper) and *C. alpina* (Dunlin); *Tryngites subruficollis*; *C. pusilla* (Semipalmated Sandpiper), *C. mauri* (Western Sandpiper) and *C. melanotos* (Pectoral Sandpiper); *C. bairdii* (Baird's Sandpiper), *C. alba* (Sanderling), *C. minuta* (Little Stint), *C. minutilla*

(Least Sandpiper) and *C. fuscicollis* (White-rumped Sandpiper). Members of the calidridine assemblage not included in the DNA study were *C. temminckii* (Temminck's Stint), *Limicola falcinellus* (Broad-billed Sandpiper) and *Eurynorhynchus pygmeus* (Spoon-billed Sandpiper).

In agreement with the DNA sequence data, the protein allozyme studies of Baker *et al.* (1985) and Baker and Strauch (1988) identified *C. canutus* and *C. ferruginea* in a basal position among the limited number of species of *Calidris* that were examined.

These studies demonstrate that the current circumscription of *Calidris* is a paraphyletic construct. Previous treatments (e.g. Peters 1934) split the genus into several smaller ones and some of these groups correspond to the clades identified by the DNA sequence data. The recognition of several smaller genera may not be warranted because it may be preferable to combine one or more of currently recognised genera, such as *Aphriza*, *Micropalama*, *Tryngites*, *Limicola* and *Philomachus*, with *Calidris*. Dickinson (2003) retained *Aphriza,* but commented that placement in *Calidris* may be more appropriate. AOU (1998) merged *Micropalama* with *Calidris*.

Calidris paramelanotos (Cox's Sandpiper) – described by Parker (1982) as a new species, but regarded as a hybrid by Cox (1989) – is no longer recognised as a species and so is removed from the supplementary list. A combined analysis of mitochondrial DNA sequence, protein allozyme and morphological data (Davies 1992; Christidis *et al.* 1996) demonstrated that it was a hybrid involving a cross between a female of *C. ferruginea* and probably a male of *C. melanotos*.

Although Peters (1934) considered *Limnodromus scolopaceus* (Long-billed Dowitcher) to be a subspecies of *L. griseus*, most authors have treated the two as separate species (e.g. Morony *et al.* 1975; Bock and Farrand 1980; Hayman *et al.* 1986; Sibley and Monroe 1990; van Gils and Wiersma 1996). Protein allozyme data (Avise and Zink 1988) confirmed this latter treatment by revealing high levels of genetic differentiation between *scolopaceus* and *griseus*.

Dittmann *et al.* (1989) concluded that *Phalaropus* was paraphyletic, with *tricolor* (Wilson's Phalarope) best placed in a monotypic genus *Steganopus* and the genus *Phalaropus* should be restricted to *lobatus* (Red-necked Phalarope) and *fulicarius* (Grey Phalarope). The mitochondrial DNA restriction enzyme study of Dittmann and Zink (1991) demonstrated that the phalaropes form a monophyletic group, with *tricolor* being the most basal species. Based on the molecular data, Sibley and Monroe (1990) and van Gils and Wiersma (1996) separated *tricolor* into *Steganopus* while AOU (1998), Sangster *et al.* (1999) and Dickinson (2003) kept it in *Phalaropus*. Christidis and Boles (1994) recognised *Steganopus* on the basis of the molecular data and because it can be distinguished from *Phalaropus* by its osteology (Campbell 1979). While it is acknowledged that the issue is far from resolved, *Steganopus* is retained in this list. Parkes (1982) argued that the correct spelling was *Phalaropus fulicaria* and not *P. fulicarius*. This conclusion was followed by Sibley and Monroe (1990) and Christidis and Boles (1994). David and Gosselin (2000) showed that *fulicarius* is the correct spelling of the specific epithet. Although van Gils and Wiersma (1996) stated that *Steganopus* is 'apparently quite close to *Tringa*', the protein allozyme data (Dittmann *et al.* 1989) align it closest to *Calidris canutus* and the mitochondrial DNA restriction enzyme data (Dittmann and Zink 1991) place it with *Phalaropu*s. Here the phalaropes are placed last in sequence in keeping with current convention (e.g. Sibley and Monroe; Christidis and Boles 1994; van Gils and Wiersma 1996; Dickinson 2003) rather than reflecting any phylogenetic data.

Species now included in the Australian Species List that did not appear in Christidis and Boles (1994) are the newly accepted records of vagrants: *Tringa ochropus* (BARC 239), *T. guttifer* (BARC 519) (both formerly supplementary list) and *Limnodromus griseus* (BARC 195). *Numenius tahitiensis* was included on the supplementary list by Christidis and Boles (1994) on the basis of reports from Norfolk Island and north-east Queensland that have not been assessed by a rarities committee (see Higgins and Davies 1996); it is retained on that list.

Limnodromus scolopaceus (Campbell and Minton 1995) has been removed from the supplementary list as this individual subsequently proved to be a Short-billed Dowitcher. Gibson-Hill (1949) reviewed apparent records of *Gallinago gallinago* from the Cocos (Keeling) Islands and advised that the records be discarded: this species is not included on the supplementary list. Reports of *Calidris mauri*, *C. temminckii*, *Tringa solitaria* (Solitary Sandpiper) and *Numenius arquata* (Eurasian Curlew) have been reviewed by RAC or BARC, but none has yet been accepted. These species are omitted from the supplementary list.

Gallinago hardwickii	Latham's Snipe
Gallinago stenura	Pin-tailed Snipe^{V}
Gallinago megala	Swinhoe's Snipe
Limosa limosa	Black-tailed Godwit
Limosa haemastica	Hudsonian Godwit^{V}
Limosa lapponica	Bar-tailed Godwit
Numenius minutus	Little Curlew
Numenius phaeopus	Whimbrel
Numenius tahitiensis	Bristle-thighed Curlew^{S}
Numenius madagascariensis	Eastern Curlew
Bartramia longicauda	Upland Sandpiper^{V}
Xenus cinereus	Terek Sandpiper
Actitis hypoleucos	Common Sandpiper
Tringa ochropus	Green Sandpiper^{V}
Tringa brevipes	Grey-tailed Tattler
Tringa incana	Wandering Tattler
Tringa erythropus	Spotted Redshank^{V}
Tringa guttifer	Nordmann's Greenshank^{V}
Tringa nebularia	Common Greenshank
Tringa flavipes	Lesser Yellowlegs^{V}
Tringa stagnatilis	Marsh Sandpiper
Tringa totanus	Common Redshank
Tringa glareola	Wood Sandpiper
Arenaria interpres	Ruddy Turnstone
Limnodromus semipalmatus	Asian Dowitcher
Limnodromus griseus	Short-billed Dowitcher^{V}
Calidris tenuirostris	Great Knot
Calidris canutus	Red Knot
Calidris alba	Sanderling
Calidris minuta	Little Stint
Calidris ruficollis	Red-necked Stint
Calidris subminuta	Long-toed Stint
Calidris fuscicollis	White-rumped Sandpiper^{V}
Calidris bairdii	Baird's Sandpiper^{V}
Calidris melanotos	Pectoral Sandpiper
Calidris acuminata	Sharp-tailed Sandpiper
Calidris alpina	Dunlin^{V}
Calidris ferruginea	Curlew Sandpiper
Calidris himantopus	Stilt Sandpiper^{V}
Tryngites subruficollis	Buff-breasted Sandpiper^{V}
Limicola falcinellus	Broad-billed Sandpiper
Philomachus pugnax	Ruff
Steganopus tricolor	Wilson's Phalarope^{V}
Phalaropus lobatus	Red-necked Phalarope
Phalaropus fulicarius	Grey Phalarope^{V}

Family Turnicidae

Turnix is masculine (David and Gosselin 2002b) and endings of several specific epithets must change from those used in Christidis and Boles (1994). The sequence of species adopted here is that of Sibley and Monroe (1990) as it has wide acceptance (e.g. Debus 1996; Madge and McGowan 2002; Dickinson 2003), *contra* Christidis and Boles (1994), who followed Johnsgard (1991). No other taxonomic changes or inclusions have been made to the treatment in Christidis and Boles (1994).

Although Peters (1934) combined the two as one species, *Turnix sylvaticus* (Common Button-quail; southern Europe, Africa and southern Asia) and *T. maculosus* (Red-backed Button-quail; eastern Indonesia, New Guinea, Solomons and Australia) have been treated as separate by most subsequent authors (e.g. Mayr 1938; Condon 1975; White and Bruce 1986; Sibley and Monroe 1990; Johnsgard 1991; Christidis and Boles 1994; Debus 1996; Inskipp *et al.* 1996; Madge and McGowan 2002; Dickinson 2003). Sutter (1955) suggested that the two occurred sympatrically on Mindanao, Philippine Islands, and are therefore separate species. White and Bruce (1986) and Dickinson *et al.* (1991) doubted the validity of this. *Turnix maculosus* has also been associated closely with, or treated as conspecific with, *T. tanki* (Yellow-legged Button-quail; Asia) (Sutter 1955; Etchécopar and Hüe 1978; Johnsgard 1991). Nevertheless, most authors align *T. maculosus* with *T. sylvaticus* (e.g. Sibley and Monroe 1990; Debus 1996; Madge and McGowan 2002). The conventional treatment of recognising *T. maculosus* as a species is followed, while noting that the relationships within the complex are far from resolved.

Turnix olivii (Buff-breasted Button-quail) was treated as a subspecies of *T. castanota* (Chestnut-backed Button-quail) by Peters (1934) and Johnsgard (1991), but most other authors (e.g. Condon 1975; Sibley and Monroe 1990; Marchant and Higgins 1993; Christidis and Boles 1994; Debus 1996; Madge and McGowan 2002) have kept them as separate species and this practice is maintained here. Christidis and Boles (1994) discussed the correct spelling of *olivii*.

Macdonald (1971) argued that *T. olivii* was closer to *T. varius* (Painted Button-quail) than to *T. castanotus*. Furthermore, he suggested that the form of *T. varius* on New Caledonia (*novaecaledoniae*) could also be treated as separate species. Although this has not been followed by subsequent authors, the suggestion merits further investigation as *novaecaledoniae* is morphologically quite distinct (Debus 1996).

Johnsgard (1991) included *Turnix worcesteri* (Worcester's Button-quail; Philippines) and *T. everetti* (Sumba Button-quail; Lesser Sundas) in *T. pyrrhothorax* (Red-chested Button-quail; Australia), but presented no detailed evidence to support such a treatment. Peters (1934) recognised *T. worcesteri* as a species, but included *everetti* as a subspecies of *T. sylvaticus*. Mayr (1938) concluded that *T. everetti* had no obvious affinities with either *T. sylvaticus* or *T. maculosa* and that it was a distinct species with only a distant relationship to *T. pyrrhothorax*. White and Bruce (1986) suggested a close relationship between *T. everetti*, *T. pyrrhothorax* and *T. worcesteri*, but retained them as separate species, as have most other authors (e.g. Sibley and Monroe 1990; Christidis and Boles 1994; Debus 1996; Inskipp *et al.* 1996; Madge and McGowan 2002; Dickinson 2003).

Turnix maculosus	Red-backed Button-quail
Turnix melanogaster	Black-breasted Button-quail
Turnix castanotus	Chestnut-backed Button-quail
Turnix olivii	Buff-breasted Button-quail
Turnix varius	Painted Button-quail
Turnix pyrrhothorax	Red-chested Button-quail
Turnix velox	Little Button-quail

Family Glareolidae

Delacour (1947) regarded *Glareola maldivarum* (Oriental Pratincole) as a subspecies of *G. pratincola* (Collared Pratincole), but most authors have treated the two as separate species (e.g. Peters 1934; White and Bruce 1986; Sibley and Monroe 1990; Christidis and Boles 1994; Inskipp *et al.* 1996; Maclean 1996; Rasmussen and Anderton 2005).

No inclusions or taxonomic changes have been made to the treatment in Christidis and Boles (1994).

Glareola maldivarum	Oriental Pratincole
Stiltia isabella	Australian Pratincole

Family Stercorariidae

Within this group, two genera have conventionally been recognised (Peters 1934; Devillers 1977; Brooke 1978b; Sibley and Monroe 1990; Christidis and Boles 1994; Furness 1987, 1996; Olsen and Larsson 1997): *Stercorarius* (jaegers) and *Catharacta* (skuas). *Stercorarius* traditionally comprises three species (*pomarinus*, Pomarine Jaeger; *parasiticus*, Parasitic Jaeger; *longicaudus*, Long-tailed

Jaeger), while within *Catharacta* six forms have been recognised as either species or subspecies (reviewed in Furness 1987): *skua* (Great Skua), *antarctica* (Southern Skua), *lonnbergi* (Brown Skua), *hamiltoni* (Tristan Skua), *maccormicki* (South Polar Skua) and *chilensis* (Chilean Skua).

Three issues have stimulated considerable debate:

(1) whether *Catharacta* warrants generic distinction from *Stercorarius*
(2) what are the affinities of *pomarinus*?
(3) how many species should be recognised within *Catharacta*?

The first two issues are strongly interrelated. When two genera are recognised, *pomarinus* is placed in *Stercorarius* (Peters 1934; Devillers 1977; Brooke 1978b; Sibley and Monroe 1990; Christidis and Boles 1994; Furness 1987, 1996; Olsen and Larsson 1997). In adult and juvenile plumages and in size, *pomarinus* resembles the *Stercorarius* group (summarised in Furness 1987), whereas in behaviour it is more like the *Catharacta* group (Andersson 1973). Phenetic analyses of osteological characters (Schnell 1970) were equivocal, in some analyses aligning *pomarinus* with *Catharacta skua* and in others with *Stercorarius*. Ectoparasite data linked *pomarinus* with the *Catharacta* group, as the sister taxon to *C. skua* (Cohen *et al.* 1997; Andersson 1999a). Cladistic analysis of size and plumage characters (Andersson 1999a) recovered the conventional *Stercorarius* and *Catharacta* clades.

The results from molecular data have identified additional issues surrounding the affinities of *pomarinus* and the number of genera that should be recognised. Mitochondrial DNA sequence data (based on cytochrome-*b* and 12S RNA) identified two assemblages. The first comprised *Stercorarius longicaudus* and *S. parasiticus*; the second contained the remaining taxa. Within the latter assemblage, *S. pomarinus* and *Catharacta skua skua* formed a sister group to the exclusion of the remaining *Catharacta* taxa (Blechschmidt *et al.* 1993; Peter *et al.*1994; Cohen *et al.* 1997). Braun and Brumfield (1998), however, demonstrated that an alternative hypothesis in which *S. pomarinus* was a sister species to a monophyletic *Catharacta* assemblage could not be rejected by the mitochondrial DNA data. They argued that the varied molecular data presented in Cohen *et al.* (1997) supported the close relationship between *S. pomarinus* and *Catharacta,* but contradicted a sister relationship between *S. pomarinus* and *C. skua skua*.

Cohen *et al.* (1997) proposed three alternative hypotheses to explain the data from the mitochondrial DNA on the basis that it is inherited maternally:

(1) *S. pomarinus* and *C. skua skua* share an ancestral DNA polymorphism that was present in the lineage giving rise to both *Stercorarius* and *Catharacta* and that the resemblance between *C. s. skua* and other *Catharacta* taxa is convergent.
(2) *S. pomarinus* and *C. skua skua* again share an ancestral DNA polymorphism, but it is the resemblances between *S. pomarinus* to other *Stercorarius* taxa that are convergent.
(3) *S. pomarinus* is a stable hybrid species that originated from crosses involving female *C. skua skua* and a *Stercorarius* taxon, such as *parasiticus*.

This last hypothesis was also proposed by Blechschmidt *et al.* (1993) and Peter *et al.* (1994). According to Cohen *et al.* (1997), the available data can not distinguish between the three alternatives.

Braun and Brumfield (1998) raised another hypothesis, proposing that *pomarinus* is the sister lineage to a monophyletic *Catharacta*, in which case this species should be separated into the genus *Coprotheres* Reichenbach 1850. Andersson (1999a) rejected the ancestral polymorphism hypotheses and proposed that the original mitochondrial DNA of *C. skua skua* was replaced with that of *S. pomarinus* through introgressive hybridisation. Andersson (1999b) also contended that *pomarinus* was more closely related to the *Catharacta* group than to the *Stercorarius* group. This would be recognised by either placing all skuas and jaegers in

Stercorarius or transferring *pomarinus* to *Catharacta*. Andersson (1999a, b) preferred the first option, as did Sangster *et al.* (1999), and such a treatment is adopted here. (Note that when placed in *Stercorarius*, *antarctica* becomes *antarcticus*.) Resolving what subgenera should be recognised and their composition awaits further study.

Species limits within the group are far from resolved. Peters (1934) maintained all forms of *Catharacta* (*sensu stricto*) as *C. skua*; in contrast, Condon (1975) and Devillers (1977, 1978) also recognised *C. maccormicki* and *C. chilensis* as separate species. Brooke (1978b) presented a case advocating the segregation of *antarctica*, *hamiltoni* and *lonnbergi* as a separate species: *C. antarctica*. Furness (1987), however, considered that all three should be continue to be treated as subspecies of *C. skua* – a proposal followed by Christidis and Boles (1994). Sibley and Monroe (1990) recognised *C. maccormicki*, *C. chilensis*, *C. skua*, *C. antarctica* (including *hamiltoni*) and *C. lonnbergi* as species. Furness (1996) and Olsen and Larsson (1997) accepted the first four species, but retained *lonnbergi* in *C. antarctica*. Johnstone and Storr (1998) included *antarctica* in *skua*.

The mitochondrial DNA sequence data (Cohen *et al.* 1997) indicate that members of the '*Catharacta* group' have diverged very recently. DNA distances between the forms *maccormicki*, *chilensis*, *antarctica*, *hamiltoni* and *lonnbergi* range from 0% to 0.7% – an order of magnitude less than that observed between *Stercorarius longicaudus* and *S. parasiticus* (6.9%). The forms *skua* and *pomarinus* differ from each other by 0.4%, from the *Catharacta*-group by 1.2 –1.4% and from the '*Stercorarius* group' by 8.1–9.7%. It could be argued that apart from *skua*, the remaining members of the *Catharacta*-group be treated as a single species. Owing to the unusual relationship between *skua* and *pomarinus*, the recorded distances between them cannot be used as a yardstick for assessing those between other taxa in this group.

In the phylogeny of this group presented by Peter *et al.* (1994), *hamiltoni* was the earliest diverged lineage, followed by *maccormicki*, although given the low divergences between the taxa, the branching patterns are not robust. Further investigation is required to ascertain the number of species that should be recognised among Southern Hemisphere forms (*maccormicki*, *chilensis*, *antarcticus*, *hamiltoni* and *lonnbergi*). For the present, the treatment in Furness (1996) and Olsen and Larsson (1997) is tentatively accepted here: *skua*, *maccormicki*, *chilensis* and *antarcticus* (includes *hamiltoni* and *lonnbergi*) are treated as species. The form recorded from the Australian region and breeding on Heard and Macquarie Islands is *antarctica lonnbergi*. Application has been made to the International Commission for Zoological Nomenclature for conservation of the name *lonnbergi* Mathews, 1912 over *madagascariensis* Bonaparte, 1856 (Voisin *et al.* 1993). Pending a ruling, retention of *lonnbergi* is maintained as the prevailing usage (ICZN 1999: Article 82).

Hybridisation between *maccormicki* and *lonnbergi* occurs in the area of the Antarctic Peninsula, where it has been known for many years. Mixed pairs have reproductive success comparable to that of pure species pairs, but their numbers fluctuate more (Hahn *et al.* 2003; Ritz *et al.* 2006).

The species sequence adopted here (*S. maccormicki*, S. *antarcticus*, *S. pomarinus*, S. *parasiticus*, *S. longicaudus*) follows Furness (1996), as it best reflects the molecular data.

Stercorarius maccormicki	South Polar Skua
Stercorarius antarcticus	Brown Skua
Stercorarius pomarinus	Pomarine Jaeger
Stercorarius parasiticus	Arctic Jaeger
Stercorarius longicaudus	Long-tailed Jaeger

Family Laridae

A case can be made for recognising separate families for the gulls and terns. Work by Baker et al. (2007), however, contradicted previous studies (e.g. Bridge 2005) by finding *Anous* (noddies) and *Gygis* (*G. alba*; White Tern) to be successive sister groups to the remainder of the terns and gulls. For the time being, a single family is recognised.

Gull and terns are rather uniform in their plumage and morphology. This has lead to a conservative classification that split these into a small number of genera. Studies using morphology and molecular techniques demonstrate that external appearance is a somewhat unreliable indicator of where affinities among these groups lie, owing to the extensive amounts of convergence in some plumage characters.

The number of tern and noddy genera recognised has varied greatly between works. Peters (1934) recognised 10 genera: *Sterna* (typical terns), *Thalasseus* (Crested Tern and allies), *Chlidonias* (Whiskered Tern and allies), *Gelochelidon* (*G. nilotica*; Gull-billed Tern), *Hydroprogne* (*H. caspia*; Caspian Tern), *Phaetusa* (*P. simplex*; Large-billed Tern), *Larosterna* (*L. inca*; Inca Tern), *Procelsterna* (grey ternlets), *Anous* (noddies) and *Gygis* (*G. alba*; White Tern). (For convenience of reference, these generic names are used in the following discussion.) All ten genera were accepted by Burger and Gochfeld (1996), but most other authors have included *Thalasseus* within *Sterna* (e.g. Condon 1975; Harrison 1985; Cramp 1985; Sibley and Monroe 1990; Christidis and Boles 1994). Debate also centred on whether *Chlidonias*, *Gelochelidon* and *Hydroprogne* should also be included within *Sterna*, as was done by Moynihan (1959) and Johnstone and Storr (1998), among others. Condon (1975) kept all three genera separate from *Sterna*, whereas Harrison (1985), Sibley and Monroe (1990) and Christidis and Boles (1994) combined *Gelochelidon* and *Hydroprogne* with *Sterna,* while retaining *Chlidonias* separate. Cramp (1985) recognised *Chlidonias* and *Gelochelidon*. Randi and Spina (1987) examined protein allozyme variation in five species of tern: *Sterna albifrons* (Little Tern), *S. sandvicensis* (Sandwich Tern), *S. hirundo* (Common Tern), *G. nilotica* and *Chlidonias hybrida* (Whiskered Tern). Recognition of *Gelochelidon* and *Chlidonias* as separate genera was not supported by a phenetic analysis of the data, which placed *nilotica*, *hybrida* and *hirundo* in one cluster, and *albifrons* and *sandvicensis* in a second. A more comprehensive protein allozyme study undertaken by Hackett (1989), which involved 14 species of tern, identified *Chlidonias* (represented by *niger*, Black Tern) and *Sterna antillarum* (Least Tern) as early diverging members of the group. *Phaetusa simplex* (Large-billed Tern) and *Gelochelidon nilotica* were linked together. Another question is whether *Procelsterna*, *Anous* and *Gygis* could be combined (e.g. Moynihan 1959). *Gygis* is distinguished largely because of its bill shape and all white plumage.

Thomas *et al*. (2004b), using supertrees, recovered several clusters that were largely congruent with many of the genera of Peters (1934), while relationships among others could not be resolved or grouped species that had not been associated previously. Bridge *et al*. (2005) addressed the problem of tern genera by comparing 2800 base pairs of mitochondrial DNA. They found that, like gulls, terns exhibited considerable convergence within a rather conserved range of plumage types. Their findings supported recognition of all of Peters' (1934) genera, with his *Sterna* further subdivided to accept *Onchyprion* (brown-backed terns, including *fuscata*, Sooty Tern, and *anaethetus*, Bridled Tern) and *Sternula* (little terns, including *albifrons* and *nereis*, Fairy Tern). *Anous* and *Gygis* were subsequently found to fall outside the remaining terns and gulls (Baker *et al*. 2007). Although not included in this study, *Procelsterna* presumably was associated with these genera.

The generic name *Chlidonias* is considered to be masculine (Mees 1977). The specific names here follow AOU (1983), except that the specific epithet *hybrida* is a masculine Latin noun and does not change its ending (David and Gosselin 2002a). Whether the Black-fronted Tern (*albostriata*) from New Zealand should be included in this genus (e.g. Sibson 1948; Kinsky 1970; Sibley and Monroe 1990) or in *Sterna* (e.g. Peters 1934; Mees 1977; Lalas and Heather 1980) has been a matter of ongoing debate, although most recent treatments have included it in *Sterna* (e.g. Gochfeld and Burger 1996; Higgins and

Davies 1996; Holdaway *et al*. 2001; Dickinson 2003). Bridge *et al.* (2005), however, concluded that this species was a member of *Chlidonias*.

The substantial differences in size and other morphological aspects, plumage and moult cycles between subspecies of *Gelochelidon nilotica* occurring in Australia were enumerated by Rogers *et al.* (2005). Relationships between the Australian breeding form *macrotarsa* and migratory subspecies need to be investigated using molecular methods.

Johnstone and Storr (1998) elevated the subspecies of *S. albifrons* occurring in Australia to species level, *S. sinensis* (White-shafted Little Tern).

Harrison (1985) listed *Anous minutus* (Black Noddy) as a subspecies of *A. tenuirostris* (Lesser Noddy), but most works have treated the two as separate species (e.g. Peters 1934; Sibley and Monroe 1990; Christidis and Boles 1994; Gochfeld and Burger 1996; Holdaway *et al*. 2001; Dickinson 2003; Bridge *et al*. 2005), and this is maintained here.

The taxonomic status of the form of *Procelsterna* in Australian waters is problematic. Murphy (1936) separated the larger, paler *Procelsterna albivitta* (Grey Ternlet) of the subtropical Pacific, south of 25°S, from the smaller, darker *P. cerulea* (Blue Ternlet) of the tropical Pacific, north of 25°S. Condon (1975) followed Murphy's suggestion, whereas Harrison (1985), Pratt *et al.* (1987) and Turbott (1990), for example, recognised only *P. cerulea*. Sibley and Monroe (1990) initially maintained two species, but subsequently (Sibley and Monroe 1993) combined them. Christidis and Boles (1994) pointed out that no convincing case had been made for either taxonomic treatment and so adopted the more widespread treatment of only recognising *P. cerulea*. Gochfeld and Burger (1996) accepted two species, as did Dickinson (2003). James and Scofield (1996) re-assessed variation within the *P. cerulea*-*albivittata* complex (eight were recognised by Gochfeld and Burger 1996) and concluded that only a few subspecies warranted recognition. Bridge *et al.* (2005) could not resolve the issue. Acceptance of two species would not alter the applicable name for Australian birds. Only a single species is maintained here pending further study on the issue of species and subspecies limits within the complex.

Most works (e.g. Peters 1934; Harrison 1985; Christidis and Boles 1994; Gochfeld and Burger 1996) have accepted a single species of *Gygis* (*G. alba*). Holyoak and Thibault (1976) noted that the most morphologically distinct population was that of the larger Marquesas Islands (*microrhyncha*), but because of apparent interbreeding with *G. alba candida*, kept it as a subspecies. Based on unpublished information, Pratt *et al.* (1987) raised *microrhyncha* to specific level, and this practice was followed by Sibley and Monroe (1990). Wingate and Watson (1974) and AOU (1998) identified three major subgroups of white terns, which Olson (2005) regarded as a distinct species. Condon (1975) placed Australian records in the subspecies *royana*. However, this species has been merged with *candida* (Holyoak and Thibault 1976). If three species are recognised, the Australian birds become *G. candida*; however, this action would be premature on the basis of evidence thus far published, and consequently it is not followed here.

Chu (1998) summarised the variation between works in the number of gull genera recognised and their composition. Most recent treatments accepted a large genus *Larus* with around 45 species, and a varying number of smaller genera with one or two species, e.g. *Pagophila* (*P. eburnea*; Ivory Gull), *Rhodostethia* (*R. rosea*; Ross' Gull), *Xema* (*X. sabini*; Sabine's Gull), *Creagrus* (*C. furcatus*; Swallow-tailed Gull) and *Rissa* (kittiwakes). All were recognised by Sibley and Monroe (1990) and Burger and Gochfeld (1996). In addition, the latter authors separated a monotypic *Leucophaeus* (*L. scoresbii*; Dolphin Gull). Cramp and Simmons (1983) also recognised most of these genera, differing only by including *sabini* in *Larus*. The list in Christidis and Boles (1994) reflected this treatment. Harrison (1985) recognised only *Larus*, *Pagophila* and *Rhodostethia*.

Recent morphological (Chu 1998) and molecular studies (Crochet and Desmarais 2000; Crochet *et al.* 2000) demonstrated that *Larus* as currently defined is paraphyletic. Analyses of osteological and plumage characters by Chu (1998) identified two major assemblages, although their separation was not strongly supported by the data. One group comprised the various small genera (*Pagophila*, *Rhodostethia*, *Xema*, *Creagrus*, *Rissa*), *Larus minutus* (Little Gull), *L. saundersi* (Saunder's Gull), together with the hooded gulls and allies (*genei*, *philadelphia*, *ridibundus*, *serranus*, *cirrocephalus*, *novaehollandiae*, *hartlaubi*, *bulleri*, *maculipennis*, *brunnicephalus*). Within this assemblage, five smaller lineages were recognisable:

(1) *Xema* and *Creagrus*
(2) *Rissa*
(3) *Pagophila*
(4) *minutus* and *Rhodostethia*
(5) *saundersi* plus the hooded gulls and allies.

The second major assemblage comprised the remaining species of *Larus*. Chu (1998) proposed three taxonomic alternatives: recognition of (1) a single genus, (2) each of the two major assemblages as a genus or (3) six genera. He favoured regarding all as a single genus.

Mitochondrial DNA sequence analyses based on the cytochrome-*b* gene and the control region (Crochet and Desmarais 2000; Crochet *et al.* 2000) supported many of the findings of Chu (1998). The DNA data also identified a major separation between the masked gulls and allies and the remaining members of *Larus*. However, the data weakly aligned *Xema*, *Creagrus*, *Rissa*, *Pagophila*, *Rhodostethia* and *minutus* with the second major assemblage of Chu (1998) and not with the masked gulls. Another significant difference between DNA and morphological data sets involved the placement of *Xema*. The DNA data did not support a sister relationship between *Xema* and *Creagrus*; instead the former was more closely aligned with *Pagophila*. The possible association between *Rhodostethia* and *minutus* was not tested as the DNA data were not available on the former. Crochet *et al.* (2000) recommended recognition of the following genera: *Xema*, *Creagrus*, *Rissa*, *Pagophila*, *Rhodostethia*, *Hydrocoleus* (for *minutus*), *Chroicocephalus* (for the masked gulls and allies along with *saundersi*) and *Larus* (for the remaining species). Furthermore, these authors noted that the placement of *saundersi* was tentative, as was recognition of both *Rhodostethia* and *Hydrocoleus*; further study was needed to determine if the latter two genera could combined.

Pons *et al.* (2005) extended and refined the work of Crochet *et al.* (2000) using the same gene systems, but including all the species of gulls accepted by Burger and Gochfield (1996). They recovered the same major divisions, but were better able to resolve the smaller clades. From their results, Pons *et al.* (2005) proposed accepting ten genera of gulls. They admited *Creagrus*, *Rissa*, *Pagophila*, *Xema*, *Hydrocoleus* (which included *Rhodostethia*), *Chroicocephalus* and *Saundersilarus* (for *saundersi*). *Larus* was further subdivided with *Ichthyaetus* used for the Palaearctic 'black-headed' species (e.g. *ichthyaetus* and *melanocephalus*) and *Leucophaeus* for the New World 'hooded' species (e.g. *atricilla*, *pipixcan* and *scoresbii*). The treatment proposed by Pons *et al.* (2005) is consistent with both morphological and DNA data and is adopted here. Consequently, within Australia, the three resident species fall into two genera, *Larus* (*pacificus*, Pacific Gull; *dominicanus*, Kelp Gull) and *Chroicocephalus* (*novaehollandiae*, Silver Gull).

Dwight (1925), followed by Peters (1934), recognised five subspecies in the *Chroicocephalus novaehollandiae* complex: *novaehollandiae* (southern Australia), *gunni* (Tasmania), *forsteri* (northern Australia and New Caledonia), *scopulinus* (New Zealand) and *hartlaubi* (southern Africa). Condon (1975) and Harrison (1985) differed by including *gunni* in the nominate form. Johnstone's (1982) detailed revision of the complex concluded that *hartlaubi* (Hartlaub's Gull) was a separate species – an action that has received wide acceptance, e.g. Sibley and Monroe

(1990); Burger and Gochfeld (1996); Higgins and Davies (1996). Johnstone also restricted *forsteri* to New Caledonia and treated all Australian populations as the nominate form. These actions were followed by James and Eades (1996). Sibley and Monroe (1990) further separated *scopulinus* (Red-billed Gull; New Zealand) as a separate species, but without providing any justification. Although this treatment was followed by Burger and Gochfeld (1996), most other authors continued to include *scopulinus* as a subspecies of *novaehollandiae* (e.g. Turbott 1990; Higgins and Davies 1996; Holdaway *et al*. 2001).

The supertree of Thomas *et al*. (2004b) placed *novaehollandiae* and *bulleri* (*C. bulleri*; Black-billed Gull; New Zealand) together as the sister taxon to *hartlaubi*, with *scopulinus* in a cluster with *ridibundus*, *cirrocephalus* and others. The unexpected relative positions of *novaehollandiae*, *scopulinus* and *hartlaubi* in this tree (Thomas *et al*. 2004b: Fig. 3) suggests that there was an error in labeling (presumably a transposition of *scopulinus* and *hartlaubi*), as other studies have not recovered the supertree topology for these taxa. Pons *et al*. (2005) found that *novaehollandiae*, *scopulinus* and *bulleri* formed a trichotomy, with *hartlaubi* further removed. Given *et al*. (2005) used DNA sequence data from four mitochondrial genes to assess relationships among the Southern Hemisphere 'masked' gulls. Their results showed that *bulleri* was the sister species to *novaehollandiae* and *scopulinus*, which they treated as subspecies of a single species, and supported the alliance of *hartlaubi* with *cirrocephalus*, rather than the *novaehollandiae* cluster.

A previous record of *Sternula saundersi* (Saunder's Tern; supplementary list), included in Condon (1975), is unlikely to be a valid record, as discussed in McAllan and Bruce (1988: 79; see also Higgins and Davies 1996); a recent report from South Cocos Island supported by photographs, is awaiting consideration by BARC (Dooley 2007b). A report of *Sterna virgata* (Kerguelen Tern) off Heard Island, also with photographs, is awaiting consideration by BARC (Dooley 2005d).

Species accepted as vagrants to Australia and its Territories are *Larus crassirostris* (Black-tailed Gull), *Leucophaeus pipixcan* (Franklin's Gull), *Leucophaeus atricillus* (Laughing Gull), *Chroicocephalus ridibundus* (Black-headed Gull), *Xema sabini* and, added since Christidis and Boles (1994), *Larus canus* (Mew Gull; BARC 315) from Christmas Island.

Larus fuscus (Lesser Black-backed Gull) was placed on the supplementary list by Christidis and Boles (1994). Its presence has been confirmed by a record uncovered in the Australian Bird and Bat Banding Scheme. A bird banded in Finland in 1957 was found dead on South Island, Cocos (Keeling) Islands, in 1959 (Johnstone and Darnell 2004a; Anon 2005).

The sequence begins with *Anous* and *Gygis* (Baker et al. 2007), followed by *Procelsterna*. Next are the remaining terns, following the sequence of genera and species sequences recommended by Bridge *et al*. (2005). Gulls follow Pons *et al*. (2005).

Anous stolidus	Common Noddy
Anous minutus	Black Noddy
Anous tenuirostris	Lesser Noddy
Gygis alba	White Tern^{V,LH,CK,N}
Procelsterna cerulea	Grey Ternlet ^{V,LH,N}
Onychoprion fuscata	Sooty Tern
Onychoprion anaethetus	Bridled Tern
Sternula albifrons	Little Tern
Sternula nereis	Fairy Tern
Sternula saundersi	Saunder's Tern$^{S(CK)}$
Gelochelidon nilotica	Gull-billed Tern
Hydroprogne caspia	Caspian Tern
Chlidonias hybrida	Whiskered Tern
Chlidonias leucopterus	White-winged Black Tern
Chlidonias niger	Black Tern^{V}
Sterna dougallii	Roseate Tern
Sterna striata	White-fronted Tern
Sterna sumatrana	Black-naped Tern
Sterna hirundo	Common Tern
Sterna paradisaea	Arctic Tern
Sterna vittata	Antarctic Tern ^{V,M,H}
Sterna virgata	Kerguelen Tern$^{S(H)}$
Thalasseus bengalensis	Lesser Crested Tern
Thalasseus bergii	Crested Tern
Larus pacificus	Pacific Gull

Larus fuscus	Lesser Black-backed Gull$^{CK/V}$
Larus dominicanus	Kelp Gull
Larus canus	Mew Gull$^{C/V}$
Larus crassirostris	Black-tailed Gull^{V}
Leucophaeus atricilla	Laughing Gull^{V}
Leucophaeus pipixcan	Franklin's Gull^{V}
Chroicocephalus novaehollandiae	Silver Gull
Chroicocephalus ridibundus	Black-headed Gull^{V}
Xema sabini	Sabine's Gull^{V}

ORDER PSITTACIFORMES

Peters (1937) recognised a single family Psittacidae in the order Psittaciformes – an arrangement followed by many subsequent authors (e.g. Smith 1975; Homberger 1980; Sibley and Monroe 1990). Forshaw (1973) divided the order into three families: Cacatuidae (cockatoos), Psittacidae (parrots) and Loriidae (lorikeets). Smith (1975), based on analysis of a range of morphological, anatomical and behavioural characters, recognised four subfamilies: Psittacinae (African parrots, excluding *Agapornis*, lovebirds), Arinae (New World parrots), Platycercinae (cockatoos, Australian broad-tailed parrots and New Zealand parrots) and Loriinae (lorikeets, *Agapornis*, Asian parrots, Australasian parrots other than platycercines).

Based on an analysis of morphological features associated with feeding and drinking, Homberger (1980) treated the three families of Forshaw (1973) as subfamilies, while also separating *Loriculus* (hanging-parrots) and *Psittrichas* (*P. fulgidus*, Pesquet's Parrot) in their own subfamilies: Loriculinae and Psittrichadinae, respectively. She did not consider the New World Parrots in her study. In a subsequent classification (Homberger 2003), she elevated these subfamilies to family level, as well as also recognising monogeneric families for *Nestor* (Kea and kakas: Nestoridae), *Strigops* (*S. habroptilus*, Kakapo: Strigopidae) and *Micropsitta* (pygmy parrots: Micropsittidae). The New World parrots were included as a subfamily of the Psittacidae.

Christidis *et al.* (1991a) examined relationships among Australasian parrots, lorikeets and cockatoos using protein allozyme data (taxa from the Psittacinae and Arinae as defined by Smith (1975) were not represented). Their analyses revealed two distinct clades, best recognised as families: Cacatuidae (cockatoos) and Psittacidae (parrots and lorikeets). Support for the unity of the cockatoos also comes from the possession of a 'wheezing' juvenile food begging call and food-swallowing vocalisations that are unique to this group (Courtney 1996). Christidis and Boles (1994) and Schodde (1997b, c) followed this treatment for the Australasian taxa. Collar (1997b) modified the family treatment of Forshaw (1973), better reflecting the findings of Christidis *et al.* (1991a), recognising two families in the order: Cacatuidae and Psittacidae. The Psittacidae were further divided into the subfamilies Psittacinae (parrots) and Loriinae (lorikeets).

Sibley and Monroe (1990) and Dickinson (2003) maintained a single family, but the former authors made no subdivisions, while the latter accepted eight subfamilies: Nestorinae, Strigopinae, Psittrichadinae, Loriculinae, Micropsittinae, Cacatuinae, Loriinae and Psittacinae. The last family contained five tribes: Platycercini (broad-tailed parrots), Psittaculini (*Psittacula* and allies), Psittacini (African parrots), Arini (South American parrots) and Cyclopsittini (fig-parrots). Schodde (1997c) maintained the Cacatuidae and Psittacidae for the Australian psittaciforms. In the latter family, he admitted the Nestorinae, Loriinae, Platycercinae and three unplaced tribes: Psittaculini, Polytelini (long-tailed parrots) and Cyclopsittini. Homberger (2003) removed the Nestorinae and Loriinae, elevating them to family level, and accepted four subfamilies in the Psittacidae: Platycercinae, Psittaculinae, Psittacinae and Arinae.

Sibley and Ahlquist (1990) included few taxa in their DNA–DNA hybridisation studies and most DNA sequence studies have focussed on single genera or lineages (e.g. Leeton *et al.* 1994; Eberhard 1998; Boon *et al.* 2001a, b). In a small study of mitochondrial cytochrome-*b* DNA sequences, Birt *et al.* (1992) concluded that the cockatoos were the sister clade to another clade that included Australian, African and South American parrots. Their study was based on only 307 base pairs of DNA sequence, which is far too few for such taxonomic comparisons. Miyaki *et al.* (1998) examined relationships within the order using only 267 base pairs from the cytochrome-*b* gene. Their study did not recover monophyly for the Australasian parrots, but indicated that the Arinae and Psittacinae of Smith (1975) were sister lineages and these, in turn, were linked to the cockatoos. It is not possible to make any valid conclusions based on these small data sets.

Nemesio (2001) considered the distribution of structural colours and pigments in the plumage of different groups of the Psittaciformes. He concluded that this supported the Cacatuidae as a monophyletic lineage that probably diverged early in parrot history.

Homberger (2003) used bill morphology to reconstruct the evolutionary history of this order. She identified two major bill types, which she called calyptorhynchid and cacatuid types. The former characterised the black-cockatoos (*Calyptorhynchus*) and pygmy-parrots (*Micropsitta*). All remaining cockatoos and other parrot groups had the psittacid bill morphology. Homberger (2003) interpreted the calyptorhynchid bill to be the primitive condition in the Psittaciformes, from which the psittacid bill form had arisen on numerous occasions. Recently discovered fossils interpreted as early parrot and parrot relatives (Mayr and Daniels 1998; Mayr 2002) caution against over-reliance on bill morphology of modern taxa to interpret the evolutionary history of this group. These fossil taxa lacked the specialised bill structure that characterises modern parrots.

Based on the structure of the tarsometatarsus, Mayr and Gröhlich (2004), identified a derived condition that supports the monophyly of the clade including *Psephotus*, *Platycercus*, *Northiella*, *Barnardius*, *Cyanoramphus*, *Eunymphicus* (horned parakeets; New Caledonia), *Prosopeia* (shining parrots; Fiji) and, in a somewhat modified form, *Melopsittacus* (*M. undulatus*; Budgerigar). *Neophema* and *Neopsephotus* retained the presumed primitive condition. The authors also discerned similarities among the lorikeets, hanging parrots and lovebirds. *Eclectus*, *Geoffroyus*, *Tanygnathus* (thick-billed parrots; south-east Asia, Indonesia, Philippines), *Psittacula* (ring-necked parrots; south and south-east Asia) and *Psittinus* (*P. cyanurus*; Blue-rumped Parrot; south-east Asia) were united based on the possession of a greatly expanded trochlea for digit II. In a study of an intron in the spindlin Z and W genes, de Kloet and de Kloet (2005) obtained four major subdivisions of the Psittaciformes. The New Zealand genera *Strigops* and *Nestor* (*N. notablis*, Kea; *N. meridionalis*, Kaka) were the sister group to all other living parrots. Another group comprised the cockatoos. The third group contained the platycerines, psittaculines, lorikeets, fig-parrots and lovebirds. Within this, the lorikeets, Budgerigar, fig-parrots and lovebirds grouped together, as did *Cyanoramphus*, *Barnardius*, *Psephotus* and *Platycercus* – with *Neopsephotus* related to, but outside of, the last assemblage. *Aprosmictus* and *Polytelis* were closely related and associated with a cluster of *Eclectus*, *Psittacula* and *Tanygnathus*. The last group comprises the South American parrots, plus *Coracopsis* (vasa parrots, Madagascar) and *Psittrichas* (New Guinea).

Munshi-South and Wilkinson (2005) generated a supertree of the Psittaciformes as part of a study on relationship of diet and longevity in this order. The resulting topology had few meaningful branching patterns, as well as failing to associate members of generally accepted groups, such as the genera of fig-parrots or the genera of platycercines. There was also little internal resolution within genera.

Astuti *et al.* (2006) sequenced 907 base pairs of mitochondrial cytochrome-*b* gene from a limited range of parrot taxa. They had representatives of cockatoos, lorikeets, fig-parrots, *Loriculus*, *Psittrichas*, *Tanygnathus*, *Psittacula*, *Eclectus* and *Aprosmictus*. The study lacked *Strigops*, *Nestor* and any platycercines or New World parrots. Cockatoos were the sister taxon to the remaining forms. The lorikeets and fig-parrots were sister taxa, as were *Loriculus* and *Psittrichas*. *Tanygnathus–Psittacula* and *Eclectus–Aprosmictus* formed a clade. The absence of several critical taxa prevents resolution of some relationships, but the association of fig-parrots and lorikeets is likely to be significant.

For the present, the maintenance of three families in the order is justified: Nestoridae, Cacatuidae and Psittacidae; subsequent work may well show that the first should be further subdivided into the Strigopidae and Nestoridae (these names have equal priority, both appearing in Bonaparte 1849). Livezey and Zusi (2007) recognised these three families, but also segregated the lorikeets as Loriinidae [sic].

Family Nestoridae

The now extinct *Nestor productus* (Norfolk Island Kaka) was closely related to *N. meridionalis* (Kaka; New Zealand), but has been accepted as being a distinct species by almost all authors.

Nestor productus	Norfolk Island Kaka$^{N/E}$

Family Cacatuidae

Schodde (1997b) recognised four subfamilies in the Cacatuidae:

(1) Microglossinae for *Probosciger aterrimus* (Palm Cockatoo)
(2) Calyptorhynchinae for *Calyptorhynchus* (black-cockatoos)
(3) Cacatuinae for *Cacatua* (white cockatoos and corellas), *Eolophus roseicapillus* (Galah) and *Callocephalon fimbriatum* (Gang-gang Cockatoo)
(4) Nymphicinae for *Nymphicus hollandicus* (Cockatiel).

He also suggested that *Callocephalon* might warrant its own subfamily. Homberger (2003) maintained the same subfamilies, but included *Callocephalon* in the Calyptorhynchinae.

In their study of protein allozyme variation in the Cacatuidae, Adams *et al.* (1984) identified two major clades corresponding to the Cacatuinae and Calyptorhynchinae–Nymphicinae as defined above; these authors did not include *Probosciger* in their study. Courtney (1996) found that *Nymphicus* and *Callocephalon* differ from the others in having juveniles that displayed a more parrot-like head-bobbing when begging for food. Brown and Toft (1999) examined relationships of all genera of Cacatuidae using DNA sequence data from a portion of the mitochondrial 12S ribosomal subunit gene. They obtained a close association between *Nymphicus* and *Calyptorhynchus*. In contrast to the grouping advocated by Schodde (1997b), *Callocephalon* was associated by the DNA sequence data with these two genera and not with the Cacatuinae. *Probosciger* was found to be the first generic divergence in the family. Based on their phylogenetic analyses, Brown and Toft (1999) questioned the validity of the subfamilies Cacatuinae, Calyptorhynchinae and Nymphicinae as defined by Schodde (1997b). The study of Astuti *et al.* (2006) included only *Probosciger* and several species of *Cacatua*. It is probably premature to recognise subfamilies in the Cacatuidae based on the available data.

The black-cockatoo genus *Calyptorhynchus* comprises two subgenera (Peters 1937; Schodde 1997b): *Calyptorhynchus* (*banksii*, *lathami*) and *Zanda* (*funereus*, *baudinii*, *latirostris*). Courtney (1996) noted differences in juvenile food-begging displays between them. Schodde (1997b) suggested that the two could represent separate generic recognition and, while such a move is not adopted here, the issue merits further investigation.

The relationships among the often quite morphological divergent subspecies of *Calyptorhynchus banksii* (Red-tailed Black-Cockatoo) need examination. Some, such as *graptogyne* (south-east Australia), have been suggested as representing a separate species (see Schodde 1997b).

Peters (1937) listed *Calyptorhynchus funereus* (Yellow-tailed Black-Cockatoo; eastern Australia) and *C. baudinii* (White-tailed Black-Cockatoo; south-western Australia) as two species, whereas Forshaw (1973) combined them. Condon (1975) recognised both at specific level – each comprising two subspecies. Saunders (1979) revised the taxonomy of the complex and transferred one of the white-tailed forms (*latirostris*) from *C. baudinii* to *C. funereus*. Analysis of protein allozymes (Adams *et al.* 1984) revealed the two white-tailed forms have a sister relationship. Sibley and Monroe (1990), Schodde and Tidemann (1986) and Christidis and Boles (1994) treated these as separate species – *C. baudinii* (Long-billed Black-Cockatoo) and *C. latirostris* (Short-billed Black-Cockatoo) – from *C. funereus*. Subsequent authors (Collar 1997b; Schodde 1997b; Juniper and Parr 1998; Johnstone 2001; Dickinson 2003) followed this treatment. Although the preceding English names are those applied to the two white-tailed species in many references, in Western Australia where both species are endemic, the practice is to refer to *C. baudinii* as Baudin's Cockatoo and *C. latirostris* as Carnaby's Cockatoo (e.g. Johnstone 2001). These names, adopted here, have been recommended by the Birds Australia Common Names Committee.

The position of *Cacatua* (*Eolophus*) *roseicapilla* (Galah) is problematic. The protein allozyme data of Adams *et al.* (1984) placed it in *Cacatua*, close to the corellas (*C. sanguinea*, *C. pastinator* and *C. tenuirostris*), and on this basis Christidis and Boles (1994) included it within *Cacatua*. Courtney (1993, 2000) suggested that *Eolophus* was congeneric with *Cacatua* based on karyotype (Christidis *et al.* 1991b) and shared taxa of Mallophaga. Schodde (1997b), following Holyoak (1970c) and Forshaw (1981), separated it generically in *Eolophus*, citing several morphological characters in support of this treatment. He also recognised three subgenera in the more restricted *Cacatua*: *Cacatua* (white cockatoos), *Licmetis* (corellas) and *Lophochroa* (*leadbeateri*, Major Mitchell's Cockatoo). The last species has the most atypical juvenile food-begging display among the white cockatoos (Courtney 1996).

DNA sequence data (Brown and Toft 1999) do not support an association between *Eolophus* and the corellas. Instead, *Cacatua* (*Eolophus*) *roseicapilla* was found to be the sister lineage to the remainder of *Cacatua*. Although this is consistent with generic separation for this species, the study of Brown and Toft (1999) also identified *C. leadbeateri* as a distinct early diverging lineage in *Cacatua*. These authors argued that if *roseicapilla* was separated generically, then a case could be made for separating *leadbeateri*. Their DNA data also recovered the white cockatoo (subgenus *Cacatua*) and corella (subgenus *Licmetis*) clades. From the available data, two taxonomic options are equally supported: (1) recognise only *Cacatua* generically with four subgenera (*Lophochroa*, *Eolophus*, *Licmetis* and *Cacatua*) or (2) recognise three genera, *Lophochroa*, *Eolophus* and *Cacatua* (with two subgenera for Australian species). The latter arrangement was used by Homberger (2003) and is also adopted here. Inclusion of all non-Australian species of white cockatoos may necessitate further modification of these generic limits.

Peters (1937), Forshaw (1969, 1973) and Condon (1975) regarded the two long-billed corellas *pastinator* (western form) and *tenuirostris* (eastern form) as subspecies of *Cacatua tenuirostris*, while treating the short-billed form as a separate species, *C. sanguinea*. Schodde *et al.* (1979) analysed several bill, wing and plumage characters and concluded that both long-billed forms arose independently from the short-billed form, with eastern *tenuirostris* having diverged first. They treated *pastinator* and *sanguinea* as conspecific (*C. pastinator*) and *tenuirostris* as a separate species (*C. tenuirostris*) – a treatment followed by Forshaw (1981). Ford (1985) undertook a distance-based phylogenetic analysis of several morphological characters and instead suggested that the two long-billed forms could have evolved from a common long-billed ancestor. He recognised three separate species: the two long-billed forms *C. pastinator* (Western Corella) and *C. tenuirostris* (Long-billed Corella), and the short-billed *C. sanguinea* (Little Corella). Most authors have followed this treatment (e.g. Sibley and Monroe 1990; Christidis and Boles 1994;

Rowley 1997; Schodde 1997b; Juniper and Parr 1998; Johnstone 2001; Dickinson 2003). This treatment now accepted as conventional, but the issue would benefit from further study. It is probable that *C. sanguinea* and *C. pastinator* form a sister pair, as suggested by Schodde *et al.* (1979).

Peters (1937) and Forshaw (1969) treated *Cacatua goffini* (Tanimbar Corella; Tanimbar) as a subspecies of *C. sanguinea* (Australia, New Guinea). Later, Forshaw (1973, 1978) kept the two as separate species, arguing that if they were combined then *C. ducorpsii* (Solomons Corella; Solomon Islands) would also have to be combined. Current consensus is to treat *C. sanguinea*, *C. goffini* and *C. ducorpsii* as separate species (e.g. Sibley and Monroe 1990; Christidis and Boles 1994; Rowley 1997; Schodde 1997b; Juniper and Parr 1998; Dickinson 2003), and this is maintained here. Although from his phylogenetic analysis of morphological characters Ford (1985) concluded that *C. goffini* was a distinctive taxon within the *C. sanguinea–pastinator–tenuirostris* complex, this was not evident in the trees he presented.

In their DNA study, Brown and Toft (1999) included representatives of *Cacatua galerita* (Sulphur-crested Cockatoo) and *C. sulphurea* (Yellow-crested Cockatoo). They found that *C. galerita* was the sister species to the remainder of the '*galerita*' clade, at variance with conventionally accepted relationships, which align *C. sulphurea*, *C. galerita* and *C. ophthalmica* (Blue-eyed Cockatoo) as one group, and *C. alba* (White Cockatoo) and *C. moluccensis* (Salmon-crested Cockatoo) as another (e.g. Sibley and Monroe 1990; Rowley 1999). Schliebusch *et al.* (2001) examined relationships within the *Cacatua galerita–sulphurea* complex using DNA sequences of the mitochondrial cytochrome-*b* gene. They found *C. sulphurea* to be embedded in *C. galerita* as the latter species is normally accepted. This branching pattern, combined with genetic distances, led them to combine the two as one species, *C. sulphurea* Gmelin, 1788 (this name has precedence over *galerita* Latham, 1790). It should be noted, however, that Schliebusch *et al.* (2001) identified two divergent haplotypes within *C. galerita*, which were paraphyletic within the *C. galerita–sulphurea* complex. In this study, and that of Brown and Toft (1999), many of the samples were from captive birds, so there are issues with exact geographical origins, and the possibility of hybridisation in captivity. Among six species included in the study of Astuti *et al.* (2006), *galerita-sulphurea* and *moluccensis* were recovered as sister taxa, which then grouped with *alba*, as did *sanguinea* with *goffini* in a separate clade. Although it is likely that the findings of Schliebusch *et al.* (2001) regarding the relationships within the *C. sulphurea–C. galerita* complex will be supported by further data, for the present it is prudent to retain *C. galerita* as separate from *C. sulphurea*.

Probosciger aterrimus	Palm Cockatoo
Calyptorhynchus banksii	Red-tailed Black-Cockatoo
Calyptorhynchus lathami	Glossy Black-Cockatoo
Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo
Calyptorhynchus latirostris	Carnaby's Black-Cockatoo
Calyptorhynchus baudinii	Baudin's Black-Cockatoo
Callocephalon fimbriatum	Gang-gang Cockatoo
Lophochroa leadbeateri	Major Mitchell's Cockatoo
Eolophus roseicapillus	Galah
Cacatua tenuirostris	Long-billed Corella
Cacatua pastinator	Western Corella
Cacatua sanguinea	Little Corella
Cacatua galerita	Sulphur-crested Cockatoo
Nymphicus hollandicus	Cockatiel

Family Psittacidae

Which subdivisions within the Psittacidae should be formally recognised, and at what taxonomic rank, requires ongoing examination. There are several discrete clusters within the Psittacidae as here circumscribed, but limited agreement about how this should be reflected taxonomically. If each were regarded as at subfamilial level, then those represented in Australia are

- Loriinae (*Trichoglossus*, *Psitteuteles*, *Glossopsitta*)
- Cyclopsittinae (*Cyclopsitta*)
- Psittaculinae (*Eclectus*, *Geoffroyus*)
- Polytelinae (*Alisterus*, *Aprosmictus*, *Polytelis*)
- Platycercinae (*Platycercus*, *Barnardius*, *Purpureicephalus*, *Northiella*, *Lathamus*, *Psephotus*, *Cyanoramphus*, *Melopsittacus*, *Neopsephotus*, *Neophema*, *Pezoporus*).

Christidis *et al.* (1991a) included seven genera of lorikeets in their phylogenetic study of psittaciform relationships using protein allozyme data. They recorded very low genetic distances between these taxa relative to those recorded between closely related non-loriine parrot genera. The lowest distances were between the three genera occurring in Australia (*Trichoglossus*, *Psitteuteles* and *Glossopsitta*) and a case could be made for combining them. Forshaw (1969, 1981) merged *Psitteuteles* with *Trichoglossus* and, although some authors have followed this (e.g. Johnstone 2001 and Johnstone and Storr 1998), most keep the two separate (White and Bruce 1986; Sibley and Monroe 1990; Christidis and Boles 1994; Collar 1997b; Schodde 1997c; Juniper and Parr 1998). Forshaw (2002) resurrected *Psitteuteles* to reflect current usage, while emphasising that there was no morphological or biochemical evidence to support such separation.

There are several interpretations regarding the affinities and generic limits of *Psitteuteles* and *Trichoglossus* (summarised in White and Bruce 1986). There are a number of non-Australian genera that must be considered in any larger assessment of lorikeet classification. Until a more detailed appraisal of generic limits and relationships among the lorikeets is undertaken, the conventional treatment, which recognises *Trichoglossus*, *Glossopsitta* and *Psitteuteles* as separate genera, is maintained.

Courtney (1997a) reported that there were two types of juvenile food begging calls in the lorikeets: a hiss – found in *Trichoglossus*, *Psitteuteles*, *Glossopsitta*, *Lorius*, *Chalcopsitta*, *Eos*, *Pseudeos* and *Neopsittacus* – and a trill – in *Charmosyna*, *Vini*, *Phigys* and possibly *Oreopsittacus*. He also pointed that out, on the basis of having a trilling call, *Psittaculirostris* (fig-parrots) might be related to the latter group.

Astuti *et al.* (2006) included two species each of *Lorius*, *Chalcopsitta*, *Trichoglossus* and *Eos* and one each of *Charmosyna* and *Pseudeos*. *Trichoglossus* paired with *Eos*, and *Chalcopsitta* with *Pseudeos*. *Charmosyna* was a sister taxon to these four genera and *Lorius*. *Psittaculirostris* was found to be a sister genus to this assemblage.

Condon (1975) separated *Trichoglossus rubritorquis* (Red-collared Lorikeet) as a species separate from *T. haematodus* (Rainbow Lorikeet), but without providing reasons. Although Sibley and Monroe (1990), Juniper and Marr (1978), Schodde (1997c), and Dickinson (2003) accepted this, most authors have only recognised a single species (e.g. Forshaw 1981; Christidis and Boles 1994; Collar 1997b). Dunn (1999) noted considerable plumage and size differences between *T. h. rubritorquis* and *T. h. molucanus* and suggested these could be treated as separate species. Schodde (1977c) suggested that the *T. haematodus* complex comprised several species. In addition to *T. haematodus* (Moluccas, New Guinea, Australia, south-west Pacific) and *T. rubritorquis* (north-western Australia, eastern Lesser Sundas), Schodde (1997c) also proposed that *T. weberi* (Flores), *T. forsteni* (Lesser Sundas) and *T. capistratus* (eastern Lesser Sundas) should be recognised as separate species. These groupings largely correspond with those identified by White and Bruce (1986) and Collar (1997b), and they were accepted by Dickinson (2003). While there is a case for recognising further species in the *T. haematodus* complex, detailed data for such a revision are currently lacking. All forms are here treated as a single species, with the acknowledgment that several will probably be recognised as species once detailed work has been carried out.

The fig-parrot genera *Cyclopsitta* (including *Opopsitta*) and *Psittaculirostris* have sometimes been combined (e.g. Holyoak 1970c), but the most widespread treatment is to keep them separate (Sibley and Monroe; Christidis and Boles 1994; Collar 1997b; Schodde 1997c; Juniper and Parr 1998; Dickinson 2003), and this is followed here. *Cyclopsitta diophthalma* (Double-eyed Fig-Parrot) comprises eight subspecies (Forshaw 1978; Dickinson 2003), of which three occur in Australia (*marshalli*, *macleayana*, *coxeni*). The most distinctive subspecies is *coxeni* (Bartram 1999), which is possibly an incipient species (e.g. Collar 1997b; Juniper and Parr 1998) – DNA sequence data could help resolve this issue.

Melopsittacus has always been regarded as a platycercine genus. Some studies, however, have obtained results that challenge this conventional view. Christidis *et al*. (1991) recovered *Melopsittacus* close to the fig-parrots, although it was regarded as a platycercine taxon of disparate affinity in the Discussion. de Kloet and de Kloet (2005) also found an association between *Melopsittacus* and the fig-parrots and lorikeets. The phylogenetic position of *Melopsittacus*, and the possibility that it is not a platycercine parrot (as usually regarded), need more attention.

Most recent works have associated *Polytelis* (long-tailed parrots), *Alisterus* (king-parrots) and *Aprosmictus* (red-shouldered parrots), collectively called ‘rose-tailed parrots’ by some authors (e.g. Courtney 1997b). Courtney (1997b) found support for this grouping in the juvenile food begging calls and chick-to-parent contact calls. This genus grouping was recovered by de Kloet and de Kloet (2005). This was the sister clade to one that includes *Eclectus roratus* (Eclectus Parrot), *Tanygnathus* and *Psittacula*. The begging call of *Eclectus* is not like that of the other clade. The call of the unusual *Psittrichias fulgidus* (Pesquet’s Parrot; New Guinea), however, resembles the call of species of *Alisterus*.

While it is generally accepted that the genera *Platycercus* (rosellas), *Barnardius* (*B. zonarius*, Australian Ringneck), *Purpureicephalus* (*P. spurius*, Red-capped Parrot), *Northiella* (*N. haematogaster*, Blue Bonnet), *Psephotus* (grass parakeets) and *Lathamus* (*L. discolor*, Swift Parrot) are closely related (e.g. Collar 1997b; Schodde 1997c), it has not been resolved whether some of these should be combined. Christidis *et al*. (1991a) identified the group as a monophyletic assemblage based on a phylogenetic analysis of protein allozyme data. Members of the platycercines are characterised by a pale wing stripe across the remiges, and Courtney (2002) drew attention to the shared presence of another pale stripe across the greater underwing coverts.

Courtney (1997c) compared juvenile food begging calls across several genera of platycercines. In *Melopsittacus* and *Pezoporus*, juveniles give a pure sounding quavering whistle, which does not change as the chick gets older. In contrast, the calls in species of *Neophema*, *Neopsephotus*, *Psephotus*, *Platycercus* and *Purpureicephalus* change progressively as the chick ages. (*Lathamus*, *Northiella* and *Barnardius* were not represented.) The calls of both groups differ from those given by young cockatoos, lorikeets and other Australian parrots.

Johnstone and Storr (1998) and Johnstone (2001) followed Storr (1973) in combining all but *Lathamus* in *Platycercus*. The six genera are maintained here until new data suggest otherwise. The relationships between these genera and *Neophema* (neophemas), *Neopsephotus* (*N. bourkii*, Bourke’s Parrot), *Pezoporus* (*P. wallicus*, Ground Parrot; *P. occidentalis*, Night Parrot) and *Cyanoramphus* (green parakeets or kakarikis) also require further study. Christidis and Boles (1994) combined *Geopsittacus* (Night Parrot) with *Pezoporus* based on the mitochondrial DNA sequence study of Leeton *et al.* (1994), and separated *Neopsephotus* from *Neophema* based on the protein allozyme study of Christidis *et al.* (1991). Schodde (1997c) accepted these actions, whereas Collar (1997b) recognised *Neopsephotus,* but kept *Geospittacus* separate.

Here the generic treatment in Christidis and Boles (1994) is retained.

How many species should be recognised in the *Platycercus elegans–flaveolus* complex is a much debated issue. Joseph and Hope (1984), using enzyme electorphoresis, found a close relationship among *elegans* (Crimson Rosella), *flaveolus* (Yellow Rosella) and '*adelaidae*' (Adelaide Rosella), and suggested the possibility of introgression between the last two. Sibley and Monroe (1990) treated *P. elegans* and *P. flaveolus* as separate species and were ambivalent on whether to include *P.* '*adelaidae*' in one of these or to also treat it as a separate species. Forshaw (1981) and Collar (1997b) accepted three species – a treatment at variance with that of most recent authors (Ford 1977, 1987; Christidis and Boles 1994; Schodde 1997c; Dickinson 2003), who combined them (as *P. elegans*). Restriction enzyme analysis of mitochondrial DNA (Ovenden *et al*. 1987) revealed a very close relationship among the three. Here one species is maintained. Crimson Rosella is the currently accepted English name when one species is recognised, but this may require future re-assessment, given its inappropriateness for the yellow form *flaveolus*. Schodde and Tidemann (1986) recommended Blue-cheeked Rosella as an alternate name, but this has not gained popular acceptance. The Tasmanian *Platycercus caledonicus* (Green Rosella) is the sister species to *P. elegans*.

Similar uncertainty surrounds the species limits within the *Platycercus eximius–adscitus–venustus* complex. Most authors (e.g. Forshaw 1981; Sibley and Monroe 1990; Christidis and Boles 1994; Collar 1997b; Juniper and Parr 1998; Dickinson 2003) have recognised three species: *P. eximius* (Eastern Rosella), *P. adscitus* (Pale-headed Rosella) and *P. venustus* (Northern Rosella). Schodde and Tidemann (1986) combined all as one species, but later Schodde (1997c) retained *P. venustus* as separate from the others. There are few published data to assist in defining species limits among these forms. Ovenden *et al*. (1987) identified *P. eximius* and *P. adscitus* as closely related sister clades and *P. venustus* as the most distant. As little new data have appeared since the publication of Christidis and Boles (1994), the treatment of accepting three species is maintained. Nevertheless, a better understanding of the dynamics of the hybrid zone between *P. eximius* and *P. adscitus* may show that these constitute a single species, as advocated by Schodde (1997c). If they are combined, *adscitus* Latham, 1790, is the older name, not *eximius* Shaw, 1792, as used by Schodde (1997c).

According to Schodde (1997c), the *Barnardius zonarius* complex comprises four subspecies: *zonarius* (Port Lincoln Parrot), *semitorquatus* (Twenty-eight Parrot), *macgillivrayi* (Cloncurry Parrot) and *barnardi* (Mallee Ringneck), with *whitei* and *occidentalis* representing intergrading populations. Although Condon (1975), Forshaw (1981), Sibley and Monroe (1990), Collar (1997b) and Juniper and Parr (1998) treated *B. zonarius* (including *semitorquatus*) and *B. barnardi* (including *macgillivrayi*) as separate species, most recent Australian works (e.g. Condon 1975; Christidis and Boles 1994; Schodde 1997c; Johnstone 2001; see also Dickinson 2003) combined them as *B. zonarius*. Extensive introgression was reported by Cain (1955) and Fisher (1970). It had been uncertain whether *macgillivray*i is more closely related to *barnardi* (Forshaw 1981) or to *zonarius* (Ford and Parker 1974), but, using mitochondrial DNA sequences, Joseph and Wilke (2006) demonstrated that this form grouped with *zonarius*. These authors considered it premature to make major changes to the systematics of *Barnardius* pending additional data. Consequently, only one species is recognised here.

Only one species, *Northiella haematogaster* (Blue Bonnet), is generally recognised in this genus, although the small, distinctive southern Western Australian form *narethae* (Naretha Blue Bonnet) has at times been treated as a separate species (e.g. Sindel and Gill 1996). No strong evidence has been published to support the case, but the issue merits further investigation.

Although Forshaw (1981) combined *Psephotus dissimilis* (Hooded Parrot) and *P. chrysopterygius* (Golden-shouldered Parrot), most recent authors have treated the two as separate species (e.g. Sibley and Monroe 1990; Christidis and Boles 1994; Collar 1997b; Schodde 1997c; Juniper and Parr 1998; Dickinson 2003), and this treatment is maintained here.

Peters (1937) and Forshaw (1973) recognised six species in the genus *Cyanoramphus*: *C. unicolor* (Antipodes Parakeet), *C. novaezelandiae* (Red-fronted Parakeet), *C. auriceps* (Yellow-fronted Parakeet), *C. malherbi* (Orange-fronted Parakeet), *C. zealandicus* (Black-fronted Parakeet) and *C. ulietanus* (Society Parakeet). The last two are extinct. *Cyanoramphus auriceps* was further divided into the subspecies *auriceps* and *forbesi*. Peters (1937) recognised nine subspecies in *C. novaezelandiae* (*novaezelandiae*, *aucklandicus*, *chathamensis*, *cyanurus*, *hochstetteri*, *cookii, subflavescens*, *erythrotis* and *saisseti*). Forshaw (1973) and subsequent authors (e.g. Turbott 1990; Collar 1997b; Higgins 1999) combined *aucklandicus* with the nominate subspecies.

According to conventional taxonomy (e.g. Peters 1937; Forshaw 1973), three subspecies of *C. novaezelandiae* occur (or have occurred) in the Australian region: *subflavescens* (Lord Howe Island; extinct), *cookii* (Norfolk Island) and *erythrotis* (Macquarie Island; extinct). McAllan and Bruce (1989) elevated *subflavescens* and *cookii* to species, but presented little supporting evidence for either case. Sibley and Monroe (1990), Juniper and Parr (1998) and Dickinson (2003) recognised *cookii* as a species, while Christidis and Boles (1994), Schodde (1997c) and Collar (1997b) maintained these subspecies as part of *novaezelandiae*.

McAllan and Bruce (1989) designated the new subgenus *Phippsittacus* for *Cyanoramphus cookii*. Schodde (1997c) treated *Phippsittacus* as a *nomen nudum*. He claimed that the diagnosis in McAllan and Bruce (1989) of 'a different bill morphology' was based on Phipps (1981) as its source for information, but no mention of this character was made in the latter publication. While Schodde (1997c) is correct in that Phipps (1981) made no reference to bill morphology, McAllan and Bruce (1989) also referred to a personal communication from G. Phipps in the same citation. If this were their source of information on bill morphology, then the subgenus can be synonymised, but not rejected as a *nomen nudum*.

Boon *et al.* (2000, 2001a, b) examined the taxonomy and systematics of *Cyanoramphus* by analysing DNA sequence data from the mitochondrial control region and cytochrome-*b* gene. In addition to confirming species status for the four extant species recognised by Peters (1937), they also found that both *malherbi* and *forbesi* (Forbes' Parakeet) themselves constituted species.

Their findings most relevant to Australia address the composition of the *C. novaezelandiae* complex and its island populations. The forms *cookii* (Norfolk Island) and *saisetti* (New Caledonia) were found to each represent a separate species and *chathamensis* (Chatham Islands) is a subspecies of *C. novaezelandiae* (New Zealand and offshore islands, Stewart and Auckland Islands). (A specimen thought to represent the extinct *erythrotis* from Macquarie Island was later found to be a mislabelled *hochstetteri* from Antipodes Island; Scofield 2005; Chambers and Boon 2005. The form *hochstetteri* warrants specific recognition.) Although *subflavescens* (Lord Howe Island) and *cyanurus* (Kermadec Islands) were not examined, Boon *et al.* (2001a, b) recommended that these be retained as subspecies of *C. novaezelandiae*. The occurrence of several taxa that are shared by Lord Howe Island and Norfolk Island, but absent from New Zealand (e.g. Tasman Starling *Aplornis fusca*, Island Thrush *Turdus poliocephalus*, Golden Whistler *Pachycephala pectoralis*) suggests that on biogeographical grounds, it is more likely that *subflavescens* is more closely related to *cookii* than to *novaezelandiae*. While such analogous distributions are not definitive indications of relationships, they are useful in the absence of other information. Lord Howe *subflavescens* can be regarded as either conspecific with *cookii* or a distinct species. Although the last alternative makes fewer assumptions about its affinities, the more conservative treatment – that it and *cookii* are conspecific – is more prudent at this time. Clearly the taxonomic status and affinities of *subflavescens* and *cyanurus* need to be resolved.

Also unrepresented in the studies of Boon *et al.* (2000, 2001a, b) was *erythrotis* (Macquarie Island). Oliver (1955) commented that this form was very close to, and could probably be combined with, *hochstetteri*. In recent lists *erythrotis*, together with *hochstetteri*, has been treated as a subspecies of *novaezelandiae*. Given the rearrangements among the other forms conventionally placed in *novaezelandiae*, the retention of *erythrotis* as a subspecies of that species is of uncertain validity. Nonetheless, this seems preferable to elevating it to specific level in the absence of relevant data. Combining it with *hochstetteri* is also possible, but this action has no more support than the conventional treatment.

Boon *et al.* (2001a, b) identified *C. saisetti*, *C. forbesi* and *C. cookii* as the more basally diverging lineages among those taxa included in the study (*C. zealandicus* and *C. ulietanus* were not examined), and recovered *C. novaezelandiae* and *C. malherbi* as sister species. Thus, *C. novaezelandiae* as traditionally delimited not only comprises several species, but is a paraphyletic assemblage. The subgeneric divisions suggested by McAllan and Bruce (1989) merit further investigation.

Based on the preceding discussion, at least two species occur within the Australian region: *C. cookii* (G. R. Gray, 1859) (including *subflavescens* Salvadori, 1891) and *C. novaezelandiae* (Sparrman, 1787). The names Norfolk Island Parakeet (for *cookii*) and Lord Howe Island Parakeet (for *subflavescens*) are not applicable to *C. cookii* (*sensu lato*) as defined here, because both islands are in its distribution. A suitable name is Tasman Parakeet. The qualifier 'Tasman' is used for the Tasman Starling (*Aplornis fusca*), which also occurred on both island groups. Boon *et al.* (2001b) included 'Red-crowned' in the names of the species elevated from the original *C. novaezelandiae* complex, but this is unnecessary and probably inappropriate, given that it does not form a monophyletic assemblage. Other group names that have been used for *Cyanoramphus* species are kakarikis and green parakeets (e.g. Boon *et al.* 2001a).

The sequence of taxa follows that used in Christidis and Boles (1994), other than that *Cyclopsitta* is shifted to follow the lorikeets.

Trichoglossus haematodus	Rainbow Lorikeet
Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet
Psitteuteles versicolor	Varied Lorikeet
Glossopsitta concinna	Musk Lorikeet
Glossopsitta pusilla	Little Lorikeet
Glossopsitta porphyrocephala	Purple-crowned Lorikeet
Cyclopsitta diophthalma	Double-eyed Fig-Parrot
Eclectus roratus	Eclectus Parrot
Geoffroyus geoffroyi	Red-cheeked Parrot
Alisterus scapularis	Australian King-Parrot
Aprosmictus erythropterus	Red-winged Parrot
Polytelis swainsonii	Superb Parrot
Polytelis anthopeplus	Regent Parrot
Polytelis alexandrae	Princess Parrot
Platycercus caledonicus	Green Rosella
Platycercus elegans	Crimson Rosella
Platycercus eximius	Eastern Rosella
Platycercus adscitus	Pale-headed Rosella
Platycercus venustus	Northern Rosella
Platycercus icterotis	Western Rosella
Barnardius zonarius	Australian Ringneck
Purpureicephalus spurius	Red-capped Parrot
Northiella haematogaster	Blue Bonnet
Lathamus discolor	Swift Parrot
Psephotus haematonotus	Red-rumped Parrot
Psephotus varius	Mulga Parrot
Psephotus chrysopterygius	Golden-shouldered Parrot
Psephotus dissimilis	Hooded Parrot
Psephotus pulcherrimus	Paradise Parrot^{E}
Cyanoramphus cookii	Tasman Parakeet$^{LH/E,N}$
Cyanoramphus novaezelandiae	Red-crowned Parakeet$^{M/E}$
Melopsittacus undulatus	Budgerigar
Neopsephotus bourkii	Bourke's Parrot
Neophema chrysostoma	Blue-winged Parrot
Neophema elegans	Elegant Parrot

Neophema petrophila	Rock Parrot
Neophema chrysogaster	Orange-bellied Parrot
Neophema pulchella	Turquoise Parrot
Neophema splendida	Scarlet-chested Parrot
Pezoporus wallicus	Ground Parrot
Pezoporus occidentalis	Night Parrot

ORDER CUCULIFORMES

The emerging picture from the available data is that the circumscription of the Cuculiformes should be confined to the cuckoos and allies, and should exclude the Hoatzin and the Musophagidae. Within this delimitation, there remains uncertainty as to the number of families or subfamilies to recognise. Peters (1940) admitted only a single family, whereas Sibley and Monroe (1990) adopted five families of cuckoo, excluding the Hoatzin. Payne (1997) accepted a single family, comprising six subfamilies:

(1) Cuculinae (Old World parasitic cuckoos)
(2) Centropodinae (coucals)
(3) Phaenicophaeinae (Malagasy couas and Asian malkohas)
(4) Coccyzinae (American cuckoos)
(5) Neomorphinae (New World ground-cuckoos)
(6) Crotophaginae (anis).

These subfamilies corresponded to the families of Sibley and Monroe (1990), except that those authors included the couas and the malkohas in the same family as the Old World parasitic cuckoos. Johnson *et al.* (2000) analysed sequence data from the mitochondrial cytochrome-*b* and ND2 genes to examine relationships within the Cuculidae (*sensu lato*). They found strong evidence to support the six subfamilies recognised by Payne (1997), although they had limited generic sampling from most of these. No close association between the Old World parasitic cuckoos and the couas was found (malkohas were not included in their study). The treatment in Mason (1997) is consistent with that of Payne (1997), except for Mason's elevation of the Cuculinae and Centropodinae to family level, as was done by Christidis and Boles (1994), albeit tentatively.

A sister relationship between the Cuculinae and Coccyzinae was found by Hughes (1996, behaviour, ecology; 2000, osteology), Hughes and Baker (1999, sequences of 1 nuclear and 6 mitochondrial genes) and Johnson *et al.* (2000), although not by Aragón *et al.* (1999), despite examining the same two genes as Johnson *et al.* (2000). Hughes (2000) linked the Afro-Asian *Clamator* (crested cuckoos) with the New World *Coccyzus* (spotted-tailed cuckoos), whereas Aragón *et al.* (1999) associated *Clamator* with the Asian *Phaenicophaeus* (malkohas). Sorenson and Payne (2005) confirmed that the three genera were part of the same cluster, which was related to the Cuculinae (*sensu* Peters 1940).

In their DNA–DNA hybridisation study, Sibley and Ahlquist (1990) identified a sister relationship between the Cuculinae and Centropodinae, whereas Johnson *et al.* (2000) recovered the Centropodinae as one of the more basal lineages in the order. Hughes (2000) obtained a sister relationship between *Coua* (couas) and *Centropus* (coucals) and found no association between the couas and malkohas.

Sorenson and Payne (2005), in the most extensive molecular study to date, used mitochondrial ND2 and 12S gene sequences for about 140 species of cuckoo. They obtained strong support for the monophyly of the five main lineages, which they recognised as subfamilies. The Crotophaginae and Neomorphinae formed a group with a sister lineage to the remaining cuckoos. The couas were distinct from the malkhoas and formed a clade with the Centropodinae; together these are the sister taxon of the Cuculinae. The Cuculinae consisted of two tribes: the Phaenocophaeni and the Cuculini. Species usually placed in the Coccyzinae were part of the Phaenocophaeni. Although a case can be made for maintaining the five lineages as families, Sorenson and Payne (2005) accepted a single, enlarged family (*contra* Sibley and Monroe 1990) and this is followed here. The

Centropodidae, treated at family level by Christidis and Boles (1994), Inskipp *et al.* (1996) and Mason (1997), are maintained here as a subfamily of the Cuculidae.

Family Cuculidae

Among the coucals, the Australian species *Centropus phasianinus* (Pheasant Coucal) is closest to *C. bernsteini* (Lesser Black Coucal; New Guinea) and *C. violaceus* (Violet Coucal; Bismarck Archipelago) (Sorenson and Payne 2005).

Within the Cuculinae (*sensu stricto*), both Johnson *et al.* (2000) and Hughes (1996) identified a monophyletic clade comprising *Cacomantis* (Asian–Australasian cuckoos), *Cuculus* (typical cuckoos), *Chrysococcyx* (bronze-cuckoos), *Eudynamys* (including *Urodynamis*; koels) and *Scythrops* (Channel-billed Cuckoo). Aragón *et al.* (1999) did not include the last two genera in their study, but recovered *Cacomantis*, *Cuculus* and *Chrysococcyx* as a monophyletic clade.

Both DNA sequence analyses (Johnson *et al.* 2000) and behavioural and ecological studies (Hughes 1996) supported a sister relationship between *Eudynamys* and *Scythrops*. McAllan and Bruce (1986) used *Urodynamis taitensis* for the Long-tailed Koel, but the recent practice has been to include this species in the genus *Eudynamys* (Sibley and Monroe 1990; Christidis and Boles 1994; Mason 1997; Payne 1997; Holdaway *et al.* 2001). *Urodynamis* was not included in the studies of Hughes (1996), Hughes and Baker (1999) or Johnson *et al.* (2000). Sorenson and Payne (2005) did not recover these conventional relationships between *Eudynamys*, *Urodynamis* and *Scythops*. In that analysis, *Eudynamys* was part of a basal lineage that also includes *Microdynamis parva* (Dwarf Koel; New Guinea) and *Pachycoccyx audeberti* (Thick-billed Cuckoo; Africa). *Urodynamis* was found to be distinct from *Eudynamys* and was the sister genus to *Scythrops*. Together they form the next clade that diverged. These relationships warrant further investigation, but here Sorenson and Payne (2005) are followed in separating *Urodynamis* from *Eudynamys*.

Taxonomy of the bronze-cuckoos *Chrysococcyx* (*sensu lato*) is still poorly understood. Hartert and Stresemann (1925) and Peters (1940) recognised three genera:

(1) *Misocalius* (*osculans*; Black-eared Cuckoo)
(2) *Chrysococcyx* (*flavigularis*, Yellow-throated Cuckoo; *klaas*, Klaas's Cuckoo; *cupreus*, African Emerald Cuckoo; *caprius*, Diederik Cuckoo)
(3) *Chalcites* (*maculatus,* Asian Emerald Cuckoo; *xanthorhynchus*, Violet Cuckoo; *basalis*, Horsfield's Bronze-Cuckoo; *minutillus* (as *malayanus*), Little Bronze-Cuckoo; *lucidus*, Shining Bronze-Cuckoo; *ruficollis*, Rufous-throated Bronze-Cuckoo; and *meyerii*, White-eared Bronze-Cuckoo).

Berger (1955) combined all three nominal genera in *Chrysococcyx*, as did Friedmann (1968), and while it has been acknowledged that such treatment was probably too radical, most works have followed this (e.g. Condon 1975; Sibley and Monroe 1990; Christidis and Boles 1994; Payne 1997; Dickinson 2003). After assessing plumage patterns, Marchant (1972) identified three lineages among the bronze-cuckoos, although he did not separate these generically:

(1) *flavigularis*, *klaas*, *cupreus*, *caprius*, *maculatus*, *xanthorhynchus* (Afro-Asian distribution)
(2) *basalis*, *minutillus*, *lucidus*, *ruficollis*, *meyerii* (Australo-Asian distribution)
(3) *osculans* (Australia).

This arrangement differed from that of Hartert and Stresemann (1925) and Peters (1940) in that it aligned *maculatus* and *xanthorhynchus* with the members of *Chalcites*. Marchant (1972) argued that *osculans* was probably the sister species to the other species of *Chrysococcyx* and noted similarities between it and *Cacomantis*. Mason (1997) followed Wolters (1975–1982) in treating lineage (1) as *Chrysococcyx* and combining lineages (2) and (3) under *Chalcites*. In a detailed osteological study, Hughes (2000) obtained a sister relationship between *Misocalius osculans* and *Chalcites* relative to *Chrysococcyx* and concluded that the data supported the merger of *Chrysococcyx*, *Chalcites* and *Misocalius*.

Mitochondrial sequence data indicate that the bronze-cuckoos fall into two well-separated clades (Sorenson and Payne 2005): a primarily African one, which also includes *maculatus* and *xanthorhynchus*, and a mainly Australo-Papuan one. Sorenson and Payne (2005) maintained a single genus for all the bronze-cuckoos, but the degree of differentiation between the two clades indicates that these could be each treated at generic level. Here, Mason (1997) is followed in placing the Australo-Papuan taxa in *Chalcites*. This includes *osculans* and, following Sorenson and Payne (2005), the New Guinea species *megarhynchus* (Long-billed Cuckoo), which is usually placed in the monotypic genus *Rhamphomantis*. Joseph *et al.* (2002) also adopted *Chalcites* for the Australian birds.

Some authors (e.g. Condon 1975; White and Bruce 1986) have treated *Cuculus* and *Cacomantis* together as a single genus, but most recent classifications have accepted both. Jones and Gibbs (1997) sequenced a small section of the mitochondrial ND6 gene of one representative of *Cuculus* and two of *Cacomantis*. They found that on genetic distances, *Cacomantis flabelliformis* (Fan-tailed Cuckoo) was closer to *Cuculus canorus* (Common Cuckoo) than to *Cacomantis sepulcralis* (Rusty-breasted Cuckoo; Philippines, Malay Archipelago, western Indonesia). However, the more comprehensive DNA study of Johnson *et al.* (2000) identified a monophyletic clade comprising *Cacomantis flabelliformis*, *C. merulinus* (Plaintive Cuckoo) and *C. variolosus* (Brush Cuckoo) with respect to *Cercococcyx* (long-tailed cuckoos) and *Cuculus* (*fugax*, *saturatus* and *vagans*). Similarly, in the study by Aragón *et al.* (1999), *C. flabelliformis* was a sister species to the clade containing *Cercococcyx*, *Surniculus* (drongo cuckoos) and *Cuculus* (*canorus*, *poliocephalus*). Payne (2005) retained *Cacomantis* and *Cuculus* as separate genera, based on Sorenson and Payne (2005). This separation, plus the inclusion of *flabelliformis* in *Cacomantis*, are supported by the published DNA sequence data.

The position of *pallidus* (Pallid Cuckoo) has been unsettled, with Mayr (1964) considering it a 'perfect intermediate' between *Cuculus* and *Cacomantis*. It has been conventionally included in *Cuculus* (e.g. Condon 1975, Christidis and Boles 1994, Mason 1997, Dickinson 2003), although Wolters (1975–82) removed it to the monotypic genus *Heteroscenes*. The analysis of Sorenson and Payne (2005) found that this species is well separated from *Cuculus* (*sensu stricto*). Its closest relative is White-capped Koel (New Guinea), usually placed in a monotypic genus as *Caliechthrus leucolophus*, and together these form the sister taxon of *Cacomantis*. Whether it is preferable to expand the definition of *Cacomantis* to include *pallidus–leucolophus* or allocate them to their own genus is debatable. If segregated generically, the applicable name is either *Heteroscenes* Cabanis and Heine, 1863 (type species *pallidus*) or *Caliechthrus* Cabanis and Heine, 1863 (type species *leucolophus*). Both names appeared in the same publication and have equal priority. Generic separation may prove to be the best option but, for now, both species are placed in *Cacomantis*, but should be distinguished subgenerically.

Cacomantis castaneiventris (Chestnut-breasted Cuckoo) and *C. flabelliformis*, which are traditionally considered to be closely related, were confirmed as sister species by Sorenson and Payne (2005). Use of *Cacomantis flabelliformis* Latham, 1802, for Australian birds rather than *C. pyrrhophanus* (Vieillot, 1817) follows Mason (1982).

According to Hartert (1925) and Peters (1940), *Cacomantis variolosus* ranges from the Philippines, Malay Archipelago Indonesia and Australasia. Based on a consideration of plumage patterns, White and Bruce (1986) argued that this complex comprised two species *C. sepulcralis* (Philippines, Malay Archipelago, western Indonesia) and *C. variolosus* (eastern Indonesia, Australasia). Several subsequent authors, such as Sibley and Monroe (1990), Andrew (1992), Inskipp *et al.* (1996), Coates and Bishop (1997) and

Rogers (1999b), have followed this. Others such as Mason (1997) and Payne (1997) have continued to recognise only *C. variolosus*. Although Christidis and Boles (1994) did not comment, they adopted the treatment of Condon (1975), who followed Peters (1940).

There is no agreement about the relationships within the *C. variolosus* complex, particularly whether *C. variolosus* and *C. sepulcralis* are distinct species and, if so, what the delimitation is between them. Payne (1997) included the subspecies *infaustus* (eastern Moluccas through to New Guinea) in the *sepulcralis* group, whereas White and Bruce (1986) aligned it with the *variolosus* group and argued that *C. sepulcralis* was more closely related to *C. merulinus* (Plaintive Cuckoo; south-east Asia) than to *C. variolosus*. (Johnson *et al.* [2000] recorded extremely close genetic distances between *C. merulinus* and *C. sepulcralis* [listed as a population of *C. variolosus*]; however, the specimen of *C. merulinus* was misidentified – its correct identification as *sepulcralis* being made subsequently by Payne and Sorenson [2003] after examination of the voucher.) According to Bishop (in Inskipp *et al.* 1996: p. 47), *C. variolosus* and *C. sepulcralis* are sympatric in Sulawesi and have differing calls. Dickinson (2003) included *sepulcralis* as a subspecies of *variolosus*, following a personal communication from R.B. Payne. Lei *et al.* (2003) compared the vocalisations of *C. merulinus*, *C. variolosus* and related forms using qualitative and quantitative assessment of sonograms. Based on song similarities, these authors concluded that *sepulcralis* was conspecific with *C. variolosus* and *passerinus* with *C. merulinus*. Sorenson and Payne (2005) included *variolosus* (sample from Queensland), *sepulcralis* (samples from Philippines and Borneo) and '*heinrichi*' (Bacan, Indonesia; a rufous morph not regarded as distinct subspecies) in their analyses and found that these clustered together as the sister group to the closely related pair, *C. merulinus* and *C. passerinus*. The resolution of this does not affect the Australian birds directly, for which the treatment adopted by Christidis and Boles (1994) is retained. It is likely, however, that changes within the complex will be warranted once the inter-relationships of its members are further clarified.

The larger species with barred underparts, traditionally combined in *Cuculus*, were found by Sorenson and Payne (2005) to fall into two clades, which these authors recognised generically: *Cuculus* (typical barred cuckoos, e.g. *canorus*, *saturatus*) and *Hiercoccyx* (hawk cuckoos, e.g. *sparverioides*, *fugax*).

When Christidis and Boles (1994) was compiled, conventional treatment was to regard *Cuculus saturatus* (Oriental Cuckoo) as a wide ranging species with three subspecies. Australian birds were referred to the subspecies *optatus*, which breeds across northern Eurasia. Payne (2005) explained that *optatus* Gould, 1845, was valid and thus has priority over *horsfieldii* Moore, 1857, which was used by other authors. Subsequently, Payne (1997, 2005) and King (2005) recommended that each of the subspecies be recognised at specific level, mainly because of differences in vocalisations. This division is accepted here, with the name Oriental Cuckoo being applied to *C. optatus*. The restricted *C. saturatus* (breeding Himalayas and southern Asia) takes the name Himalayan Cuckoo. The third form, *C. lepidus* of Malaya and Sunda Islands, is the Sunda Cuckoo.

Cuculus optatus and *C. saturatus* are identical in plumage, but differ in size – the former is larger – with minimal overlap in wing length. Mason (1997) pointed out that Australian specimens fell within the size range of *optatus*. This was confirmed by Rogers (1999c), with the exception of two birds that agreed more closely in size with *saturatus*. It is unlikely that the latter specimens can be identified with confidence, but they raise the possibility that both species occur in Australia. Pending further confirmation, *C. optatus* is listed for Australia and *C. saturatus* is placed on the supplementary list. Birds belonging to the *C. optatus/saturatus* group have been recorded from Christmas Island, but a more specific identification has not been possible (Johnstone and Darnell 2004a).

Parker (1981) demonstrated that C. *minutillus* is the correct name for the Little Bronze-Cuckoo, as the type specimen on which *C. malayanus* was based is a female *C. xanthorhynchus*. Relationships within this complex are poorly understood. Hartert and Stresemann (1925) recognised only one species while Peters (1940) accepted two: *C. malayanus* (= *minutillus*) and *C. crassirostris* (Pied Bronze-Cuckoo). Parker (1981) maintained five species:

(1) *C. minutillus* (Little Bronze-Cuckoo; south-east Asia, Indonesia, Australia)
(2) *C. russatus* (Gould's Bronze-Cuckoo; Malay Archipelago, Philippines, Australasia)
(3) *C. rufomerus* (Green-cheeked Bronze-Cuckoo; Lesser Sundas)
(4) *C. crassirostris* (Pied Bronze-Cuckoo; eastern Indonesia)
(5) *C. ruficollis* (Rufous-throated Bronze-Cuckoo; New Guinea).

White and Bruce (1986), Sibley and Monroe (1990), Andrew (1992) and Inskipp *et al.* (1996) accepted this treatment. Ford (1981a) combined all the forms as one species, but was tentative regarding the inclusion of *crassirostris* with the others. Christidis and Boles (1994) accepted *C. russatus* and *C. minutillus* as separate species, but made no mention of *C. rufomerus* and *C. crassirostris*. Mason (1997) and Payne (1997) recognised a single species in the complex – *russatus* was regarded as a subspecies of *minutillus* – thus, under this classification, only one species occurs in Australia. Rogers (1999d) noted that there is considerable plumage variation among individuals owing to hybridisation between forms. Dickinson (2003) retained *C. crassirostris* as a species and placed all other forms in *C. minutillus*, and synonymising *russatus* with subspecies *poecilurus* (Seram, New Guinea, north-east Queensland) based on a personal communication from R.B. Payne. Payne (2005) detailed the reasons for this action, noting that these were not separable on plumage. He also included *crassirostris* as a subspecies of *minutillus*.

The main basis for splitting *minutillus* and *russatus* was Parker's (1981) discovery of specimens of *minutillus cleis* and *russatus aheneus* collected in Borneo from the same locality and in the same month. Other authors gave greater weight to the extensive hybridisation in north Queensland (Ford 1981a) and so treated these as a single species. There remain several aspects that need to be resolved before a definitive answer is achieved. Evidence of sympatry is based on few specimens, and it is has not been documented that both forms actually breed in north Queensland. The presence of migratory and resident populations confounds the issue, with the nature of their interactions throughout Wallacea poorly understood (Rogers 1999e). The conclusions of Payne (2005) are accepted here – with the Australian populations treated as a single species – while emphasising the need for further work on this complex.

Australian and New Zealand breeding populations of *Chalcites lucidus* were formerly treated as two species: *lucidus* (Shining Bronze-Cuckoo; New Zealand) and *plagosus* (Golden Bronze-Cuckoo; Australia). More recently treatment has been to recognise a single species. Gill (1983b) went further by proposing that no subspecies should be maintained in Australia–New Zealand, largely on the basis of what he believed to be clinal variation from narrow-billed Western Australian birds to broad-billed ones in New Zealand. Since then Rogers (1999f) showed that, although western birds have narrower bills than those in eastern Australia, variation in bill width does not appear to be clinal. Moreover, there are consistent, non-clinal, plumage differences between *lucidus* and *plagosus*. There is scope for a genetic investigation on the degree of isolation between these forms.

As recovered by Sorenson and Payne (2005), *Chalcites* incorporates *Rhamphomantis megarhynchus*, which has a sister relationship to the remaining species. The next lineage to diverge was C. *basalis*, followed by *C. osculans*, thus confirming that *osculans* is closely related to the other Australo-Papuan bronze-cuckoos. The species pair of *C. lucidus* and *C. ruficollis* was next and then the sister species *C. minutillus* and *C. meyeri*.

The systematics of the koels *Eudynamys* (*sensu stricto*) complex continue to be debated. Peters (1940) followed Hartert (1903) in recognising a single species that ranged from southern Asia through to Australia. (Note that *Eudynamys* is masculine and the specific epithets must change accordingly; David and Gosselin 2002b.) White and Bruce (1986) divided the complex into three species based on patterns of brood parasitism and female plumage: *E. scolopaceus* (Asian Koel; India, southern China, south-east Asia, Philippines, northern and southern Moluccas, western Lesser Sundas); *E. cyanocephalus* (Australian Koel; eastern Lesser Sundas, Australia, New Guinea, northern Melanesia); and *E. melanorhynchus* (Black-billed Koel; Sulawesi, Sula). These authors suggested that, based on juvenile plumage characters, the form from the southern Moluccas (*orientalis*) might best be considered to belong with *E. cyanocephalus,* and not *E. scolopaceus*. They also noted that the resident New Guinean populations of *E. cyanocephalus* (*rufiventer*) could, instead, be a form of *E. scolopaceus*. Sibley and Monroe (1990) accepted the treatment of White and Bruce (1986), except for including New Guinean *rufiventer* in *E. scolopaceus*. Andrew (1992) and Inskipp *et al.* (1996) followed White and Bruce (1986), while Payne (1997) continued to recognise only one species. Christidis and Boles (1994) followed the conventional treatment of retaining one species pending further clarification of distributional limits of the proposed species. Mason (1997) accepted three species, but included the resident forms of the northern and southern Moluccas (*corvinus* and *orientalis*, respectively), together with those of the eastern Lesser Sundas, northern Melanesia, New Guinea and Australia, as one species. Representatives of four named populations of *Eudynamys* were included in the study by Sorenson and Payne (2005): *cyanocephalus* (samples from New South Wales and Queensland), *alberti* (often included in *cyanocephalus*; Solomon Islands), *melanorhynchus* (Sulawesi) and *scolopaceus* (India). The first divergence among these was *scolopaceus*, and *cyanocephalus* and *alberti* formed a very close pair.

The treatment proposed by Mason (1997) is followed here. Under this division, the oldest available name for the species occurring in Australia is *orientalis* Linnaeus, 1766, which has priority over *E. cyanocephalus* Latham, 1802. This necessitates the introduction of a new English name for *E. orientalis*. Mason (1997) used the name Pacific Koel, but, as the species occurs throughout eastern Indonesia, the Moluccas, New Guinea, northern Melanesia and Australia, Eastern Koel is a more appropriate name. Consequently the three species in the *E. scolopaceus* complex as recognised here are *E. orientalis* (Eastern Koel), *E. scolopaceus* (Asian Koel; southern Asia through to the Lesser Sundas and Philippines), and E. *melanorhynchus* (Black-billed Koel; Sulawesi, Sula).

Three cuckoos have been added to the list as vagrants since Christidis and Boles (1994): *E. scolopaceus* (Asian Koel) from Christmas Island (BARC 436), *Hierococcyx sparverioides* (Large Hawk-Cuckoo), also from Christmas Island (Dooley 2006a; BARC 494), and *Centropus bengalensis* (Lesser Coucal) from Ashmore Reef (Dooley 2006a; BARC 484). Johnstone and Darnell (2004a) cited an unsubstantiated record of *Surniculus lugubris* (Asian Drongo-Cuckoo) from Christmas Island, on which basis this species is placed on the supplementary list.

The sequence of genera and species follows Payne (2005), based on Sorenson and Payne (2005).

Centropus bengalensis	Lesser Coucal$^{A/V}$
Centropus phasianinus	Pheasant Coucal
Eudynamys scolopaceus	Asian Koel$^{C/V}$
Eudynamys orientalis	Eastern Koel
Urodynamys taitensis	Long-tailed Cuckoo^{LH,N}
Scythrops novaehollandiae	Channel-billed Cuckoo

Chalcites basalis	Horsfield's Bronze-Cuckoo
Chalcites osculans	Black-eared Cuckoo
Chalcites lucidus	Shining Bronze-Cuckoo
Chalcites minutillus	Little Bronze-Cuckoo
Cacomantis pallidus	Pallid Cuckoo
Cacomantis castaneiventris	Chestnut-breasted Cuckoo
Cacomantis flabelliformis	Fan-tailed Cuckoo
Cacomantis variolosus	Brush Cuckoo
Surniculus lugubris	Asian Drongo-Cuckoo$^{S(C)}$
Cuculus optatus	Oriental Cuckoo
Cuculus saturatus	Himalayan Cuckoo^{S}
Hierococcyx sparverioides	Large Hawk-Cuckoo$^{C/V}$

ORDER STRIGIFORMES

Distinct separation between the Tytonidae (barn owls and allies) and Strigidae (typical owls) is well supported in analyses based on mitochondrial DNA sequence data (Mindell *et al.* 1997; Wink and Heidrich 1999). These are best treated as two families.

Family Strigidae

The Strigidae are sometimes split into two subfamilies: the Striginae and Buboninae (e.g. Peters 1940; Schodde 1997d). The Striginae comprise *Strix*, *Asio*, *Pseudoscops*, *Nesasio* and *Aegolius*, with the Buboninae containing the remaining genera, including *Ninox*. Sibley and Ahlquist (1990) and Mindell *et al.* (1997) examined the relationships of some genera of Strigidae using DNA–DNA hybridisation and mitochondrial DNA sequences, respectively. Neither study provided support for the recognition of these two subfamilies as delimited. In a more comprehensive study based on cytochrome-*b* DNA sequences, Wink and Heidrich (1999) also failed to recover monophyletic assemblages corresponding to the Striginae and Buboninae. In their analyses, two clades were consistently evident: (1) *Aegolius*, *Athene*, *Glaucidium* and *Surnia*, and (2) *Bubo*, *Strix*, *Pulsatrix*, *Otus* and *Asio*. These assemblages were consistent with the results of Sibley and Ahlquist (1990) and Mindell *et al.* (1997). Wink and Heidrich (1999) did not unequivocally resolve the position of *Ninox*. It was placed as either a sister group to the *Bubo–Strix* assemblage or to the *Aegolius–Athene–Glaucidium–Surnia* complex. These authors argued that the latter association was better supported by the data, and Mindell *et al.* (1997) also linked *Ninox* with *Aegolius* (they did not examine *Athene* or *Glaucidium*). There is thus molecular support for linking *Ninox* with the *Aegolius–Athene–Glaucidium–Surnia* group. This is largely consistent with the generic sequence in Sibley and Monroe (1990) and discussion in Schodde (1997d).

The DNA-sequence-based phylogeny of Wink and Heidrich (1999) was largely consistent with the treatment in Ford's (1967) PhD thesis. Although never formally published, Ford's results were described and followed by Marks *et al.* (1999). Ford (1967) divided the Strigidae into three subfamilies:

(1) Striginae, containing the tribes Otini (*Otus*, *Pyrroglaux*, *Gymnoglaux*, *Ptilopsis*, *Mimizuku*), Strigini (*Strix*, *Jubula*, *Lophostrix*, *Pulsatrix*) and Bubonini (*Bubo*, *Ketupa*, *Nyctea*, *Scotopelia*)
(2) Suriniinae, with tribes Aegolini (*Aegolius*), Surniini (*Surnia*, *Glaucidium*, *Xenoglaux*, *Microathene*, *Athene*) and Ninoxini (*Ninox*, *Uroglaux*, *Sceloglaux*)
(3) Asioninae (*Pseudoscops*, *Asio*, *Nesasio*).

Wink *et al.* (2004c) showed *Micrathene whitneyi* (Elf Owl; south-west North America) as the sister species to *Ninox*, and this group as the sister clade to *Asio*. According to the DNA data (Wink and Heidrich 1999), however, Old World *Otus* is unrelated to New World *Otus* and occupies a basal position within the Strigidae. Further phylogenetic work on the Strigidae is clearly warranted, but some patterns of relationships are becoming better resolved. Of relevance to Australia and the surrounding region is phylogenetic information relating to *Ninox* and allied genera.

Schodde and Mason (1981) and Schodde (1997d) recognised three groups within

Ninox (hawk-owls): (1) *strenua* (Powerful Owl) and *N. rufa* (Rufous Owl); (2) *connivens* (Barking Owl); and (3) *novaeseelandiae* (Southern Boobook) and remaining species. Schodde and Mason (1981) included *Uroglaux dimorpha* (Papuan Hawk-Owl) in *Ninox* and suggested that it was most closely linked to *N. strenua* and *N. rufa*, although later Schodde (1997d) cast doubt on this treatment. Schodde (1997d) treated the three groups in *Ninox* as subgenera: *Rhabdoglaux*, *Hieracoglaux* and *Ninox*, respectively. Norman *et al.* (1998a) obtained genetic distances from DNA sequences of the mitochondrial ND2 gene for Australian members of *Ninox*. They found that *N. rufa* and *N. strenua* differed from each other by 5.4% sequence divergence and by around 8.3% from other Australian species. Comparisons of distances involving *N. connivens*, *N. novaeseelandiae* and *N. natalis* (see below for discussion on species treatment) clustered at around 3.5–4.5%. The genetic data support the recognition of a subgenus for *N. strenua* and *N. rufa* (*Rhabdoglaux*), but not a monotypic one for *N. connivens* (*Hieracoglaux*).

Wink *et al.* (2004c) combined data on *N. scutulata* (Brown Hawk-Owl) with those of Norman *et al.* (1998a) for Australian taxa and those of Olsen *et al.* (2002) on the recently described *N. sumbaensis* (Little Sumba Hawk-Owl). They found that, within this limited taxonomic representation, *N. strenua* grouped with *N. rufa* and *N. novaeseelandiae* with *N. connivens*. Clustering with the latter pair was *N. sumbaensis*, and *N. scutulata* was the sister species to the other five species. Further coverage of extralimital taxa is required to determine the number and the composition of subgenera that could be recognised within *Ninox* and the relationships among these.

Schodde (1997d) treated Australian and New Zealand forms of the boobook owl complex as two species: *Ninox boobook* (Southern Boobook; Australia) and *N. novaeseelandiae* (Morepork; New Zealand), following Schodde and Mason (1981), with the forms on Lord Howe (*albaria*) and Norfolk (*undulata*) Islands in *novaeseelandiae*. This treatment was followed by König *et al.* (1999). Norman *et al.* (1998a, b) examined relationships in this complex and, based on genetic distances, argued that all the forms were best treated as a single species. Similarly, based on a morphological examination of the complex in the Timor region, Johnstone and Darnell (1997) felt it better to recognise only one species. The treatment in Schodde (1997d) presumed that the populations in Australia and those in the Timor region comprise a monophyletic assemblage relative to those in New Zealand and Norfolk and Lord Howe Islands. There is no *a priori* reason to assume this. In the absence of more supporting evidence for that proposal, Norman *et al.* (1998a, b) is followed here by treating *N. novaeseelandiae-boobook* as one species. Following Mees (1964), *Ninox rudolphi* (Sumba Boobook) is kept separate, as is the current convention (Sibley and Monroe 1990; Olsen 1999; König *et al.* 1999). Although the DNA evidence indicates that Australian and New Zealand forms are best treated as conspecific, it is possible that other forms of the complex in the Timor region could prove to be a separate species. The form in the Australian Wet Tropics (*lurida*) is often mooted as a possible separate species (Schodde and Mason 1981; König *et al.* 1999). DNA sequence data are required to resolve these issues.

It is important to correct two major misquotations in the literature of the findings of Norman *et al.* (1998b). Olsen (1999) stated that molecular data of Norman *et al.* (1998b) supported the separation of *boobook* and *novaeseelandiae* as separate species and the inclusion of Tasmanian *leucopsis* in the latter. Higgins (1999) stated that Norman *et al.* (1998b) concluded that *novaeseelandiae*, *undulata* and *leucopsis* formed a group separate from those of mainland Australia. Both statements are in error. Norman *et al.* (1998b) did not present data on Australian mainland *boobook*. Instead they included *leucopsis* as a representative of the Australian forms for comparisons with extralimital forms.

The hawk-owl on Christmas Island (*natalis*) was described at species level by Lister (1889). Chasen (1933) subsequently placed it as a subspecies of *forbesi*. More recently, both forms, and other members of the *N. squamipila* (Moluccan Hawk-Owl) complex have been treated as a single species (e.g. Peters 1940; Sibley and Monroe 1990; Christidis and Boles 1994; Schodde 1997d). This comprises five nominal forms: *squamipila* (Seram), *hypogramma* (Halmahera, Ternate, Bacan), *hantu* (Buru), *forbesi* (Tanimbar) and *natalis* . Norman *et al.* (1998a) examined the taxonomy of nominate *squamipila*, *hypogramma* and *natalis*. Their analyses indicated that the three forms did not form a monophyletic group relative to *N. connivens* and *N. novaeseelandiae* (*sensu lato*). These authors concluded that, from genetic distances and tree topography, at least three species should be recognised in the complex: *N. natalis*, *N. hypogramma*, and *N. squamipila*, with *hantu* and *forbesi* tentatively included in *N. squamipila*. Although later authors (e.g. Olsen 1999; König *et al.*1999) accepted species status for *N. natalis*, they retained *hypogramma* in *N. squamipila*. For consistency, each should be treated as separate species, using Northern Moluccan Hawk-Owl for *N. hypogramma* and Southern Moluccan Hawk-Owl for *N. squamipila*. Christmas Island Hawk-Owl is preferred for *N. natalis* (Norman *et al.* 1998a; Higgins 1999; König *et al.* 1999), rather than Christmas Hawk-Owl (Olsen 1999).

Ninox scutulata is included as a vagrant from Ashmore Reef (Schodde and van Tets 1981) and Western Australia and on a Timor Sea oil rig (Johnstone and Storr 1998). Christidis and Boles (1994) placed the record of *Ketupa ketupu* (Buffy Fish-Owl) from the Cocos (Keeling) Islands (Gibson-Hill 1949) on the supplementary list pending confirmation of the specimen. Schodde (1997d), followed by Higgins (1999), accepted the record on the assumption that the 'skin is probably deposited in the Raffles Museum', but until confirmation of the specimen or its identity appears, this may be premature. As explained in the introduction, this species is here transferred to the main list for consistency with the treatment of similar Cocos (Keeling) Islands records. Amadon and Bull (1988) and Wink and Heidrich (1999) concluded that *Ketupa* is embedded within, and not generically separate from, *Bubo*; it thus becomes *Bubo ketupu*.

Ninox strenua	Powerful Owl
Ninox rufa	Rufous Owl
Ninox connivens	Barking Owl
Ninox novaeseelandiae	Southern Boobook
Ninox scutulata	Brown Hawk-Owl$^{V,A/V}$
Ninox natalis	Christmas Island Hawk-Owl^{C}
Bubo ketupu	Buffy Fish-Owl^{CK}

Family Tytonidae

Other than *Tyto*, the only other genus in the Tytonidae is *Phodilus* (bay owls), which is clearly part of this family on the basis of cytochrome-*b* sequences (Wink and Heidrich 1999) and karyotypes (reviewed in Christidis 1990a).

Tyto can be divided into four groups: sooty owls, masked owls, barn owls and grass owls (Bruce 1999). All four groups are represented in Australia. Schodde and Mason (1981) and Schodde (1997e) grouped the first two in the subgenus *Megastrix* and the latter two in the subgenus *Tyto*. Species sequences adopted by Sibley and Monroe (1990), Christidis and Boles (1994) and Bruce (1999) are consistent with this arrangement, *contra* that in König *et al.* (1999).

Schodde and Mason (1981) separated *T. tenebricosa* into two species: *T. tenebricosa* (Sooty Owl; south-eastern Australia, New Guinea) and *T. multipunctata* (Lesser Sooty Owl; Wet Tropics of north-eastern Australia). Subsequent authors have followed this treatment (Sibley and Monroe 1990; Christidis and Boles 1994; Schodde 1997e; Bruce 1999; König *et al.* 1999; Higgins 1999; Dickinson 2003). Christidis and Boles (1994) commented that according to the isolation scenario postulated by Schodde and Mason (1981), *T. t. tenebricosa* from Australia and *T. t. arfaki* from New Guinea should have the same relative taxonomic status as *T. multipunctata*, as all three isolates would have become separated at the same time. Norman *et al.* (2002) examined this issue using mitochondrial and nuclear DNA sequence data. Their results showed that the three isolates were equally diverged genetically, at a level comparable to intraspecific variation in other owls. These authors concluded that only one species, *T. tenebricosa* – with three recently diverged subspecies (*tenebricosa*, *multipunctata* and *arfaki*) – should be recognised. This treatment is followed here.

Species limits within the *T. novaehollandiae* (Masked Owl) complex are poorly understood. Mason (1983) reviewed the group and retained the forms in Australia (*novaehollandiae*, *castanops*, *galei*, *kimberli*, *melvillensis*), New Guinea (*calabyi*), Admiralty Islands (*manusi*) and Lesser Sundas (*sororcula*, *cayelii*) in one species. White and Bruce (1986) regarded *sororcula* (including *cayelii*) and *manusi* as separate species. McAllan and Bruce (1989) also elevated Tasmanian *castanops* to specific level. Sibley and Monroe (1990) and König *et al.* (1999) followed these treatments. Bruce (1999) and Dickinson (2003) accepted species status for *sororcula* and *manusi*, but treated *castanops* as a subspecies of *novaehollandiae*. In their regional treatments, both Andrew (1992) and Inskipp *et al.* (1996) maintained *sororcula* at specific level. There is clearly a need for DNA-based research on this complex. For the present, the conclusions of Mason (1983) are followed, as little evidence has been presented to justify species separation of the various northern forms.

Tyto alba (Barn Owl) has a worldwide distribution with 28–32 subspecies currently recognised (Bruce 1999; König *et al.* 1999; Dickinson 2003). *Tyto glaucops* (Ashy-faced Owl) from Hispaniola, West Indies, was treated as a separate species from *T. alba* because the island was colonised by *T. alba pratincola* in the 1970s with no subsequent reports of interbreeding (AOU 1983, 1998). König *et al.* (1999) also suggested that the vocalisations of *glaucops* and *pratincola* differ sufficiently to warrant species separation (based on published recordings by Hardy *et al.* 1989).

Wink and Heidrich (1999) reported 1.8% DNA sequence divergence (based on the mitochondrial cytochrome-*b* gene) between *Tyto glaucops* and *T. alba pratincola*. Both forms were 8% diverged from *T. alba alba* (Europe) and *T. alba affinis* (South Africa), with up to 2% sequence divergence between *T. alba alba* and *T. alba affinis*. Wink and Heidrich (1999) concluded that *pratincola* should either be treated as a species separate from nominate *alba* or else as a subspecies of *T. glaucops*.

It appears likely that the Neotropical and Nearctic forms are distinct species from *T. alba alba*. If these comprise a single species, the oldest available name is *T. furcata* Temminck, 1827, based on birds from Cuba. A possible English name for this species could be New World Barn Owl, while Common Barn Owl would be the most appropriate name for *T. alba* as defined here. Although the taxonomic treatment recommended here may appear premature given the limited data available, the current convention of separating out only *T. glaucops* as a separate species makes *T. alba* paraphyletic.

There is also the issue whether the Old World and Australasian forms of *T. alba* constitute a single species. Christidis (1990a) noted that the chromosomal karyotypes of two European individuals of *T. alba* differed markedly from that of an Indian bird. Furthermore, according to J. Pettigrew (cited by Schodde 1997e), there are differences in visual acuity between the Australasian *T. a. delicatula* and other forms of the *T. alba* complex examined. The molecular phylogeny of Wink *et al.* (2004c) showed three main clades within the conventional *Tyto alba*, corresponding to the European-African, North American and Australasian–South-east Asian populations (the last was represented by *deliculata* of Australia and south-west Pacific, *javanica* of Malay Peninsula through Wallacea and *sumbaensis* of Sumba Island). The Australo-Asian clade has a sister relationship to the remaining forms, in which is embedded *T. soumegnai* (Madagascan Red Owl), which is usually maintained as a distinct species. The authors remarked that some of these, including *deliculata*, 'could easily be raised to species rank according to the genetic divergences found'.

Wink *et al.* (2004c) used a limited taxonomic sampling, and did not present genetic distances, so it is difficult to assess which of the represented forms warrant species level recognition. The conservative treatment of the available data is to regard each of the three main clades as species. Thus, birds from southern Asia though Australia and the Pacific take the name *javanica* Gmelin, 1788, which has priority over *deliculata* Gould, 1837. The English name Pacific Barn Owl is not appropriate across this species' entire range. Indo-Pacific Barn Owl is more correct, but unwieldy. For the moment, Eastern Barn Owl can be used, although alternatives should be considered.

Both subspecies *delicatula* and *pratincola* (North America) were once introduced to Lord Howe Island (Hindwood 1940). It has been suggested that the two forms did not interbreed (AOU 1983: 291), but both became extinct on the island before conclusive data could be gathered (Bruce 1999). According to the taxonomic treatment adopted here, two species of barn owl were consequently introduced to Lord Howe Island: *T. javanica* and *T. furcata*. As the latter represents a failed introduction, it is not included on the Australian Species List.

Many recent works (e.g. Sibley and Monroe 1990; Andrew 1992; Bruce 1999; König *et al.* 1999) accepted two species in the *T. capensis* group: *T. capensis* (African Grass Owl; southern Africa) and *T. longimembris* (Eastern Grass Owl; southern Asia, New Guinea, Australia, south-west Pacific islands). Other authors, such as Mees (1964), Schodde and Mason (1981), White and Bruce (1986), Inskipp *et al.* (1996), Schodde (1997e) and Johnstone (2001), recognised a single species, *T. capensis* (although Bruce [in White and Bruce 1986] noted that the two might best be treated as separate species). Christidis and Boles (1994) maintained one species, although noting that the issue required further work. Rasmussen and Anderton (2004) indicated that there were numerous differences between *capensis* and *longimembris* (including plumage characters, proportions, egg size and at least some vocalisations) that clearly indicated that these were distinct species. This is accepted here and Australian birds are treated as *Tyto longimembris*, with English name Eastern Grass Owl.

Tyto tenebricosa	Sooty Owl
Tyto novaehollandiae	Masked Owl
Tyto javanica	Eastern Barn Owl
Tyto longimembris	Eastern Grass Owl

ORDER CORACIIFORMES

The kingfishers have been traditionally placed in a single family, which has three well-defined subfamilies: Alcedininae (river kingfishers); Halcyoninae (tree kingfishers) (= Daceloninae of earlier authors, such as Sibley and Monroe [1990], cf. Sibley and Monroe [1993]); and Cerylinae (water kingfishers). These divisions are supported by a range of data, including DNA–DNA hybridisation (Sibley and Ahlquist 1990), chromosomes (reviewed in Christidis 1990), myology (e.g. Maurer and Raikow 1981), moult patterns (Miller 1912) and mitochondrial and nuclear DNA sequences (Moyle 2006). Moyle (2006) found that the Alcedininae were the sister clade to another comprising the other groups. Sibley and Ahlquist (1990) and Sibley and Monroe (1990) elevated the subfamilies to family level, which was followed by some authors (e.g. Fry *et al.* 1992; Christidis and Boles 1994), but not others (e.g. Schodde 1997h; Woodall 2001; Dickinson 2003). There seems little doubt that each group is a monophyletic group, which together form a monophyletic kingfisher clade. The level of differentiation seems to warrant recognition of three families of kingfishers, as is accepted here. Two of these occur in Australia.

Family Alcedinidae

In the classification of Sibley and Monroe (1990), this family comprised three genera: *Ceyx*, *Alcedo* and *Ispidina*. Most recent authors (e.g. Fry *et al*. 1992; Woodall 2001; Dickinson 2003) have merged the two African species of *Ispidina* in *Alcedo*. A major question is to which genus the two Australian species should be allocated. Alternative treatments have included the Australian species in:

(1) *Ceyx*, on the basis of having three toes (Condon 1975)
(2) *Alcedo*, on the interpretation of this feature to be convergent on true members of *Ceyx* (Fry 1980)
(3) *Alcyone* (merged in *Alcedo* by most authors) because the species are closer to *Alcedo,* but still warrant recognition at generic level (Forshaw 1987).

The inclusion of both species in *Alcedo* has received general acceptance (e.g. Beehler *et al*. 1986; Schodde and Tidemann 1986; Sibley and Monroe 1990; Christidis and Boles 1994; Fry *et al*. 1992; Schodde 1997h; Woodall 2001; Dickinson 2003).

Moyle *et al.* (2007) conducted a more detailed examination of the alcedinine kingfishers using the mitochondrial ND2 gene and the second intron of the nuclear myoglobin gene. The species commonly placed in *Alcedo* did not form a monophyletic group relative to the other members of this family. Contrary to recent practice, the Australian breeding species grouped with the other three-toed kingfishers, and Moyle *et al.* (2007) recommended that they be included in the genus *Ceyx*. This is accepted for this list. *Ceyx pusilla* (Little Kingfisher), *C. azurea* (Azure Kingfisher) and *C. websteri* (Bismarck Kingfisher; Bismarck Archipelago) formed a monophyletic group, with the last two being sister taxa.

Alcedo atthis (Common Kingfisher) has been recorded as a vagrant from Christmas Island (BARC 364; Palliser 2004). A subsequent report from 2006 has not been assessed by BARC. This is the type species of the genus *Alcedo.*

Alcedo atthis	Common Kingfisher$^{C/V}$
Ceyx azureus	Azure Kingfisher
Ceyx pusillus	Little Kingfisher

Family Halcyonidae

The family name for the tree kingfishers is the Halcyonidae Vigors, 1825, which has priority over Dacelonidae Bonaparte, 1841. Christidis and Boles (1994) and Schodde (1997h) accepted four genera for the Australian breeding species: *Dacelo* (kookaburras), *Tanysiptera* (paradise-kingfishers), *Syma* (yellow-billed kingfishers) and *Todiramphus* (*T. sanctus*, Sacred Kingfisher, and related forms).

Conventional practice has been to conceive *Halcyon* as including Australasian species, as well as those of Africa and Asia. The generic distinctiveness of the Australasian taxa is supported by an extensive range of different types of evidence, including pterylosis (Beddard 1896, Mitchell 1901), myology (Mitchell 1901; Maurer and Raikow 1981), osteology (e.g. Burton 1978), feather proteins (Knox 1980), DNA–DNA hybridisation (Sibley and Ahlquist 1990) and DNA sequences (Moyle 2006). When segregated generically, the name *Todiramphus* Lesson, 1827, applies to the Australasian species. This action has been followed by Christidis and Boles (1994), Schodde (1997h), Woodall (2001) and Dickinson (2003). The original spelling is *Todiramphus*, not *Todirhamphus* (Fry 1980; McAllan and Bruce 1988; *contra* Sibley and Monroe 1990).

Sibley and Monroe (1990) and Christidis and Boles (1994) argued that Gould (1838, 1840, 1842) had treated *Halcyon* as masculine when naming *H. incintus* and *H. sordidus*. Therefore, when he created the name *Halcyon pyrrhopygia* (Red-backed Kingfisher), Gould must have considered the specific epithet to be a noun in apposition because the ending did not change to match the gender of *Todiramphus*. David and Gosselin (2002b) pointed out that Gould also named *H. saurophaga*, implying that his gender treatment of the generic name could not be established. *Halcyon* is now confirmed as being feminine (ICZN 1999, Art. 30.1.1; David and Gosselin 2002b), and the specific epithet of the Red-backed Kingfisher must be considered an adjective and its ending changed accordingly (i.e. *Todiramphus pyrrhopygius*).

Though Fry (1980) and Fry *et al.* (1992) combined *Syma* within *Halcyon* (*sensu lato*, including *Todiramphus*), following Peters (1945), no thorough morphological examinations have been published on the group. Common recent practice is followed in maintaining *Syma* for the yellow-billed kingfishers (Forshaw 1987; Sibley and Monroe 1990; Schodde 1997h; Woodall 2001; Dickinson 2003). This was corroborated by Moyle (2006).

Moyle (2006) recovered *Syma* as a sister genus to *Todiramphus* and these, in turn, to *Actenoides* (wood kingfishers; Indonesia, Philippines, Solomons). This group joined another subclade comprising the larger-bodied forms *Dacelo* and the monotypic New Guinea taxa *Clytoceyx rex* (Shovel-billed Kingfisher) and *Melidora macrorrhina* (Hook-billed Kingfisher) and the pair *Tanysiptera* and *Cittura* (*C. cyanotis*, Lilac Kingfisher; Sulawesi). *Halcyon* is a sister genus to *Pelargopsis* (stork-billed kingfishers; south-east Asia) in a clade that also includes *Lacedo* (*L. pulchella*, Banded Kingfisher; south-east Asia). The sequence of genera follows that implied by the phylogeny in Moyle (2006), and that of species follows Woodall (2001).

Apparent records of *Tanysiptera galatea* (Common Paradise-Kingfisher) from the Torres Strait islands have not been accepted owing to the inability to conclusively exclude closely related species (Draffan 1978; RAOU 1988; Garnett and Smith 1997), although these reports are regarded as highly probable. A record of *Halcyon pileata* (Black-capped Kingfisher) is based on a specimen from southern Western Australia and so is included on the main list (Dooley 2005b). *Dacelo gaudichaud* (Rufous-bellied Kookaburra) is placed on the supplementary list on the basis of a report from Saibai Island, Torres Strait (Eades 1998); it has not been assessed by a rarities committee.

Tanysiptera sylvia	Buff-breasted Paradise-Kingfisher
Tanysiptera galatea	Common Paradise-Kingfisher$^{S(TS)}$
Dacelo novaeguineae	Laughing Kookaburra
Dacelo leachii	Blue-winged Kookaburra
Dacelo gaudichaud	Rufous-bellied Kookaburra$^{S(TS)}$
Syma torotoro	Yellow-billed Kingfisher
Todiramphus macleayii	Forest Kingfisher
Todiramphus pyrrhopygius	Red-backed Kingfisher
Todiramphus sanctus	Sacred Kingfisher
Todiramphus chloris	Collared Kingfisher
Halcyon pileata	Black-capped Kingfisher^{V}

Family Meropidae

This family is represented in Australia by a single species, *Merops ornatus* (Rainbow Bee-eater). Burt (2004) used plumage characters to obtain a phylogeny of this genus. *Merops ornatus* is a sister species to *M. hirundineus* (Swallow-tailed Bee-eater; Africa) within a larger cluster that includes *M. leschenaulti* (Chestnut-headed Bee-eater; south and south-east Asia), *M. viridis* (Blue-throated Bee-eater; south-east Asia, Philippines) and, in some analyses, *M. apiaster* (European Bee-eater; Europe, Africa) and *M. boehmi* (Boehm's Bee-eater; Africa). There are no changes from Christidis and Boles (1994).

Merops ornatus	Rainbow Bee-eater

Family Coraciidae

The rollers are represented in Australia by *Eurystomus orientalis* (Dollarbird). The Moluccan population *azureus*, previously included in this species, was regarded as sufficiently distinct by Fry *et al.* (1992 and references therein) to be itself treated at specific level as *Eurystomus azureus* (Azure Roller). This does not affect the name of Australian birds. There are no changes from Christidis and Boles (1994).

Eurystomus orientalis	Dollarbird

ORDER PASSERIFORMES

Higher-level categories

Striking modifications to traditional passerine systematics began with the egg-white-protein electrophoresis of Sibley (1970, 1976), and were further developed with DNA–DNA hybridisation work (Sibley and Ahlquist 1985, 1990; Sibley *et al.* 1988). Those studies showed that the earliest divergence among living Passeriformes was between the Acanthisittidae (New Zealand wrens) and all other passerine taxa (Eupasseres; Ericson *et al.* 2002a; Barker *et al.* 2002). The next division was between the traditional suboscines (Tyranni) and oscines (Passeri). It was within the latter group that the major reorganisations occurred. Traditional classifications (e.g. Mayr and Amadon 1951; Wetmore 1960) placed numerous morphologically and ecologically similar forms together (for example, Australian treecreepers *Climacteris* and *Cormobates* with the Holarctic creepers *Certhia*, African Spotted Creeper *Salpornis* and Philippine creepers *Rhabdornis*). Sibley and his colleagues showed that similarities between Australasian components of these clusters and those from elsewhere were usually convergent. In fact, the Australasian taxa formed a large radiation, with many endemic or near endemic elements, which 'parallelled' those found elsewhere in the world. Sibley discerned these as two major clades of oscine passerines – one comprising most of the 'typical' Australo-Papuan songbird groups (Corvida) and the other based primarily in the Holarctic, South America and Africa (Passerida).

Sibley and his colleagues interpreted the Corvida as having three major components: the Menuroidea (lyrebirds, scrub-birds, treecreepers, bowerbirds), Meliphagoidea (such as fairy-wrens, acanthizid warblers, pardalotes, honeyeaters) and Corvoidea (such as crows, woodswallows, butcherbirds, orioles, cuckoo-shrikes, birds-of-paradise, monarch flycatchers). There were likewise three divisions in the Passerida: Sylvioidea (Old World warblers, swallows, silvereyes and bulbuls); Passeroidea (finches, larks, pipits and wagtails, flowerpeckers and sunbirds); and Muscicapoidea (thrushes, Old World flycatchers and starlings). Apart from the position of the bowerbirds, this classification was reflected in the list of Christidis and Boles (1994).

The relationships within the oscines – and particularly between the Corvida and Passerida – have since been studied and clarified in greater detail by Barker *et al.* (2002, 2004) and Ericson *et al.* (2002a, b; 2003b). Those authors found that the Menuridae (lyrebirds) are an early lineage, which are independent of the treecreepers and bowerbirds. Presumably, the Atrichornithidae (scrub-birds) sit apart with the Menuridae, although it was not included in those studies; these two families have been conventionally associated based on a range of anatomical characters (reviewed in Bock and Clench 1985). Ericson *et al.* (2002b) gave the name Menurae to Menuridae and Atrichornithidae and Euoscines to all other oscines. A contrasting arrangement was obtained by Livezey and Zusi (2007): based on a quite small number of passeriform taxa, their classification placed the Menuridae as a sister taxon to the suboscine–oscine clade.

There is a major alteration from the treatment in Christidis and Boles (1994). The association by Sibley and Ahlquist (1990) and Sibley and Monroe (1990) of the Ptilonorhynchidae (bowerbirds) with the lyrebirds and treecreepers was regarded by several authors as artefactual and was treated as such by Christidis and Boles (1994) and Schodde and Mason (1999), who retained it in a more traditional association with the birds-of-paradise, ravens and allies. It is now clear that Sibley and Ahlquist's (1990) finding was correct (Ericson *et al.* 2002a; Barker *et al.* 2002, 2004; Cracraft *et al.* 2004). The bowerbirds are shifted in this sequence to reflect that. While the conventional relationship between bowerbirds and birds-of-paradise has been shown not to exist, the apparent association with the treecreepers may be a product of their antiquity: these ancient families could be independent surviving lineages that are placed together through idiosyncrasies of the algorithms used in the phylogenetic software performing the analyses (e.g. long-branch attraction).

Barker *et al.* (2002) and Ericson *et al.* (2002a) showed that, contrary to Sibley and Ahlquist (1990), Passerida is not the sister clade of the Corvida; rather, it is embedded within it, where it is the sister group to a subset of the Corvoidea of Sibley and Ahlquist (1990), hereafter cited as the 'core corvines'. Several families placed in the Corvoidea *sensu* Sibley and Ahlquist (1990) are successive sister lineages to this assemblage, and thus fall outside the core corvine group – these are referred to as 'non-core corvines'. Even if the Passerida are excluded, the Corvida and Corvoidea as delimited by Sibley and Ahlquist (1990) and Sibley and Monroe (1990) are paraphyletic. New names will need to be introduced for some of these clades as now recognised. In a provisional classification, Ericson *et al.* (2003b) recommended listing treecreepers, bowerbirds, Meliphagoidea, Corvoidea, larks and the Sylvioidea as *incertae sedis*.

Within Australia, the Orthonychidae (logrunners) and Pomatostomidae (Australo-Papuan babblers) are the basally branching lineages of the non-core corvines. The sister lineage to the core corvines comprises the Cnemophilidae (cnemophiline birds-of-paradise), Melanocharitidae (New Guinea berrypeckers) and Callaeatidae (New Zealand wattlebirds). The Petroicidae (Australo-Papuan robins), which were also placed by Sibley and Ahlquist (1990) in a non-core position within the Corvoidea, were found by Barker *et al.* (2004), Cracraft *et al.* (2004) and Beresford *et al.* (2005) to be at the base of the Passerida, as are the enigmatic African genera *Picathartes* (bald crows) and *Chaethops* (rock-jumpers). (Note, however, that Treplin and Tiedemann [2007], using retrotransposon insertions, placed *Picathartes* deeper in the Corvida.)

The core corvines are represented in Australia by the Corvidae (ravens and crows), Laniidae (true shrikes), Monarchidae (monarch flycatchers), Corcoracidae (mudnest builders), Paradisaeidae (birds-of-paradise), Rhipiduridae (fantails), Dicruridae (drongos), Artamidae (woodswallows, butcherbirds and magpies), Pachycephalidae (whistlers and allies), Campephagidae (cuckoo-shrikes), Oriolidae (Old World orioles) and Neosittidae (sittellas) (Barker *et al.* 2002, 2004). Cracraft *et al.* (2004) subdivided this assemblage, segregating the Australian mudnest builders (*Corcorax*, *Struthidea*), birds-of-paradise, monarch flycatchers, ravens and crows, true shrikes, fantails and drongos as a more strictly delimited Corvoidea, and placing the butcherbirds, magpies, currawongs and woodswallows in a group – the Malaconotoidea – that also comprises various African groups (such as the bush and vanga shrikes, ioras and batises). The composition of this group was extended to include several Asian genera (Moyle *et al.* 2006). The remaining core corvines could not be more closely linked with any other lineage. Within the Passerida, Cracraft *et al.* (2004) erected the Certhioidea for the non-Australian Troglodytidae (wrens), Certhiidae (Holarctic treecreepers) and Sittidae (nuthatches) – groups included by Sibley and Ahlquist (1990) in their Sylvioidea.

The relative positions of the major clades within this list can reflect the revised understanding of the inter-relationships with minimal changes from Christidis and Boles (1994). Taxonomic categories between order and family are not used, given the current uncertainty regarding these. The general sequence of passerine families follows that of Christidis and Boles (1994); however, there are several major amendments to the sequence within, and composition of, some passerine families.

Family delimitations and sequence

Christidis and Boles (1994) took a conservative approach in their treatment of most family circumscriptions for the Australasian songbirds. They followed Sibley and Monroe (1990) in merging the Pardalotidae (pardalotes) and Acanthizidae (acanthizid warblers, e.g. gerygones, scrubwrens, thornbills) at the family level. Schodde and Mason (1999) kept these as separate families, citing several morphological, behavioural and mitochondrial DNA sequence data to support this action. These data were not analysed in any phylogenetic or comparative framework. The citation in Schodde and Mason (1999) regarding the DNA sequence data was based on a poster presented at a meeting, for which only the abstract was published in the proceedings (Cracraft *et al.* 1998); it did not provide details such as the type of analyses performed or the results obtained. It is not considered further here.

The combined mitochondrial DNA and morphological analyses of Cracraft and Feinstein (1998) found that fairy-wrens, pardalotes, acanthizid warblers and honeyeaters formed a monophyletic group. Within this, *Malurus* was the first diverged lineage and the acanthizids (*Sericornis* and *Acanthiza*) formed an unresolved trichotomy with honeyeaters, as previously suggested by DNA–DNA hybridisation (Sibley and Ahlquist 1990) and protein allozyme (Christidis and Schodde 1997) data.

More recent data of both mtDNA and nuclear DNA sequences (Driskell and Christidis 2004), using the Maluridae as the outgroup, indicated that *Dasyornis* (bristlebirds) occupies a basal position within the Acanthizidae–Pardalotidae–Meliphagidae assemblage. Moreover, pardalotes are more closely linked to honeyeaters than to acanthizids. Further work is needed, but those studies showed clearly that bristlebirds, acanthizid warblers, pardalotes and honeyeaters form a monophyletic clade – with the Maluridae as the sister taxon to this assemblage.

Given these molecular findings, and the morphological arguments put forth by Schodde and Mason (1999), it seems sensible to separate the Pardalotidae and Acanthizidae as families. In addition, *Dasyornis* is also separated at family level, as was done by Johnstone and Storr (2004), because not to do so would create a paraphyletic family Acanthizidae. Schodde and Mason (1999) argued that *Pycnoptilus* (Pilotbird) is more closely related to *Dasyornis* than to any other acanthizids, but *Pycnoptilus* is here retained in the Acanthizidae pending published molecular data. The sequence adopted here – Dasyornithidae, Acanthizidae, Pardalotidae, Meliphagidae – reflects the branching patterns in Driskell and Christidis (2004).

The position of the Petroicidae has been altered in the linear sequence, from near the Meliphagidae to a position at the start of the Passerida, to reflect the findings of Barker *et al.* (2004) and Cracraft *et al.* (2004).

The Orthonychidae of Deignan (1964) were a heterogeneous assemblage of mainly terrestrial species, placed together more from superficial resemblance and convenience than any real evidence of close relationships. The logrunners (*Orthonyx*) were shown by Sibley and Ahlquist (1985) to be quite distinct from all other birds, warranting placement in their own family. These took the name Orthonychidae, with Eupetidae being the senior name for the remaining species. (although Cinclosomatidae Mathews, 1921–2 has been used by a number of authors in recent years, Eupetidae Bonaparte, 1850 has priority.) Subsequently, it has been shown that these constituent taxa do not form a natural group. Jonsson et al. (2007) demonstrated that the affinities of the nominate genus, *Eupetes* (*E. macrocercus*, Malayasian Rail-babbler) – a south-east Asian genus – are not with any of the other taxa currently placed in this family. With the removal of *Eupetes*, the applicable name for the remaining species, including the two Australian genera, *Cinclosoma* (quail-thrushes) and *Psophodes* (whipbirds and wedgebills), is Psophodidae Bonaparte, 1854. If these two genera are, in turn, found to belong to separate families, the names Cinclosomatidae and Psophodidae apply, respectively. Both genera fall within the 'core corvines'. Although their allocation to separate families is not adopted in this list, the possibility that future studies will find that this is warranted is flagged here.

Christidis and Boles (1994) adopted the composition of the Dicruridae used by Sibley and Monroe (1990), which comprised the dicrurine (drongos), grallinine (magpie-larks), monarchine (monarch flycatchers) and rhipidurine (fantails) assemblages, but treated them as a single family. Support for this alliance came from protein allozyme studies (Christidis and Schodde 1991a), DNA–DNA hybridisation (Sibley and Ahlquist 1985, 1990), skull morphology (Olson 1989) and microcomplement fixation (Baverstock *et al.* 1992). Dicruridae Vigors, 1825 has nomenclatural priority for this group. Schodde and Mason (1999) adopted the same family circumscription, although theirs differed in generic and specific sequences. Dickinson (2003) retained the drongos, monarchs (including *Grallina*) and fantails as separate families (Dicruridae, Monarchidae and Rhipiduridae, respectively). The phylogenies in Barker *et al.* (2004) and Cracraft *et al.* (2004) showed that these families were all part of the same subgroup of core corvines, but did not themselves form a monophyletic assemblage. *Grallina* is associated with the monarchs, and these, in turn, are part of a group that includes the crows, birds-of-paradise, shrikes, mudnest builders and New Guinean melampittas, although the branching topography of these birds is not fully resolved. The fantails are close to *Chaetorhychus papuensis* (Pygmy Drongo) of New Guinea, and together are the sister group of the former array. The true drongos *Dicrurus* are then a sister genus to this clade. Cracraft *et al.* (2004) restricted the name Corvoidea to this group. The recognition of three families, as done by Dickinson (2003), is adopted here.

Schodde and Mason (1999) recognised a new subfamily for the genus *Machaerirhynchus* (boatbills), citing characters of the skull and albumin immunological distances from Baverstock *et al.* (1992). Dickinson (2003) raised this group to family level and removed it from near the Monarchidae in the linear sequence. Without placing the skull characters in a phylogenetic context, it is difficult to assess their significance. The immunological distances between *Machaerirhynchus* and the other taxa examined by Baverstock *et al.* (1992) were indeed large, although as those authors pointed out, large immunological distances are sometimes recorded between closely related species owing to large rate variation in the evolution of the albumin molecule (e.g. Baverstock *et al.* 1991). The level of distinctiveness of this genus needs further testing. There is not yet sufficient published evidence to justify placing *Machaerirhynchus* in its own family or to determine its affinities, if not with the monarchines.

The woodswallows and currawong–butcherbird group were combined at family level by Christidis and Boles (1994) and Schodde and Mason (1999), and the close relationship between these was confirmed by Barker *et al.* (2004) and Cracraft *et al.* (2004). The Artamidae and Cracticidae were kept separate by Johnstone and Storr (2004): they fall in a clade that includes a number of African groups – the ioras, batises, helmet shrikes, bush shrikes and vanga shrikes. The name Malaconotoidea was given to this group by Cracraft *et al.* (2004).

The inter-relationships of other Australian corvine groups (orioles, cuckoo-shrikes, whipbirds, sittellas, pachycephalids) have not been resolved. There may be a link between whipbirds and sittellas. Interestingly, there is also the possibility that the whistlers, shrike-thrushes, Crested Bellbird, New Guinea pitohuis and shrike-tits, which are conventionally placed in the Pachycephalidae, are polyphyletic (*cf.* Barker *et al.* 2004; Jønsson and Fjelds 2006).

Scott (1997) undertook a mitochondrial DNA (cytochrome-*b*) study on the affinities of *Daphoenositta* within the Pachycephalinae complex as identified by the DNA–DNA hybridisation studies of Sibley and Ahlquist (1990) and detailed in Sibley and Monroe (1990). He found no support for a monophyletic Pachycephalinae as circumscribed by those authors. The component genera were interspersed between representatives of the Corvinae, Dicrurinae, Paradisaeinae and Laniidae, among others. Relationships among the various genera of the Pachycephalinae (*sensu* Sibley and Monroe 1990) were difficult to establish, as most of the nodes in the phylogeny were poorly supported. Some of the more pertinent findings of his study were:

(1) *Daphoenositta* is more closely linked to the Laniidae than it is to the Pachycephalinae.
(2) *Falcunculus* and *Oreoica* are not closely allied, contrary to their inclusion in the same tribe Falcunculini by Sibley and Monroe (1990).
(3) *Pachycephala* and *Pitohui* are sister taxa to the exclusion of *Colluricincla*.

Dickinson (2003) separated from the conventional Pachycephalidae (*sensu* Mayr 1967) *Falcunculus* (shrike-tit) and *Eulacestoma nigropectus* (Ploughbill; New Guinea) as the family Falcunculidae, and *Colluricincla* (shrike-thrushes), *Pitohui* (pitohuis; New Guinea) and *Oreoica gutturalis* (Crested Bellbird) as the Colluricinclidae. No explanation or reference was offered for those actions, and the Colluricinclidae were separated from Pachycephalidae in the linear sequence by three families. The conventional family Pachycephalidae is retained here until more work addresses the questions of its composition and the correct placement of its putative members, with the acknowledgment that it may well be an unnatural assemblage.

Within the Corvoidea, the 'core corvines' were combined by Sibley and Monroe (1990) into a single family, Corvidae. This action has been followed by few authors. Christidis and Boles (1994) and Schodde and Mason (1999), among others, maintained the traditional family divisions. The phylogenetic trees of Barker *et al*. (2002, 2004) and Cracraft *et al*. (2004) indicate that this issue needs more investigation before such action can be taken: which groups might be included in an expanded Corvidae, and whether similar mergers are desirable for the remaining forms, merit further examination. The conventional families within the corvine groups are retained here, with the sequence altered to reflect the phylogeny in Barker *et al*. (2004), supplemented by that in Cracraft *et al*. (2004). Placement of the Pachycephalidae is based on the position of *Pachycephala* (whistlers).

The Petroicidae are placed in the sequence at the head of the Passerida. Barker *et al*. (2002, 2004) and Cracraft *et al*. (2004) indicate that among the core Passerida, the Sylvioidea is a sister group to the remaining taxa. The sequence is altered from Christidis and Boles (1994) to reflect this by placing the Sylvioidea first. Because the Australian members of the Passeroidea and Muscicapoidea are sister groups, either can be listed first without misrepresenting the phylogeny. Their relative placements correspond to those in recent world texts such as del Hoyo *et al*. (1992–ongoing) and Dickinson (2003)

Two large, traditional, mostly Palaearctic families have been suspected of also being 'catch all' collections based around cores of natural groups: the Sylviidae (Old World warblers) and Timaliidae (true babblers). Using the conventional circumscriptions of these families (e.g. Deignan 1964; Watson *et al*. 1986a), the Sylviidae are represented in Australia by five genera, but there are no members of the Timaliidae. Many authors have acknowledged that discerning the dividing line between these families is problematic. The classification of Sibley and Monroe (1990), based on Sibley and Ahlquist (1990), combined the families, while removing several taxa traditionally regarded as sylviid warblers (see below). They recognised four subfamilies: Acrocephalinae (reed warblers); Megalurinae (grass-warblers and grassbirds); Garrulacinae (laughing-thrushes, which are conventionally included in the babblers); and Sylviinae. The last was further subdivided into three tribes: Chamaeini (*Chamaea fasciata*, Wren-tit; North America); Timaliini (timaliid babblers); and Sylviini (*Sylvia*; sylvia warblers). Several other groups usually included among the Sylviidae (*sensu stricto*) were segregated at family level (see below).

The close association between *Sylvia* and the majority of timaliine and garrulacine babblers was demonstrated by Cibois *et al.*(1999) and Barker *et al.* (2002), supporting findings previously reported by Sibley and Ahlquist (1990) Placement of these in the same family is well supported. This raises nomenclatural issues, as the type genera for the Sylviidae (*Sylvia*) and Timaliidae (*Timalia*) are resultingly members of the same family. Sylviidae Leach, 1820, has priority over Timaliidae Vigors and Horsfield, 1827. Sibley and Monroe (1990) previously used Sylviidae for the family including both *Sylvia* and *Timalia*. According to Cibois (2003a, b), this application of priority should be followed if the babblers and various warbler groups were merged in one family; however, she argued that if only *Sylvia* (*sensu lato*) were transferred to the babblers, then Sylviidae should be conditionally suppressed with respect to Timaliidae. This would maintain stability in the use of the latter name for the babblers. This recommendation was supported by Alström *et al.* (2005) and is followed here until such time as it is more formally considered.

Another finding of Cibois (2003a) was that *Zosterops* (white-eyes) are closely related the Asian babbler genus *Yuhina* and fall within the sylviid/babbler group. Although almost always maintained at family level as the Zosteropidae, these birds are clearly members of the Timaliidae. *Zosterops* is here transferred to that family.

Sibley and Ahlquist (1990) regarded *Regulus* and *Cisticola* and its allies as warranting family level separation. The Northern Hemisphere *Regulus* (kinglets and crests) were shown to be only distantly related to sylviids in a more detailed DNA–DNA hybridisation study by Sheldon and Gill (1996) and mitochondrial DNA sequencing studies of Leisler *et al.* (1997), Sturmbauer *et al.* (1998) and Alström *et al.* (2005); here these are maintained as the family Regulidae. The recognition of the Cisticolidae by some authors (e.g. Sibley and Monroe 1990; Dickinson 2003) to accommodate *Cisticola* and related taxa (such as *Prinia* and *Orthotomus*) received support from Alström *et al.* (2005), among others.

Alström *et al.* (2005), using mitochondrial and nuclear genes, also showed that several other conventional sylviid groups should be removed from that family as reconstituted and advocated treating a number of lineages as families. Those relevant to Australian taxa are the Acrocephalidae (reed warblers), Megaluridae (grassbirds and allies) and Phylloscopidae (leaf warblers). These family level divisions are accepted here, although eventually it may be shown to be preferable to combine some of these. The levels of differentiation among the lineages, as shown by the data in Alström *et al.* (2005), are quite variable. That between the acrocephaline and megalurine lines is less than that seen within some other of the families recognised by those authors, so a case could be made to retain these as a single family with two subfamilies, in which case Megaluridae Blyth, 1875, has priority over Acrocephalidae Salvin, 1882. Within Australia, the Acrocephalidae are represented by *Acrocephalus* and Megaluridae by *Megalurus*, *Cincloramphus* (songlarks) (Beresford *et al.* 2005) and presumably *Eremiornis* (Spinifexbird), although this species has not been the subject of any molecular investigations. One member of the Phylloscopidae occurs in Australia as a vagrant (*Phylloscopus borealis*, Arctic Warbler). The sequence of families follows that indicated by the phylogeny in Alström *et al.* (2005).

The evolution of a seed-cracking, conical, bill has occurred in several major lineages collectively known as finches (here cited as families for convenience): Fringillidae (Chaffinch and relatives), Carduelidae (goldfinches and relatives), Passeridae (House Sparrow and relatives), Estrildidae (waxbills and manikins), Viduidae (parasitic widowbirds), Ploceidae (weaver finches), Emberizidae (buntings and sparrows) and Cardinalidae (New World cardinals and relatives). All but the Cardinalidae are represented on the Australian list, and, with the exception of the Estrildidae, all are introductions or vagrants from introduced populations elsewhere. It has also been shown that several groups without finch-like bills are interspersed among these finch assemblages: Dicaeidae (flowerpeckers), Nectariniidae (sunbirds), Motacillidae (pipits and wagtails), Prunellidae (accentors) and possibly Alaudidae (larks). The relationships between these groups have attracted considerable attention, but little agreement has been reached. Christidis and Boles (1994) merged as families the Fringillidae with the Carduelidae and the Passeridae with the Estrildidae.

Sibley and Ahlquist's (1990) concept of the Passeroidea is supported as a natural group by the presence of a single amino acid insertion in *c-myc*, which is a synapomorphy of this clade (Ericson *et al.* 2000). In the classification of Sibley and Monroe (1990), the Australian taxa were placed into four families: Alaudidae; Nectariniidae (including Nectariniidae and Dicaeidae), Passeridae (Passeridae, Motacillidae, Prunellidae, Ploceidae, Estrildidae); and Fringillidae (Fringillidae, Carduelidae, Emberizidae).

Using DNA–DNA hybridisation, Sheldon and Gill (1996) did not find a link between Alaudidae and the Nectariniidae–Fringillidae group (however, of the latter group, they looked only at a New World blackbird, Icteridae, and spiderhunter, *Arachnothera*). The Alaudidae were linked with some of the sylvioids, but there was no evidence of monophyly of the latter group. Groth (1998), using complete mitochondrial cytochrome-*b* sequences, found that the Alaudidae sat outside of all Passeroidea and Sylvioidea (Muscicapoidea was not represented in the study). He recovered a clade containing the Fringillidae, Carduelidae, Motacillidae, Passeridae and Emberizidae, with the last three associated to the exclusion of the others. Two other clades were one of the Prunellidae, Ploceidae and Estrildidae and another of the Nectariniidae–Dicaeidae.

Barker *et al.* (2002) and Ericson and Johansson (2003) also found the Nectariniidae and Dicaeidae to be sister taxa. Several authors (e.g. Sibley and Monroe 1990, Cheke *et al.* 2001) had previously accepted these as a single family: Nectariniidae. Two New Guinean genera usually placed in the Dicaeidae – *Melanocharis* and *Paramythia* – have been placed in their own families, Melanocharitidae and Paramythiidae, respectively (Sibley and Monroe 1990), both of which belong in the Corvoidea *sensu* Sibley and Ahlquist (1990), as non-core and core corvines, respectively.

Yuri and Mindell (2002) recovered a sister relationship between the Fringillidae and Carduelidae, which form a monophyletic group with the Emberizidae *sensu lato*. Chu (2002), using osteological characters (mainly of the skull), found similar relationships between these groups.

Van der Meij *et al.* (2005) likewise obtained this topology, with the passerid sparrows being the sister group to this clade. Those authors also discovered an association between the ploceid weavers and estrildids, but recommended that these be treated as separate families.

Ericson *et al.* (2000) found a second insertion in *c-myc*, involving three amino acids, which linked the Motacillidae, Fringilldae, Emberizidae, Parulidae (New World wood warblers) and Icteridae. Members of the Passeroidea lacking this insertion were the Alaudidae, Dicaeidae, Nectariniidae, Prunellidae, Ploceidae, Estrildidae and Passeridae. Alström *et al.* (2005) excluded the Alaudidae from this assemblage, moving it to the Sylvioidea.

Despite some residual conflict regarding the position of several groups, several associations seem well-supported. The Alaudidae are segregated with the Sylvioidea, in a basal position, *contra* Sibley and Ahlquist (1990), following several recent studies. Within the Passeroidea, the Dicaeidae (1853) is merged with the Nectariniidae (1825), under the latter name. There is strong support for aligning the Motacillidae with the nine-primaried group; like other members of this assemblage, members of the Motacillidae have a vestigial 10th primary. As in Christidis and Boles (1994), the Chaffinch and cardueline finches are maintained as sister taxa within a single family (Fringillidae) and these, in turn, are a sister group to the Emberizidae, which is kept for the introduced *Emberiza citrinella* (Yellowhammer). In Christidis and Boles (1994), passerid sparrows, estrildid finches and ploceid weavers were placed in a single family: the Passeridae. Here they are each maintained at family level as the Passeridae, Estrildidae and Ploceidae, respectively. The position of Passeridae is ambiguous; evidence has been presented for relationships with either of the latter groups. To reflect this uncertainty, it is placed between them in the linear sequence.

The thrushes (Turdidae) have generally been considered to comprise two subgroups, the 'true' thrushes – generally large-bodied birds, such as species of *Turdus* and *Zoothera* – and the saxicoline chats – small-bodied forms, such as *Oenanthe* (wheatears), *Erithacus* (nightingales, European Robin) and *Saxicola* (chats). This group, in turn, has been aligned with the muscicapine or Old World flycatchers (Muscicapidae) such as *Muscicapa*, *Ficedula* and *Bradornis*, which are all small-bodied, primarily aerial feeders. Characters used to place the thrushes and muscicapines together include spotted juvenile plumages and a distinctive morphology of the syrinx ('turdine thumb') (Ames 1975). Traditionally these were maintained as two families (e.g. Peters' Check-list), but more recently they have been combined (as Muscicapidae), largely on the basis of the DNA–DNA hybridisation work by Sibley and Ahlquist (1990). Christidis and Boles (1994) placed the thrushes and muscicapine flycatchers together in the family Muscicapidae.

Sibley and Monroe (1990), although recognising a single family, considered the chats to be more closely related to the flycatchers than to the true thrushes. Such a relationship was confirmed by subsequent work based on mitochondrial and nuclear genes (Cibois and Cracraft 2004; Voelker and Spellman 2004). More surprising, however, was the finding that some genera conventionally regarded as typical flycatchers (e.g. *Ficedula*) were, in fact, chats. Also placed among the chats were the rock-thrushes *Monticola* (Voelker and Spellman 2004). The division of the thrush–flycatcher assemblage into two families, with the chats being transferred to the Muscicapidae (e.g. Dickinson 2003), is followed here, with the Australian compositions of each reflecting the findings of Voelker and Spellman (2004).

Family accounts

Family Pittidae

DNA sequence data clearly aligns the Pittidae with the other Old World suboscines: the Eurylaimidae (broadbills and asities). Together these form the sister group of the New World suboscines (such as the tyrant flycatchers, cotingas, woodcreepers, antbirds and ovenbirds) (Irestedt *et al.* 2001; Barker *et al.* 2002, 2004; Ericson *et al.* 2003b). No inclusions or taxonomic changes are made to Christidis and Boles (1994), who included three breeding and one vagrant species.

Pitta erythrogaster	Red-bellied Pitta
Pitta moluccensis	Blue-winged Pitta$^{V,C/V}$
Pitta versicolor	Noisy Pitta
Pitta iris	Rainbow Pitta

Family Menuridae

The scientific name of the Superb Lyrebird has been used as *Menura novaehollandiae* in recent works, based on publication in Latham's *Supplementum Indicis Ornithologici* in 1801. It was argued by Browning and Monroe (1991) that this date should be cited as 1802. This date was accepted by AOU (1998), Schodde and Mason (1999) and Dickinson (2003). It was noted by Dickinson (2003) that counter-arguments, yet to be published, supported retention of 1801 as the correct date. *Menura superba* is available for this species should Browning and Monroe (1991) prove correct and a more precise date than 1802 cannot be established (see discussion in Introduction to this work). An application has been made to the Zoological

Commission on Zoological Nomenclature to resolve this issue (Schodde *et al.* submitted). Until then, the name is retained as *Menura novaehollandiae*.

There are no other changes to Christidis and Boles (1994). The relationships of the lyrebirds were specifically addressed by Ericson *et al.* (2002a).

Menura alberti	Albert's Lyrebird
Menura novaehollandiae	Superb Lyrebird

Family Atrichornithidae

Christidis and Boles (1994) listed two species, and no change is made here.

Atrichornis rufescens	Rufous Scrub-bird
Atrichornis clamosus	Noisy Scrub-bird

Family Climacteridae

Two genera are recognised as in Christidis and Boles (1994). The New Guinean member of *Cormobates* (*C. placens*) is kept as a species separate from *C. leucophaea*, as is standard practice, although this has not been tested by molecular studies. *Cormobates* is feminine and *Climacteris* masculine (David and Gosselin 202b), and endings of specific epithets must change accordingly.

Cormobates leucophaea	White-throated Treecreeper
Climacteris affinis	White-browed Treecreeper
Climacteris erythrops	Red-browed Treecreeper
Climacteris picumnus	Brown Treecreeper
Climacteris melanurus	Black-tailed Treecreeper
Climacteris rufus	Rufous Treecreeper

Family Ptilonorhynchidae

Molecular (Kusmierski *et al.* 1993, 1997; Christidis and Schodde 1992) and non-molecular (Frith and Frith 2004) studies consistently identified three major lineages within the bowerbirds: (1) *Ailuroedus*; (2) *Chlamydera*, *Ptilonorhynchus*, *Sericulus*; and (3) *Amblyornis*, *Prionodura*, *Archboldia*, *Scenopoeetes*.

The cytochrome-*b* studies of Kusmierski *et al.* (1997) embedded *Prionodura* and *Archboldia* within *Amblyornis*. Storr (1984) previously included *Prionodura* within *Amblyornis*. Schodde and Mason (1999) suggested that the phylogenetic signal from the DNA data is misleading, but did not elaborate on this nor did they cite the more comprehensive study of Kusmierski *et al.* (1997). The DNA sequence data of Kusmierski *et al.* (1997) are, in fact, quite robust regarding these relationships – the authors concluded that bowers and plumage characters are limited as indicators of phylogenetic relationships within this group. This merger is accepted here.

Scenopoeetes is distinct enough genetically and morphologically to warrant generic separation. It was identified by Kusmierski *et al.* (1997) as the sister lineage to *Amblyornis sensu lato*.

Whether *Chlamydera*, *Ptilonorhynchus* and *Sericulus* should be maintained as separate or combined as one genus, *Ptilonorhynchus*, is not resolved (see discussion in Frith and Frith 2004). Schodde and Mason (1999) kept all three separate, arguing that *Ptilonorhynchus* should be maintained as a genus, using the species composition of *Chlamydera* and *Sericulus* as 'yardsticks' for generic circumscription. Storr (1984) combined the three, although he gave no reasons. If these mergers are accepted, the Ptilonorhynchidae would comprise four genera: *Ptilonorhynchus*, *Scenopoeetes*, *Amblyornis* and *Ailuroedus*, all of which are represented in Australia. An alternative arrangement suggested by the findings of Kusmierski *et al.* (1997) is that *Sericulus* be retained and *Ptilonorhynchus* and *Chlamydera* be merged. The Ptilonorhynchidae would then comprise five genera: *Ailuroedus*, *Scenopoeetes*, *Amblyornis*, *Sericulus* and *Ptilonorhynchus*, which all occur in Australia. The latter sequence follows that implied by the phylogeny in Kusmierski *et al.* (1997). Consequently, *Prionodura* is synonymised with *Amblyornis* and *Chlamydera* is merged with *Ptilonorhynchus*. Note that some changes to endings of specific epithets are required to conform to the gender of respective genera.

Ailuroedus crassirostris and *A. melanotis* are closely related and may be conspecific, but general practice is to maintain them as separate species (e.g. Sibley and Monroe 1990; Christidis and Boles 1994; Dickinson 2003; Frith and Frith 2004; but see Ford 1981b and Schodde and Mason 1999), and this is followed here.

Ailuroedus melanotis	Spotted Catbird
Ailuroedus crassirostris	Green Catbird
Scenopoeetes dentirostris	Tooth-billed Bowerbird
Amblyornis newtoniana	Golden Bowerbird
Sericulus chrysocephalus	Regent Bowerbird
Ptilonorhynchus violaceus	Satin Bowerbird
Ptilonorhynchus maculatus	Spotted Bowerbird
Ptilonorhynchus guttatus	Western Bowerbird
Ptilonorhynchus nuchalis	Great Bowerbird
Ptilonorhynchus cerviniventris	Fawn-breasted Bowerbird

Family Maluridae

A comprehensive protein allozyme study conducted by Christidis and Schodde (1997) identified two major assemblages within the Maluridae: (1) *Malurus*, *Stipiturus* and *Clytomias*; and (2) *Amytornis*. These are best treated as subfamilies: Malurinae and Amytornithinae, respectively. Most analyses of their data aligned *Clytomias* with *Malurus*. *Sipodotus* (New Guinea) was not examined, but was presumed to be part of the Malurinae.

Within *Malurus*, allozyme data (Christidis and Schodde 1997) recovered two principal lineages. The first comprises *M. cyaneus* (Superb Fairy-wren) *M. splendens* (Splendid Fairy-wren), *M. coronatus* (Purple-crowned Fairy-wren) *M. melanocephalus* (Red-backed Fairy-wren) *M. leucopterus* (White-winged Fairy-wren) and *M. alboscapulatus* (White-shouldered Fairy-wren; New Guinea). The other consists of *M. lamberti* (Variegated Fairy-wren), *M. amabilis* (Lovely Fairy-wren), *M. pulcherrimus* (Blue-breasted Fairy-wren) and *M. elegans* (Red-winged Fairy-wren). Two New Guinea species, *M. grayi* (Broad-billed Fairy-wren) and *M. cyanocephalus* (Emperor Fairy-wren), were variously associated with these two assemblages depending on the type of data analysis used. Within the first assemblage, *M. cyaneus* and *M. splendens* were sister species, which were in turn linked to *M. coronatus*. Within the *M. melanocephalus–leucopterus–alboscapulatus* group, the earliest split involved New Guinean *M. alboscapulatus*. The allozyme study also supported species recognition of *M. amabilis* relative to other members of the *M. lamberti* complex. Schodde and Mason (1999) maintained all Australian species of *Malurus* identified by the allozyme analyses. Consequently, the only changes to *Malurus* from Christidis and Boles (1994) is in the sequence of species to better reflect their relationships as now understood.

Protein allozyme data (Christidis and Schodde 1997) identified a sister relationship between *Stipiturus mallee* and *S. ruficeps*. This requires no change from the treatment in Christidis and Boles (1994).

Mayr (1986a) and Christidis and Boles (1994) listed eight species within *Amytornis*. Schodde and Mason (1999), subsequently expanded this to ten, by splitting *Amytornis ballarae* (Kalkadoon Grasswren) from *A. purnelli* (Dusky Grasswren) and *A. merrotsyi* (Short-tailed Grasswren) from *A. striatus* (Striated Grasswren). Those authors thought it probable that *A. purnelli-ballarae* were members of a superspecies, but noted plumage characters shared with other species of grasswren. Tentative species-level recognition of *Amytornis ballarae* is adopted here, although additional published data are still desirable. Species recognition of *A. merrotsyi* has support from an allozyme study (Christidis 1999). Based on the allozyme data and morphological characters, Christidis (1999) recognised the following three groups:

(1) *A. barbatus* (Grey Grasswren)

(2) *A. striatus*, *A. merrotsyi*, *A. woodwardi* (White-throated Grasswren), *A. dorotheae* (Carpentarian Grasswren)
(3) *A. textilis* (Thick-billed Grasswren), *A. purnelli-ballarae*, *A. goyderi* (Eyrean Grasswren) and possibly *A. housei* (Black Grasswren).

The study lacked material of *ballarae*. Only *A. barbatus* is sufficiently genetically diverged to warrant subgeneric recognition (see also Christidis and Schodde 1987 and Schodde and Mason 1999).

Christidis (1999) found that *myall* and *modestus* (both conventionally placed in *textilis*) differed at a level comparable to that between either from *A. purnelli* or *A. goyderi*. Because only a low level of allozyme variation was recorded within the group comprising *myall–modestus–purnelli–goyderi*, it was not deemed prudent to separate *myall* and *modestus* at that time. Black (2004) reviewed the morphological evidence among nominal subspecies of *A. textilis*. He concluded that the two species should be recognised: *A. textilis* (including subspecies *textilis* and *myall*) and *A. modestus*. Although this split is not incorporated into this list, the relationships among forms of *A. textilis* (*sensu lato*) need further investigation.

Schodde and Mason (1999) regarded *A. woodwardi* and *dorotheae* as a superspecies, and *A. striatus* and *merrotsyi* as another. Christidis (1997), however, did not confirm that *A. striatus* and *A. merrotsyi* were necessarily sister taxa. In light of the available allozyme and DNA evidence, Schodde and Mason (1999) are followed in recognising ten species of *Amytornis*, but their sequence is modified to better reflect the relationships revealed by allozyme data (Christidis 1997).

Malurus cyaneus	Superb Fairy-wren
Malurus splendens	Splendid Fairy-wren
Malurus coronatus	Purple-crowned Fairy-wren
Malurus melanocephalus	Red-backed Fairy-wren
Malurus leucopterus	White-winged Fairy-wren
Malurus lamberti	Variegated Fairy-wren
Malurus amabilis	Lovely Fairy-wren
Malurus pulcherrimus	Blue-breasted Fairy-wren
Malurus elegans	Red-winged Fairy-wren
Stipiturus malachurus	Southern Emu-wren
Stipiturus mallee	Mallee Emu-wren
Stipiturus ruficeps	Rufous-crowned Emu-wren
Amytornis barbatus	Grey Grasswren
Amytornis striatus	Striated Grasswren
Amytornis merrotsyi	Short-tailed Grasswren
Amytornis woodwardi	White-throated Grasswren
Amytornis dorotheae	Carpentarian Grasswren
Amytornis textilis	Thick-billed Grasswren
Amytornis purnelli	Dusky Grasswren
Amytornis ballarae	Kalkadoon Grasswren
Amytornis goyderi	Eyrean Grasswren
Amytornis housei	Black Grasswren

Family Dasyornithidae

Apart from segregating *Dasyornis* into a monotypic family (see Family delimitations and sequence in introductory discussion), no other inclusions or taxonomic changes have been made to the genus from the treatment in Christidis and Boles (1994).

Dasyornis brachypterus	Eastern Bristlebird
Dasyornis longirostris	Western Bristlebird
Dasyornis broadbenti	Rufous Bristlebird

Family Acanthizidae

Christidis and Boles (1994) followed the generic sequence in Schodde (1975) because no detailed and comprehensive study had been published on relationships within the family. While this remains the case, Schodde and Mason (1999) provided a more detailed assessment of morphological characters than that in Schodde (1975). Although there is yet much work to be done, in its absence the generic sequence of Schodde and Mason (1999) is adopted.

Schodde and Mason (1999) merged *Hylacola* (heathwrens) with *Calamanthus* (fieldwrens) and *Chthonicola* (*C. sagittata*; Speckled Warbler) with *Pyrrholaemus*

(*P. brunneus*; Redthroat). This is consistent with the preliminary protein allozyme and chromosomal data reported in Christidis (1990). Christidis and Boles (1994) did not take the step of combining these genera pending publication of more detailed data. While this still has not eventuated, Schodde and Mason (1999) cited several morphological characters in support of their treatment. These mergers may well prove valid, but more evidence is desirable before accepting them. Thus, the recognition of four genera, as was done in Christidis and Boles (1994), is retained here.

Schodde (1975) treated all forms of fieldwren (*fuliginosus*, *campestris*, *isabellinus*, *montanellus*) as a single species (*C. fuliginosus*), following Condon (1951). Parker and Eckert (1983) presented a case for accepting two species: *C. fuliginosus* (Striated Fieldwren) and *C. campestris* (Rufous Fieldwren; including *isabellinus* and *montanellus*). This was accepted by most subsequent authors (Mayr 1986b; Sibley and Monroe 1990; Christidis and Boles 1994). Schodde and Mason (1999) differentiated *C. fuliginosus* from *C. campestris*, which they further divided into two species, *C. montanellus* (south-western Australia) and *C. campestris* (Pilbara coast, Shark Bay Islands, central western Australia and South Australia through to Victorian mallee), although noting this action as provisional. This action was based on consideration of intergradient forms, loss of pigmentation and morphological criteria, but required a number of assumptions. Given the provisional nature of Schodde and Mason's (1999) treatment, the taxa *campestris* and *montanellus* are kept as a single species (*C. campestris*), pending further studies.

David and Gosselin (2002a) pointed out that the scientific name of the Large-billed Scrubwren should be correctly spelt *Sericornis magnirostra*. Schodde and Mason (1999) combined *Sericornis beccarii* (Tropical Scrubwren; Australia, New Guinea) with *S. magnirostra* (Australia) on the basis of hybridisation between *S. b. dubius* and *S. m. viridior* in the Cooktown region, north Queensland (unpublished information from J.R. Ford and R. Schodde in Schodde and Mason 1999), and mitochondrial DNA data in Joseph and Moritz (1993a) and Joseph *et al.* (1993); see also Boles (1979). The two individuals of *S. b. dubius* examined were closer in their mtDNA haplotypes to *S. m. viridior* than the latter was to *S. m. magnirostra*. The protein allozyme studies of Christidis *et al.* (1999) also identified a complex association between *S. beccarii*, *magnirostra* and *S. nouhuysi* (Large Scrubwren; New Guinea). Mayr (1986b) included *S. virgatus* (Perplexing Scrubwren; New Guinea) in *S. beccarii*, and Dickinson (2003) included both in *S. magnirostra*.

Schodde and Mason (1999) also suggested the possibility that the form *dubius* could be a stabilised hybrid population derived from three way integradation between *S. b. minimus*, *viridior* and a hypothetical cinnamomic *magnirostra–viridior* outlier. This complicated hypothesis lacks supporting evidence and implies that *dubius* is not a valid taxon, although it was still recognised by Schodde and Mason (1999). The status of New Guinean *S. nouhuysi* and *S. virgatus* was not considered in this revision. The morphological data presented do not provide compelling evidence in support of combining *S. beccarii* and *S. magnirostra*.

Similarly, the molecular data were derived from few individuals from a small section of the distribution of *S. beccarii*. Introgression and lineage sorting can obscure species relationships in recently evolved taxa such as the *beccarii–magnirostra–nouhuysi* complex. While it is quite possible that detailed molecular and morphological analyses of the whole complex will reveal that all are best treated as one species, the conventional treatment is retained here, which recognises *S. magnirostra*, *S. beccarii*, *S. nouhuysi* and *S. virgatus*.

Joseph and Mortiz (1993b) compared the mitochondrial DNA of several individuals of *Sericornis frontalis* (White-browed Scrubwren) and *S. keri* (Atherton Scrubwren) and obtained results that detected a low level of hybridisation between these taxa.

Based on the findings of Christidis and Schodde (1991b) that *humilis* – the

Tasmanian form of the *S. frontalis* complex – was the most distinct lineage, Christidis and Boles (1994) elevated it to species level. Schodde and Mason (1999) combined *S. humilis* with *S. frontalis*, disregarding the protein evidence and arguing that populations in the Kent group exhibit evidence of intergradation. These apparent intergrades were then recognised as the subspecies *flindersi*. The complex genetic interactions between populations in Tasmania, the mainland and intervening islands requires further investigation before their nature can be properly understood, but here *S. humilis* is tentatively retained as a separate species from *S. frontalis*. Relationships among the other subspecies currently recognised in *S. frontalis* need further examination. Mayr (1986b) treated *humilis*, *maculatus* and *frontalis* (including *laevigaster*) as three separate species, whereas the findings of Christidis and Schodde (1991b) indicated that *laevigaster* is the most diverged of the mainland forms. The treatment from Christidis and Boles (1994) is retained.

The generic name *Acanthornis* is feminine (David and Gosselin 2002b), so the scientific name of the Scrub-tit is correctly *Acanthornis magna*.

Schodde and Mason (1999) adopted the sequence in Wolters (1975–1981) for *Gerygone*, arguing that it was more consistent with the relationship estimates of Meise (1931) and Ford (1986a) than the order of Christidis and Boles (1994). Schodde and Mason (1999) combined the forms *insularis* (Lord Howe Island), *modesta* (Norfolk Island) and *igata* (New Zealand) as one species (*G. igata*; Grey Gerygone) following Meise (1931), but not Ford (1986a). The relationships between these island forms and *G. flavolateralis* (Fan-tailed Gerygone) of New Caledonia, Loyalty Islands, Vanuatu and Rennell Island needs further investigation. Ford (1986a) noted that *G. insularis* was closer to *G. flavolateralis* and *G. levigaster* (Mangrove Gerygone) than to *G. igata*. He also suggested that *G. modesta* was not conspecific with *G. igata* and could be closer to *G. levigaster.*

The north-western population of *Gerygone fusca* (Western Gerygone) was treated at the species level (*Gerygone mungi*, Desert Gerygone) by Storr (1977). In later publications (e.g. Storr 1980, 1985), he treated it as a subspecies of *G. fusca*, and it was regarded as a well-marked subspecies by Johnstone and Storr (2004).

Gould (1838) simultaneously published the names *olivacea* and *albogularis* (in combination with the generic name *Psilopus*) for the White-throated Gerygone (McAllan 2007). He subsequently (Gould 1848) wrote these in a manner that indicated that he adopted *albogularis* and regarded *olivaceus* to be a synonym of it. This constituted the action of first reviser (ICZN 1990, article 24.2), giving *albogularis* nomenclatural priority. It is then a question of whether this name can be rejected as a *nomen oblitum*, that is, that it has been unused for a sufficient period to be set aside for the more commonly used *olivacea*. Although *albogularis* has not been applied in the past half century at least, it was used consistently in the early 1900s and more sporadically until about the mid-1920s. This appears not to meet the requirements under the Code (ICZN 1999, Articles 23.9.11 and 23.9.1.2) under which this name can be set aside for a more junior one. The name *Gerygone albogularis* is accepted here.

Alteration of the specific epithet in *Gerygone chloronota* (from *chloronotus*) follows David and Gosselin (2002a).

The conclusions arising from the phylogenetic analysis of Ford (1986a) are followed here. Consequently, there are no inclusions or other taxonomic changes to *Gerygone* from the treatment in Christidis and Boles (1994), other than some alteration in the species sequence.

Schodde and Mason (1999) divided the Australian species of *Acanthiza* into four groups:

(1) *katherina* (Mountain Thornbill), *pusilla* (Brown Thornbill), *apicalis* (Inland Thornbill), *ewingii* (Tasmanian Thornbill)

(2) *uropygialis* (Chestnut-rumped Thornbill), *reguloides* (Buff-rumped Thornbill), *inornata* (Western Thornbill), *iredalei* (Slender-billed Thornbill), *chrysorrhoa* (Yellow-rumped Thornbill)
(3) *nana* (Yellow Thornbill), *lineata* (Striated Thornbill)
(4) *robustirostris* (Slaty-backed Thornbill).

New Guinean *murina* was not placed. Subsequently, those divisions were largely supported by mtDNA and nuclear DNA sequence analyses (Nicholls *et al*. 2000, Nicholls 2001), differing only by the recognition of *A. chrysorrhoa* as a fifth lineage that is the sister taxon of an assemblage comprising the sister lineages (1) and (2) (as defined above). *Acanthiza robustirostris* was interpreted as the earliest divergence within the genus and *A. murina* as the sister taxon to *A. nana*. The sequence adopted here is altered from that in Christidis and Boles (1994) to better reflect the DNA phylogeny.

Schodde and Mason (1999), like Schodde (1975) and Christidis and Boles (1994), recognised *A. pusilla* and *A. apicalis* as separate species. Evidence of introgression (Boles 1983, Norman 1987) led some authors to treat them as a single species (e.g. Schodde and Tidemann 1986; Sibley and Monroe 1990). Norman (1987) found that in areas of overlap there was parental preference for different habitats and recommended that the two be kept separate. Christidis and Boles (1994) followed this.

Schodde and Mason (1999) expanded on this with further evidence regarding the interactions of these forms where they approached or overlapped. More compelling evidence for keeping the two separate has come from DNA sequence data (Nicholls *et al*. 2000, Nicholls 2001), which placed *A. pusilla* and *A. katherina* as sister species, to the exclusion of *A. apicalis*.

The status of the brighter yellow form of *reguloides* (*squamata*) from north Queensland warrants further investigation.

Pycnoptilus floccosus	Pilotbird
Origma solitaria	Rockwarbler
Oreoscopus gutturalis	Fernwren
Sericornis citreogularis	Yellow-throated Scrubwren
Sericornis frontalis	White-browed Scrubwren
Sericornis humilis	Tasmanian Scrubwren
Sericornis keri	Atherton Scrubwren
Sericornis magnirostra	Large-billed Scrubwren
Sericornis beccarii	Tropical Scrubwren
Acanthornis magna	Scrubtit
Hylacola pyrrhopygia	Chestnut-rumped Heathwren
Hylacola cauta	Shy Heathwren
Calamanthus fuliginosus	Striated Fieldwren
Calamanthus campestris	Rufous Fieldwren
Pyrrholaemus brunneus	Redthroat
Chthonicola sagittata	Speckled Warbler
Smicrornis brevirostris	Weebill
Gerygone mouki	Brown Gerygone
Gerygone modesta	Norfolk Island Gerygone^{N}
Gerygone insularis	Lord Howe Gerygone$^{LH/E}$
Gerygone levigaster	Mangrove Gerygone
Gerygone fusca	Western Gerygone
Gerygone tenebrosa	Dusky Gerygone
Gerygone magnirostris	Large-billed Gerygone
Gerygone chloronota	Green-backed Gerygone
Gerygone palpebrosa	Fairy Gerygone
Gerygone albogularis	White-throated Gerygone
Acanthiza robustirostris	Slaty-backed Thornbill
Acanthiza lineata	Striated Thornbill
Acanthiza nana	Yellow Thornbill
Acanthiza chrysorrhoa	Yellow-rumped Thornbill
Acanthiza uropygialis	Chestnut-rumped Thornbill
Acanthiza reguloides	Buff-rumped Thornbill
Acanthiza inornata	Western Thornbill
Acanthiza iredalei	Slender-billed Thornbill
Acanthiza ewingii	Tasmanian Thornbill
Acanthiza apicalis	Inland Thornbill
Acanthiza pusilla	Brown Thornbill
Acanthiza katherina	Mountain Thornbill
Aphelocephala leucopsis	Southern Whiteface
Aphelocephala pectoralis	Chestnut-breasted Whiteface
Aphelocephala nigricincta	Banded Whiteface

Family Pardalotidae

Christidis and Boles (1994) accepted four species of pardalote: *Pardalotus punctatus* (Spotted Pardalote), *P. quadragintus* (Forty-spotted Pardalote), *P. rubricatus* (Red-browed Pardalote) and *P. striatus* (Striated Pardalote) – a treatment used by subsequent authors (e. g. Schodde and Mason 1999, Higgins and Peter 2003, Dickinson 2003). Owing to the often complex interactions between named populations in the *punctatus* and *striatus* complexes, the best taxonomic treatments for these remain unresolved.

The Yellow-rumped Pardalote (*xanthopyge* – note that this, not *xanthopygus*, is the correct spelling) has been maintained by some authors as a species separate from *punctatus*. On the basis of hybridisation, however, most recent authors have regarded them as conspecific (e.g. Short *et al.* 1983; Woinarski 1984; Ford 1987, Schodde and Tidemann 1986 and Sibley and Monroe 1990). The relationships between south-eastern and south-western populations of *punctatus* and the intervening *xanthopyge* have not been resolved.

Likewise, *striatus* can be separated into striped-crown (*striatus*, *ornatus*, *substriatus*) and black-crowned (*melanocephalus*, *uropygialis*) groups. Two to five species have at times been recognised, but recent practice has been to unite them as one species. Intergradation within and between the two groups has been documented, but the extent and nature of these interactions are not well understood.

Schodde and Mason (1999) discussed the plumages and intergradation in both groups, but little other new evidence pertaining to the taxonomy of either species has been published since Christidis and Boles (1994). No changes are made to the treatment in that work.

Pardalotus punctatus	Spotted Pardalote
Pardalotus quadragintus	Forty-spotted Pardalote
Pardalotus rubricatus	Red-browed Pardalote
Pardalotus striatus	Striated Pardalote

Family Meliphagidae

Parker's (1973) proposal that the Australian chats (Epthianuridae) were closest to the Meliphagidae has been confirmed (DNA–DNA hybridisation, protein allozyme studies, microcomplement fixation; DNA sequences; Sibley and Ahlquist 1985, 1990; Baverstock *et al.* 1991; Christidis and Schodde 1991a; Christidis *et al.* 1993; Driskell and Christidis 2004). Christidis and Boles (1994) followed Sibley *et al.* (1988) and Sibley and Ahlquist (1990) in merging these families.

The sequence and composition of genera within the Meliphagidae are still far from resolved, and the few recent classifications of the entire family (Salomonsen 1967a; Wolters 1972–85; Dickinson 2003) have not been accompanied by published documentation of the arrangement adopted. For Australian taxa, Schodde (1975) made several changes to the sequence and generic limits in the classification of Salomonsen (1967a). Christidis and Boles (1994) largely adopted the arrangement of Schodde (1975), but acknowledged that there were some difficulties.

Several major generic level issues raised by Schodde (1975) and succeeding authors were considered by Christidis and Boles (1994). Storr (1977, 1984) placed *Entomyzon cyanotis* in *Melithreptus* without providing reasons. The two genera were aligned by the limited DNA–DNA hybridisation data on the Meliphagidae (Sibley and Ahlquist 1985, 1990), although they were kept separate by subsequent authors (e.g. Christidis and Boles 1994). Schodde (1975) segregated *Xanthotis* and *Lichenostomus* from the traditional *Meliphaga* (*sensu lato*). Although the reasons presented were cursory and allocations of some species were arguable, the general divisions were supported by allozyme studies (Christidis and Schodde 1993). Boles and Longmore (1985) advocated separating *Phylidonyris melanops* (Tawny-crowned Honeyeater) into the monotypic genus *Gliciphila*. Christidis and Boles (1994) regarded this treatment as premature until the affinities of the other

Australian yellow-winged species and South Pacific *P. undulata* and *P. notabilis* were better established. Schodde (1975) transferred monotypic *Lacustroica* (*L. whitei*; Grey Honeyeater) to *Conopophila*, although he noted several differences between these taxa; this was adopted by Christidis and Boles (1994), who noted that the validity of this action required testing. The merger of *Cissomela* (*pectoralis*, Banded Honeyeater; *niger*, Black Honeyeater) into monotypic *Certhionyx* (*variegatus*, Pied Honeyeater) by Schodde (1975) and Schodde and McKean (1976) was followed by Christidis and Boles (1994) to maintain consistency with current usage, but was not regarded as a satisfactory solution. An alternative to this treatment would have been to keep each species in its own monospecific genus, as was done by Salomonsen (1967a): *Certhionyx* (*variegatus*), *Cissomela* (*pectoralis*) and *Sugomel* (*niger*).

Sibley and Monroe (1990) used a novel classification, unlike that of Salomonsen (1967a) or Schodde (1975). Schodde and Mason (1999) maintained most of the same classification as Schodde (1975) and Christidis and Boles (1994), other than some modification of the generic sequence, changes in generic allocations of two species, the merger of one species and a split of another (see discussions below). The list in Dickinson (2003) reflected that of Schodde and Mason (1999) for the Australian taxa.

A recent DNA sequence study by Driskell and Christidis (2004) using three mitochondrial genes and one nuclear intron provided the most comprehensive revision of relationships within the Meliphagidae. They demonstrated that the family was monophyletic with several major clades. Some of the branches within these clades were robust, but others lacked much statistical support. Together with limited taxon sampling for some genera, this meant that resolution of the internal branching patterns of the clades was not strong.

Acanthorhynchus (spinebills) was the sister taxon to all remaining honeyeaters. Within the remaining Meliphagidae, four main clades could be discerned, although relationships between them and subdivisions within them were often poorly defined. Each major clade contained both large and small bodied forms. The genera *Anthochaera*, *Phylidonyris* and *Certhionyx* were shown not to be monophyletic.

The first clade grouped *Acanthagenys* (*A. rufogularis*, Spiny-cheeked Honeyeater), *Anthochaera* (wattlebirds), *Zanthomiza* (*Z. phrygia*, Regent Honeyeater), *Phylidonyris albifrons* (White-fronted Honeyeater), *Lichenostomus* (represented only by *L. flavescens*, Yellow-tinted Honeyeater), *Manorina* (miners), *Certhionyx variegatus* (Pied Honeyeater), New Guinean *Melidectes* and *Pycnopygius*, and New Zealand *Prosthemadera*. The only strongly supported subclades were *Manorina* with *Melidectes* and an *Anthochaera–Xanthomyza–Acanthagenys* assemblage (Driskell and Christidis 2004).

Schodde and Mason (1999) and Johnstone (2001) separated *Anthochaera chrysoptera* (Little Wattlebird) and *A. lunulata* (Brush Wattlebird) as separate species, and this is supported by DNA sequence data (Driskell and Christidis 2004). The DNA sequence data also placed monotypic *Zanthomiza* (*Z. phrygia*) within *Anthochaera*. (Note that McAllan [2007] argued that *Zanthomiza* Swainson, 1837, is valid and available, and cannot be suppressed in favour of *Xanthomyza*, Strickland 1841.) *Zanthomiza* was linked to *A. carunculata* (Red Wattlebird) and *A. paradoxa* (Yellow Wattlebird); these three taxa formed a well-supported group relative to *A. chrysoptera* and *A. lunulata*. In order to avoid the recognition of paraphyletic genera, two options are available: (1) *Zanthomiza* can be combined into *Anthochaera* Vigors and Horsfield, 1827 or (2) *A. carunculata* and *A. paradoxa* can be placed in a separate genus for which the name *Dyottornis* Mathews, 1912, is available. Driskell and Christidis (2004) recommended merging *Zanthomiza* (as *Xanthomyza*) as a subgenus into *Anthochaera*, and this is followed here

Meliphaga, *Lichenostomus* and *Xanthotis* do not form a monophyletic assemblage as conventionally assumed (Schodde 1975; Christidis and Schodde 1993; Christidis and Boles 1994). Both *Meliphaga* and *Lichenostomus* were aligned with the *Anthochaera–Melidectes–Manorina* complex described above, while *Xanthotis* is in a different clade. The small number of species of each genus sampled (two *Meliphaga*, one *Lichenostomus*, one *Xanthotis*), plus low resolution among branches prevented any definitive conclusions about the relationships between them. The association of *P. albifrons* with this assemblage, rather than the other species conventionally placed in *Phylidonyris*, necessitates that it is segregated in its own genus. The available generic name is *Purnella* Mathews, 1914.

In the second clade, the epthianurine chats (*Epthianura*, *Ashbyia*) form a strongly supported subclade. Christidis and Boles (1994) and Schodde and Mason (1999) followed Sibley and Monroe (1990) by placing these genera last in the linear sequence to reflect the uncertainty of their exact position in the Meliphagidae. It is now apparent that the chats are embedded in the Meliphagidae.

Also in this clade are *Ramsayornis* (*fasciatus*, Bar-breasted Honeyeater; *modestus*, Brown-backed Honeyeater) and *Conopophila* (*albogularis*, Rufous-banded Honeyeater; *rufogularis*, Rufous-throated Honeyeater), which were identified as sister lineages by DNA sequence data (Driskell and Christidis 2004). Unfortunately, *Conopophila whitei* was not examined in that study. Johnstone (2001) and Johnstone and Storr (2004) retained this species in monotypic *Lacustroica*. Schodde and Mason (1999) conceded that its position is poorly resolved, but still followed Schodde (1975) in maintaining it in *Conopophila* (see also Sibley and Monroe 1990; Dickinson 2003). Since there has been no new evidence published relevant to this issue since Christidis and Boles (1994), that classification is retained here.

The New Guinean genera *Melipotes*, *Melilestes* and *Timeliopsis* were also in the second clade as a fairly well-supported subclade (Driskell and Christidis 2004).

Clade three had two subclades: a robust one including *Certhionyx niger* and *Myzomela*, and a loosely supported one with *Glycichaera* (*G. fallax*, Green-backed Honeyeater), *Ptiloprora* (New Guinea) and *Phylidonyris melanops* (Driskell and Christidis 2004).

The relationships of the three Australian species of *Myzomela* with extra-limital forms have not been investigated and warrant attention. *Myzomela obscura* (Dusky Honeyeater) is regarded as closely related to *M. blassi* (Drab Myzomela; southern Moluccas) (White and Bruce 1986) and *M. albigula* (White-chinned Myzomela; Louisiade Archipelago, New Guinea) and has sometimes been considered as conspecific with them (Rothschild and Hartert 1907). Similarly, *M. erythrocephala* (Red-headed Honeyeater) has at times been combined at species level with two forms from the Lesser Sunda Islands, *M. dammermani* (Sumba Myzomela) (White and Bruce 1986) and *M. kuehni* (Crimson-hooded Myzomela) (Koopman 1957), whereas others treatments retain each as species (Sibley and Monroe 1990). Whether *Myzomela sanguinolenta* (Scarlet Honeyeater) and *M. caledonica* (New Caledonian Myzomela) are distinct species is an as yet unresolved issue. They are commonly treated as a single species (Schodde and Mason 1999), to which related populations in Wallacea are sometimes also included (e.g. White and Bruce 1986). Other members of the *sanguinolenta*-group occur in Micronesia and Polynesia.

Schodde and Mason (1999) combined *Glycichaera* with New Guinean *Timeliopsis* on the basis of suggested similarities in external form and the structures of skull and tongue. Although several characters were listed, they were not placed in any phylogenetic or systematic context when compared with other genera of honeyeaters. The DNA sequence data (Driskell and Christidis 2004) rejected an association between *Timeliopsis* and *Glycichaera*. The morphological similarities between these taxa appear to be convergent.

Schodde and Mason (1999) recognised *Gliciphila* for *melanops*, as had been proposed by Boles and Longmore (1985). This action had previously been rejected by Sibley and Monroe (1990) on the basis of a personal communication from R. Schodde that there was no good division between *melanops* and other species placed in *Phylidonyris*. The separation of *Gliciphila* from *Phylidonyris* was demonstrated by Driskell and Christidis (2004).

The fourth clade had three well-supported subclades. One included *Certhionyx pectoralis*, *Lichmera*, *Trichodere cockerelli* (White-streaked Honeyeater) and *Phylidonyris* (*sensu stricto*) as a monophyletic group (Driskell and Christidis 2004). The association of the last three corroborated the morphologically based suggestions put forward by Schodde (1975). Schodde (1975) also aligned *Grantiella* (*G. picta*; Painted Honeyeater) with this assemblage, but that action was not supported by the DNA sequence data (Driskell and Christidis 2004) (see below).

Although Schodde and Mason (1999) conceded that the evidence cited for including *pectoralis*, *niger* and *variegatus* in *Certhionyx* was 'flimsy' at best, they still advocated recognition of the genus. Driskell and Christidis (2004) found that these species were not closely related: each falling in a different clade of honeyeaters. Each species belongs in its own monotypic genus. Consequently the species placed in *Certhionyx* by Schodde (1975) are here recognised as *Cissomela pectoralis*, *Certhionyx variegatus* and *Sugomel niger*.

The DNA sequence data (Driskell and Christidis 2004) clearly demonstrated that the *Phylidonyris* is polyphyletic. *Phylidonyris albifrons* and *P. melanops* are not close to the other three species and are segregated into monotypic genera (see above). With their removal, *Phylidonyris* has only three species: *pyrrhopterus* (Crescent Honeyeater), *novaehollandiae* (New Holland Honeyeater) and *niger* (White-cheeked Honeyeater). The specific epithets are altered to reflect the masculine gender of *Phylidonyris* (David and Gosselin 2002a).

Grantiella was found to associate weakly with *Plectorhyncha* and *Xanthotis* (represented by *flaviventer*, Tawny-breasted Honeyeater) and less closely with *Philemon* (friarbirds), although this clade had limited statistical support. Nevertheless, there was no support for an association between *Grantiella* and the *Phylidonyris–Lichmera–Trichodere* complex.

DNA–DNA hybridisation data (Sibley and Ahlquist 1990) aligned *Entomyzon* (*E. cyanotis*; Blue-faced Honeyeater) with *Melithreptus*. Schodde and Mason (1999) suggested that *Entomyzon* formed a separate lineage in a complex that included *Manorina* and *Melithreptus*. DNA sequence data (Driskell and Christidis 2004) clearly support a sister relationship between *Entomyzon* and *Melithreptus,* but not between these two genera and *Manorina*. Although *Entomyzon* and *Melithreptus* are clearly a monophyletic group with no obvious close relatives, they are not combined generically (*contra* Storr 1977, 1984; Johnstone 2001; Johnstone and Storr 2004), given the morphological distinctiveness of the two groups.

Norman *et al.* (2006) examined relationships within *Meliphaga* using 1580 base pairs of mitochondrial and nuclear DNA. Species in this genus fall into two groups. One consists of *M. lewinii* (Lewin's Honeyeater), *M. notata* (Yellow-spotted Honeyeater) and *M. aruensis* (Puff-backed Honeyeater; New Guinea; populations under this name embody more than one species). The remaining species, including the other Australian taxa, comprised the second lineage. *Meliphaga gracilis* (Graceful Honeyeater), which is found in north Queensland and New Guinea, was found to constitute two species. Populations in Australia and the Trans-Fly region of New Guinea retain the name *M. gracilis*. Those in south-eastern New Guinea take the name *M. cinereifrons*, with the English name Elegant Honeyeater. The forms of *Meliphaga albilineata* (White-lined Honeyeater) in the Northern Territory and the Kimberley region differed at levels commensurate with species recognition for each. Christidis and Schodde (1993) obtained similar results using allozymes. The name *M. albilineata* applies to birds in the Northern Territory. The Western Australian population becomes *M. fordiana* (Kimberley Honeyeater).

Lichenostomus fasciogularis (Mangrove Honeyeater) and *L. versicolor* (Varied Honeyeater) were maintained as distinct by Schodde (1975), whereas Ford (1978) believed that they are conspecific because of hybridisation in a narrow zone near Townsville (based on a small number of specimens). Ford's (1978) proposal was accepted by Schodde and Tidemann (1986), but not by Schodde *et al.* (1982) or Sibley and Monroe (1990). Plumage similarities of some New Guinean populations of *L. versicolor* to *L. virescens* (Keast 1961) led Christidis and Boles (1994) to recognise all as separate species until relationships between them were better resolved. Schodde and Mason (1999) also kept these as separate species, suggesting that intergradation between *versicolor* and *fasciogularis* was limited, possibly because of lower fitness of the hybrid birds.

Lichenostomus fuscus (Fuscous Honeyeater) and *L. flavescens* (Yellow-tinted Honeyeater) were kept separate by Schodde (1975), who placed them in different species-groups. In a detailed study, Ford (1986b) suggested the two had a sister relationship (also Schodde 1982a). Schodde and Tidemann (1986) combined the two, following Salomonsen (1967a). Parker (1971a) stressed differences in the ecology of the two, and Ford (1986b) determined that there was no evidence of intergradation where their ranges approach. Both were retained as species by Christidis and Boles (1994) – an action also followed by Schodde and Mason (1999) and here.

Schodde (1982), Schodde and Tidemann (1986), and Sibley and Monroe (1990) included *Manorina melanotis* in *M. flavigula* on the basis of extensive hybridisation reported by Joseph (1986), who nonetheless argued for species-level recognition of *melanotis*. Species-level distinction of *melanotis* was also followed by Christidis and Boles (1994) because of the significant ecological and behavioural differences (Clarke *et al.* 2001). Schodde and Mason (1999) presented arguments for combining *Manorina melanotis* with *M. flavigula*; however, the evidence does not appear sufficiently compelling to accept this action without additional support.

The taxonomy of the *Melithreptus gularis–laetior* (Black-chinned/Golden-backed Honeyeater) complex is still unresolved. These were combined by Schodde (1975), but Ford (1986b) cited ecological and morphological differences that suggested separation at the species level, although he was equivocal about their status. Mees (1961) and Sibley and Ahlquist (1990) maintained them as separate species. Schodde and Mason (1999) maintained the two taxa as one species, although they conceded that the issue cannot be resolved with the patchy material available. More specimens and molecular studies are needed before a change is made to the treatment in Christidis and Boles (1994).

Johnstone (2001) and Johnstone and Storr (2004) separated the Western Australian form of *Melithreptus lunatus* at specific level as *M. chloropsis* (Western White-naped Honeyeater) as members of a superspecies that also includes *M. affinis* (Black-headed Honeyeater) of Tasmania. This form is readily distinguishable from eastern *lunatus* in size, bill shape and eye skin colour, although less so than the differences that distinguish *M. gularis* and *M. laetior*. Despite merit in this treatment, it is not followed here pending further work on species/subspecies differentiation within *Melithreptus* as a whole.

The two widely separated subspecies of *Phylidonyris niger* – *niger* (New South Wales and Queensland) and *gouldi* (south-western Western Australia) – are distinct in bill shape and plumage and were treated as separate species by Gadow (1884). Their species status warrants investigation.

Species circumscription within *Philemon* is still unresolved (Christidis and Boles 1994). Schodde and Mason (1999) continued to treat the *buceroides-novaeguineae* ('Helmeted' Friarbird) group as one species, but with reservations. DNA sequence data to date (Driskell and Christidis 2004) have focussed only on species-level relationships of five species. The data reveal a sister relationship between *P. corniculatus* (Noisy Friarbird) and *P. argenticeps* (Silver-crowned Friarbird), whereas Schodde and Mason (1999) placed these two in separate subgenera. In turn, these were aligned with *P. buceroides*. Further work is needed on the entire genus before recommending changes to the prevailing taxonomy for Australian taxa (Christidis and Boles 1994; Schodde and Mason 1999).

The adopted sequence of genera of Australian honeyeaters follows that implied by the phylogeny of Driskell and Christidis (2004). The sequence of species included in this study also arises from that work. Otherwise, the sequence in Christidis and Boles (1994) is retained.

Acanthorhynchus tenuirostris	Eastern Spinebill
Acanthorhynchus superciliosus	Western Spinebill
Certhionyx variegatus	Pied Honeyeater
Meliphaga lewinii	Lewin's Honeyeater
Meliphaga notata	Yellow-spotted Honeyeater
Meliphaga gracilis	Graceful Honeyeater
Meliphaga albilineata	White-lined Honeyeater
Meliphaga fordiana	Kimberley Honeyeater
Lichenostomus frenatus	Bridled Honeyeater
Lichenostomus hindwoodi	Eungella Honeyeater
Lichenostomus chrysops	Yellow-faced Honeyeater
Lichenostomus virescens	Singing Honeyeater
Lichenostomus versicolor	Varied Honeyeater
Lichenostomus fasciogularis	Mangrove Honeyeater
Lichenostomus unicolor	White-gaped Honeyeater
Lichenostomus flavus	Yellow Honeyeater
Lichenostomus leucotis	White-eared Honeyeater
Lichenostomus flavicollis	Yellow-throated Honeyeater
Lichenostomus melanops	Yellow-tufted Honeyeater
Lichenostomus cratitius	Purple-gaped Honeyeater
Lichenostomus keartlandi	Grey-headed Honeyeater
Lichenostomus ornatus	Yellow-plumed Honeyeater
Lichenostomus plumulus	Grey-fronted Honeyeater
Lichenostomus fuscus	Fuscous Honeyeater
Lichenostomus flavescens	Yellow-tinted Honeyeater
Lichenostomus penicillatus	White-plumed Honeyeater
Purnella albifrons	White-fronted Honeyeater
Manorina melanophrys	Bell Miner
Manorina melanocephala	Noisy Miner
Manorina melanotis	Black-eared Miner
Manorina flavigula	Yellow-throated Miner
Acanthagenys rufogularis	Spiny-cheeked Honeyeater
Anthochaera lunulata	Western Wattlebird
Anthochaera chrysoptera	Little Wattlebird
Anthochaera phrygia	Regent Honeyeater
Anthochaera carunculata	Red Wattlebird
Anthochaera paradoxa	Yellow Wattlebird
Ramsayornis modestus	Brown-backed Honeyeater
Ramsayornis fasciatus	Bar-breasted Honeyeater
Conopophila albogularis	Rufous-banded Honeyeater
Conopophila rufogularis	Rufous-throated Honeyeater
Conopophila whitei	Grey Honeyeater
Epthianura tricolor	Crimson Chat
Epthianura aurifrons	Orange Chat
Epthianura crocea	Yellow Chat
Epthianura albifrons	White-fronted Chat
Ashbyia lovensis	Gibberbird
Sugomel niger	Black Honeyeater
Myzomela obscura	Dusky Honeyeater
Myzomela erythrocephala	Red-headed Honeyeater
Myzomela sanguinolenta	Scarlet Honeyeater
Glycichaera fallax	Green-backed Honeyeater
Gliciphila melanops	Tawny-crowned Honeyeater
Cissomela pectoralis	Banded Honeyeater
Lichmera indistincta	Brown Honeyeater
Phylidonyris pyrrhopterus	Crescent Honeyeater
Phylidonyris novaehollandiae	New Holland Honeyeater
Phylidonyris niger	White-cheeked Honeyeater
Trichodere cockerelli	White-streaked Honeyeater
Melithreptus gularis	Black-chinned Honeyeater
Melithreptus validirostris	Strong-billed Honeyeater
Melithreptus brevirostris	Brown-headed Honeyeater

Melithreptus albogularis	White-throated Honeyeater
Melithreptus lunatus	White-naped Honeyeater
Melithreptus affinis	Black-headed Honeyeater
Entomyzon cyanotis	Blue-faced Honeyeater
Philemon buceroides	Helmeted Friarbird
Philemon argenticeps	Silver-crowned Friarbird
Philemon corniculatus	Noisy Friarbird
Philemon citreogularis	Little Friarbird
Xanthotis macleayanus	Macleay's Honeyeater
Xanthotis flaviventer	Tawny-breasted Honeyeater
Plectorhyncha lanceolata	Striped Honeyeater
Grantiella picta	Painted Honeyeater

Family Pomatostomidae

Separation of *Pomatostomus* from the timaliid babblers and recognition at family level – initially proposed by Schodde (1975) and followed by Christidis and Boles (1994) – is supported by the DNA–DNA hybridisation evidence of Sibley and Ahlquist (1985, 1990).

Pomatostomus halli (Hall's Babbler) most closely resembles *P. superciliosus* (White-browed Babbler) in plumage, but is more closely related to *P. temporalis* (Grey-crowned Babbler) based on mitochondrial DNA studies (Edwards and Wilson 1990). It is here placed between these species in the sequence to reflect these divergent similarities.

Possible species level differences between *Pomatostomus temporalis temporalis* (eastern Australia) and *P. t. rubeculus* ('Red-breasted Babbler'; northern and western Australia) still require further investigation. Edwards and Wilson (1990) and Edwards (1993) recorded significant mitochondrial DNA differentiation, but sampling is required from the zone of contact.

Pomatostomus temporalis	Grey-crowned Babbler
Pomatostomus halli	Hall's Babbler
Pomatostomus superciliosus	White-browed Babbler
Pomatostomus ruficeps	Chestnut-crowned Babbler

Family Orthonychidae

Joseph *et al.* (2001) and Norman *et al.* (2002) showed that the Australian and New Guinean populations conventionally placed in *Orthonyx temminckii* (Logrunner) represented two species and were not necessarily sister species within the genus. This does not affect the species recognised in Australia, other than to require amendment of the name Logrunner to Australian Logrunner, to contrast with New Guinean Logrunner for *O. novaeguineae*.

Orthonyx temminckii	Australian Logrunner
Orthonyx spaldingii	Chowchilla

Family Psophodidae

The gender of *Cinclosoma* is neuter. Sibley and Monroe (1990: 457) used *castanotus* rather than *castanotum* for the Chestnut Quail-thrush because they regarded the specific epithet to be a noun in apposition, rather than an adjective, which therefore would not take the neuter suffix. This was followed by Christidis and Boles (1994). David and Gosselin (2002a) showed that this should be correctly written as *castanotum*.

Four species of *Cinclosoma* are generally accepted for Australia (e.g. Ford 1983; Christidis and Boles 1994; Schodde and Mason 1999), although further work on relationships between *C. castaneothorax* (Chestnut-breasted Quail-thrush) and *C. cinnamomeum* (Cinnamon Quail-thrush) is desireable. The degree of hybridisation between nominotypical forms of *castaneothorax* and *cinnamomeum* is an issue that needs resolution.

Christidis and Boles (1994) followed the species sequence of Ford (1983). Schodde and Mason (1999) altered this by placing *C. castaneothorax* before *C. cinnamomeum*. Their reasoning was that it was more concordant with Ford's (1983) phenograms. Because these are sister taxa in those phenograms, neither is any closer to *C. castanotum* or *C. punctatum* (Spotted Quail-thrush). Here the original sequence of Ford (1983) is retained.

The proper taxonomic rank for the form *alisteri* (Nullarbor Quail-thrush) remains unsettled. Macdonald (1968) treated it as a subspecies of *C. castanotum*; Ford (1983) and Schodde and Mason (1999) regarded it as conspecific with *C. cinnamomeum*; and Ford (1970, 1976) and Johnstone and Storr (2004) separated it at species level. Here is is placed in *C. cinnamomeum*.

Schodde and Mason (1999) divided *Psophodes nigrogularis* (Western Whipbird) into two species: monotypic *Psophodes nigrogularis* (*sensu stricto*) (extreme south-western Australia) and *P. leucogaster*, with three subspecies (*oberon*, south-western Australia; *lashmari*, Kangaroo Island; and *leucogaster*, central southern Australia). This action was based on a reconsideration of the data in Schodde and Mason (1991). However, the reasons given for this do not make a compelling case, including dismissal of a conflicting plumage trait as ancestral and of little phylogenetic significance without an appropriate analysis to test this notion. Here, *nigrogularis* and *leucogaster* are maintained as a single species pending further evidence (see also Johnstone and Storr 2004).

Cinclosoma punctatum	Spotted Quail-thrush
Cinclosoma castanotum	Chestnut Quail-thrush
Cinclosoma cinnamomeum	Cinnamon Quail-thrush
Cinclosoma castaneothorax	Chestnut-breasted Quail-thrush
Psophodes olivaceus	Eastern Whipbird
Psophodes nigrogularis	Western Whipbird
Psophodes cristatus	Chirruping Wedgebill
Psophodes occidentalis	Chiming Wedgebill

Family Neosittidae

Although Sibley and Monroe (1990) included *Daphoenositta* (sittellas) in their expanded Pachycephalinae, Christidis and Boles (1994) and Schodde and Mason (1999) retained this genus in the family Neosittidae. Recent DNA sequence data (detailed under Pachycephalidae; see below) call into question the treatment in Sibley and Monroe (1990).

Scott (1997) undertook a mitochondrial DNA study on the affinities within the *Daphoenositta* complex, although he stopped short of revising the genus. His findings did not reflect current taxonomic designations. According to his results, *Daphoenositta chrysoptera* (Varied Sittella) was found to be paraphyletic with respect to *D. miranda* (Black Sittella; New Guinea). In particular, *D. c. leucoptera* (north-west Australia) and *D. miranda* were sister taxa. Another pair of sister taxa are *D. c. chrysoptera* (south-east Australia) and *D. c. leucocephala* (east Queensland). Aligned with these was *Daphoenositta papuensis* (New Guinea), which is usually treated as a distinct species from *D. chrysoptera* (e.g. Schodde and Mason 1999; Dickinson 2003). Both *D. c. pileata* (south-west and central Australia) and *D. c. striata* (north-east Australia) are somewhat further removed from other forms and each other. Because Scott's (1997) analysis was not primarily geared towards resolving taxonomic relationships, no changes are made to the treatment of Christidis and Boles (1994) and Schodde and Mason (1999) in recognising two species in *Daphoenositta*: *D. chrysoptera* and *D. miranda*. Additional work on this group is still badly needed.

Daphoenositta chrysoptera	Varied Sittella

Family Campephagidae

The sequence of species of *Coracina* advocated by Schodde and Mason (1999) is followed here, although not entirely for the reasons they gave. Arguments about the centre of cuckoo-shrike radiation (Australo–Papua–Wallacea versus south-east Asia) lack sufficient data on which to make a decision. Within *Coracina* as currently defined (Sibley and Monroe 1990; Christidis and Boles 1994; Schodde and Mason 1999; Dickinson 2003), the subgenera *Pteropodocys* and *Edoliisoma* could arguably be treated as separate genera, as was long the practice. Placing these taxa at the start and end, respectively, of the species sequence ensures stability in the sequence should future revisions recognise more genera. Schodde and Mason (1999) rightly point out that, based on appearance, *C. novaehollandiae* and *C. papuensis* are more similar to each other than they are to *C. lineata* and should be adjacent to each other in sequence.

Schodde and Mason (1999) briefly discussed the species limits of *C. novaehollandiae* relative to other members of the complex, although this problem has yet to attract any detailed study. Elevation of several extralimital forms to species level does not affect the treatment of Australian birds. Most recent authors have followed Sibley and Monroe (1990): e.g. Christidis and Boles (1994), Schodde and Mason (1999) and Dickinson (2003).

Species limits within the broad *Coracina tenuirostris* (Cicadabird) complex as delimited by Mayr and Greenway (1960) are still unresolved (summarised in Schodde and Mason 1999). According to the limits followed by Christidis and Boles (1994), Schodde and Mason (1999) and Dickinson (2003), *C. tenuirostris* extends from Australia and New Guinea to the Bismarck Archipelago, Sulawesi and Micronesia. White and Bruce (1986), Sibley and Monroe (1990) and Coates and Bishop (1997) separated several of the Wallacean forms at the species level.

Holmes (1999) proposed that, based on call types, there were two species of Cicadabird present on the Atherton Tableland in the breeding season. These were also separated by habitat preferences with only marginal overlap. Some birds had faster calls, similar to those of birds breeding in south-eastern Australia. These inhabit mainly woodlands and open forest. The other type was primarily found in rainforest, mangroves and coastal shrublands, and had slower calls. Birds with this call type extend through Cape York Peninsula and also occur in the Northern Territory and possibly Wallacea, based on written descriptions (Coates and Bishop 1997). If Australian forms are split, then the name *tenuirostris* Jardine, 1831, applies to birds from the south-east. It is premature to take such action, but there is an obvious need for more detailed examination of this situation.

Sibley and Monroe (1990) used the English name Slender-billed Cicadabird for *C. tenuirostris*, whereas White and Bruce (1986) and Coates and Bishop (1997) used Common Cicadabird. Since *C. tenuirostris* (*sensu lato*) is not split here, a qualifier is not required for the English name.

Christidis and Boles (1994) followed Schodde (1975), who treated *Lalage tricolor* (Australia and New Guinea) and *L. sueurii* (Indonesia: Timor) as conspecific, although other authors (e.g. White and Bruce 1986; Mees 1986; Sibley and Monroe 1990; Coates and Bishop 1997; Schodde and Mason 1999; Dickinson 2003; Johnstone and Storr 2004) have treated the two as separate species. Analogous distributions occur in *Geopelia striata* and *Taeniopygia guttata*, both of which require more rigorous analysis. In the absence of detailed studies, each of these cases is treated in the same fashion: recognition of Australian populations as conspecific with those populations to the north. Thus, *L. tricolor* and *L. sueurii* are here treated as one species, under the latter name, until the treatment can be confirmed.

A possible sighting of *Coracina personata* (Wallacean Cuckoo-shrike) from Ashmore Reef awaits assessment (Dooley 2007a), so it is included in the supplementary list.

Coracina maxima	Ground Cuckoo-shrike
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Coracina personata	Wallacean Cuckoo-shrike$^{S(A)}$
Coracina papuensis	White-bellied Cuckoo-shrike
Coracina lineata	Barred Cuckoo-shrike
Coracina tenuirostris	Cicadabird
Lalage sueurii	White-winged Triller
Lalage leucomela	Varied Triller
Lalage leucopyga	Long-tailed Triller$^{N/E}$

Family Pachycephalidae

There remains uncertainty regarding the affinities of some taxa included in the Pachycephalidae (as recognised here), as well as relationships among genera. The Pachycephalidae were segregated into several families by Dickinson (2003), who then separated them in the linear sequence. This rearrangement is not followed in the absence of supporting evidence. There is some indication (Barker *et al.* 2004) that *Oreoica* (*O. gutturalis*; Crested Bellbird) is more closely related to *Colluricincla* (shrike-thrushes) than to either *Falcunculus* (*F. frontatus*; Crested Shrike-tit) or *Pachycephala* (whistlers). It is transferred from a position between the last two genera to the end of the sequence following *Colluricincla*. *Falcunculus* may be in a separate lineage from the other members as well – it is retained in a conventional position at the beginning of the sequence (e.g. Mayr 1967; Schodde 1975; Sibley and Monroe 1990; Christidis and Boles 1994). There are several subgroups within the Australian species of *Pachycephala* (Boles 1990; Schodde and Mason 1999). The sequence of species of whistlers is modified from that in Christidis and Boles (1994) – who followed Schodde (1975) – to that of Schodde and Mason (1999), which better reflects their presumed relationships.

Schodde (1975) kept the three populations of *Falcunculus frontatus* – *frontatus* (E Australia), *leucogaster* (SW Australia) and *whitei* (N Australia) – as one species, following Mayr (1953). Christidis and Boles (1994), likewise, admitted a single species. Schodde and Mason (1999) elevated each subspecies to species level, in which they were followed by Dickinson (2003). Their reasoning was based on differences in proportions of the tails and shapes of the wings, together with differences in size and plumage. Whether these are by themselves sufficient reason to accept three species is uncertain. The status of the three allopatric populations of *Falcunculus* should be compared using appropriate molecular methods. Until such time, only one species is tentatively accepted here, but the problem is flagged as being of considerable importance because of the conservation issues associated with northern and south-western birds.

Systematic relationships within the *Pachycephala simplex–griseiceps* complex are yet to be resolved. Apart from Sibley and Monroe (1990), who kept the two as separate species, most recent treatments (e.g. Christidis and Boles 1994; Schodde and Mason 1999; Dickinson 2003) have combined all forms as *P. simplex* (Grey Whistler). The Australian representatives of each group (i.e. *simplex* of the *simplex* group; *peninsulae* of the *griseiceps* group) differ mainly in the amount of yellow pigment in the plumage – a variation seen throughout the extralimital populations and judged by Schodde and Mason (1999) to be a labile character and not specifically significant.

Relationships within the *P. pectoralis* (Golden Whistler) complex are problematic and remain among the most challenging to resolve. Even with the removal of populations now treated as *P. melanura* (Mangrove Golden Whistler), this species as circumscribed by Galbraith (1956) and Mayr (1967) has about 60 named subspecies extending through the south-west Pacific, with each island group having multiple forms. Although these fall into rather ill-defined assemblages, the problem is complicated by varying degrees of gene flow among these subgroups and with some populations of *P. melanura*.

Although Schodde and Mason (1999) began to re-circumscribe the '*pectoralis* group', which includes the Australian taxa, they did not attempt a complete revision, acknowledging the complexity of the problem. These authors suggested that the Australian forms, together with those in New Britain and montane West New Guinea, are a different species from those in the Solomon Islands and those in Fiji, but had difficulty placing birds of the eastern New Guinean archipelago. Dickinson (2003) used this arrangement as a baseline for dividing *pectoralis* of Galbraith (1956) and Mayr (1967) into nine species. These studies provide important bases towards resolving the phylogeography of the *pectoralis* complex. Arrangements based primarily on plumage are unlikely to provide a satisfactory answer, so here the conventional treatment is followed, while conceding its unsatisfactory nature.

Species limits in the *P. rufiventris* (Rufous Whistler) complex also vary among authors, particularly in relation to the non-Australian populations. For example, *leucogastra* (lowland south-east New Guinea) was maintained in *rufiventris* by Beehler and Finch (1985), placed in *P. monacha* (White-bellied Whistler) by Dickinson (2003) and recognised as a distinct species by Sibley and Monroe (1990) and Schodde and Mason (1999). None of these treatments affects the nomenclature of Australian birds.

Falcunculus frontatus	Crested Shrike-tit
Pachycephala olivacea	Olive Whistler
Pachycephala rufogularis	Red-lored Whistler
Pachycephala inornata	Gilbert's Whistler
Pachycephala pectoralis	Golden Whistler
Pachycephala melanura	Mangrove Golden Whistler
Pachycephala simplex	Grey Whistler
Pachycephala rufiventris	Rufous Whistler
Pachycephala lanioides	White-breasted Whistler
Colluricincla megarhyncha	Little Shrike-thrush
Colluricincla boweri	Bower's Shrike-thrush
Colluricincla woodwardi	Sandstone Shrike-thrush
Colluricincla harmonica	Grey Shrike-thrush
Oreoica gutturalis	Crested Bellbird

Family Oriolidae

Schodde and Mason (1999) reversed the sequence of genera from that in Christidis and Boles (1994), by placing *Sphecotheres* (figbirds) before *Oriolus* (orioles), arguing that previous classifications implied that the group is Asian in origin. An Early Miocene fossil assigned to this family (Boles 1999b) supports an Australo-Papuan origin. Although no phylogenetic analysis was performed, the fossil more closely resembled *Sphecotheres* morphologically. As *Oriolus* and *Sphecotheres* are sister genera, their sequence in a linear list does not matter. No change is made from Christidis and Boles (1994).

Christidis and Boles (1994) followed Ford (1975) and Schodde (1975) in recognising only one species of *Sphecotheres*, although they stated that the status of the extralimital forms *viridis* (Timor) and *hypoleucus* (Wetar Island) was not resolved. Bruce (in White and Bruce 1986) considered that *hypoleucus* was a distinct species from *viridis*. Sibley and Monroe (1990) also separated *hypoleucus*, but maintained all other forms in *viridis*. Schodde and Mason (1999) recognised the *vieilloti–flaviventris* group (Australia, New Guinea, Kei Islands) as a species separate from *viridis–hypoleucus*. Coates and Bishop (1997) and Dickinson (2003) also took this action and also treated both *viridis* and *hypoleucus* as species. The Australian forms *vieilloti* and *flaviventris* intergrade broadly where they meet, and are recognised as a single species (Ford 1975, 1987; Christidis and Boles 1994; Schodde and Mason 1999). Following the developing practice concerning extralimital taxa, three species of *Sphecotheres* are recognised here: *S. viridis*, *S. hypoleucus* and *S. vieilloti*. The name Australasian Figbird was proposed for *S. vieilloti* by Schodde and Mason (1999) and used by Dickinson (2003).

Sphecotheres vieilloti	Australasian Figbird
Oriolus flavocinctus	Yellow Oriole
Oriolus sagittatus	Olive-backed Oriole

Family Artamidae

Christidis and Boles (1994) began the generic sequence with *Artamus*, mainly because the family name is based on the genus, while Schodde and Mason (1999) followed Sibley and Monroe (1990) in placing it last. As Artamini and Cracticini are sister taxa, the sequences are equivalent and there is no systematic reason to favour one over the other. Although Schodde and Mason (1999) suggested that *Artamus* is the more derived genus, this claim is not based on any phylogenetic analysis.

Joseph *et al.* (2006) found that mitochondrial DNA of *Artamus superciliosus* (White-browed Woodswallow) and *A. personatus* (Masked Woodswallow) were monophyletic with respect to other species of *Artamus*, but polyphyletic with respect to each other. These authors suggested that incomplete sorting of ancestral mitochondrial DNA in these apparently recent and rapidly diverging birds adequately explained this result. In light of their distinctive plumages, and evidence for only rare hybridisation and introgression, both *superciliosus* and *personatus* should be regarded as separate species (Joseph *et al.* 2006).

Although no new phylogenetic studies have been undertaken on the Artamidae that would alter the generic and species composition followed in Christidis and Boles (1994), some areas require re-evaluation. Johnstone (2001) and Johnstone and Storr (2004) included *Gymnorhina* in *Cracticus* – probably a valid action and one previously argued by Storr (1952) and used in Storr (1977, 1984). The reasons given by Schodde and Mason (1999) for maintaining the two as separate are not compelling: most relate to adaptations for terrestrial foraging in *Gymnorhina*. Increased terrestriality is not in itself reason for generic separation (note the situation relative to Ground Cuckoo-shrike and *Coracina* versus *Pteropodocys*; cf. Schodde and Mason 1999). *Gymnorhina* is here placed in *Cracticus* following Storr (1952), Johnstone (2001) and Johnstone and Storr (2004) – the Australian Magpie thus becomes *Cracticus tibicen*.

Schodde and Mason (1999) split the Kimberley and Arnhem Land populations of *Cracticus torquatus* (Grey Butcherbird) as a separate species: *C. argenteus* (Silver-backed Butcherbird). They regarded two characters shared by *C. torquatus* and *C. argenteus* as either ancestral or inconsistent and scored traits of *C. argenteus* and *C. mentalis* (Black-backed Butcherbird) as homologous and derived. It is difficult to assess these conclusions in the absence of an independent character analysis. Schodde and Mason (1999) further suggested that *C. argenteus* is intermediate between *C. mentalis* and *C. torquatus*, and that all three should be kept as three species until there is a better resolution of their relationships. While a better understanding is highly desirable, the more conservative approach is taken here: *C. argenteus* is retained in *C. torquatus* pending appropriate studies.

Artamus leucorynchus	White-breasted Woodswallow
Artamus personatus	Masked Woodswallow
Artamus superciliosus	White-browed Woodswallow
Artamus cinereus	Black-faced Woodswallow
Artamus cyanopterus	Dusky Woodswallow
Artamus minor	Little Woodswallow
Cracticus quoyi	Black Butcherbird
Cracticus torquatus	Grey Butcherbird
Cracticus mentalis	Black-backed Butcherbird
Cracticus nigrogularis	Pied Butcherbird
Cracticus tibicen	Australian Magpie
Strepera graculina	Pied Currawong
Strepera fuliginosa	Black Currawong
Strepera versicolor	Grey Currawong

Family Dicruridae

Schodde and Mason (1999) advocated a much narrower circumscription of *Dicrurus bracteatus* (Spangled Drongo) than that of Bruce (in White and Bruce 1986), which was followed by Christidis and Boles (1994), and that of Sibley and Monroe (1990). They suggested that *D. bracteatus* should refer only to the populations in Australia, New Guinea, North Moluccas and New Britain, thereby excluding populations from the Philippines and Solomon Islands (Guadalcanal, San Cristobel). While this treatment makes biogeographical sense, (particularly the exclusion of the Philippines populations) and is followed here, Schodde and Mason (1999) did not follow up on their revision regarding the implications for the Philippines and Solomons populations. Dickinson (2003) followed the species delimitation of Schodde and Mason (1999), except for keeping the Solomons birds in *bracteatus* and the Philippines ones in *D. hottentottus*.

Pasquet *et al.* (2007) investigated relationships among the drongos using DNA sequences from two nuclear and two mitochondrial genes. Their study was based on representatives of 18 of the 20 species recognised by Dickinson (2003), including *bracteatus* from New Guinea and *hottentottus* from Cambodia and Thailand. These two taxa formed part of a small subclade together with two other species, but were not themselves sister taxa. Instead, *bracteatus* formed a sister pair with *D. megarhynchus* (Ribbon-tailed Drongo; New Ireland), while *hottentottus* was closest to *D. balicassius* (Balicassio; Philippines).

Schodde and Mason (1999) pointed out that the name *bracteatus* was published by Gould (1843) in combination with *Dicrurus* (not 1842, *contra* Christidis and Boles 1994), and thus his name should not be bracketed after the scientific name.

Dicrurus bracteatus	Spangled Drongo

Family Rhipiduridae

The recognition of the Rhipiduridae as a family distinct from the monarch flycatchers and drongos (*contra* Christidis and Boles 1994 and Schodde and Mason 1999) is discussed under the introduction to the Passeriformes (above).

Schodde and Mason (1999) split *Rhipidura rufifrons* (*sensu lato*) into three species complexes:

(1) *rufifrons* (eastern and northern Australia, southern New Guinea, Louisiade Archipelago, Solomon Islands, Santa Cruz, Micronesia, northern Moluccas)
(2) *dryas* (Lesser Sundas, northern Australia, southern New Guinea)
(3) *teysmanni* (south-western Moluccas, Sulawesi, Palau).

They argued that treatments such as those of Mayr and Monynihan (1946), Watson and Mayr (1986) and White and Bruce (1986) were unbalanced in that they treated *teysmanni* and several of its members as separate species, but combine the *rufifrons* and *dryas* groups as one. They further suggested that the *dryas* group itself might comprise three species (*dryas*, western Lesser Sundas, Australia, south-western New Guinea; *elegantula*, eastern Lesser Sundas; and *squamata*, south-eastern Moluccas, western Papuan and Kai Islands).

While the treatments of Mayr and Monynihan (1946), Watson and Mayr (1986) and White and Bruce (1986) may be unbalanced, it does not follow that further splitting is desirable without substantiation. Other than for slight overlap in the eastern Moluccas, the *rufifrons* and *dryas* clusters occupy discrete ranges. As regarded by Mayr and Monynihan (1946), each forms a monotypic lineage within the larger *rufifrons* complex. Thus, they each can be considered at species level without any group being paraphyletic. Here, specific recognition of *rufifrons* and *dryas* (including *elegantula* and *squamata*) is followed – an arrangement also accepted by Boles (2006). The English name for *rufifrons* continues to be Rufous Fantail. For *dryas*, Arafura Fantail seems preferable to Wood Fantail used by Johnstone (1990, 2001) and Johnstone and Storr (2004).

The current convention is to separate *Rhipidura phasiana* of northern Australia and New Guinea as a separate species to *R. fuliginosa*, which occurs in the rest of Australia, New Zealand and Melanesia (Ford 1981c; Sibley and Monroe 1990; Christidis and Boles 1994; Schodde and Mason 1999; Johnstone 2001; Dickinson 2003). Schodde and Mason (1999) went further by separating the Australian, Norfolk Island and Melanesian forms as one species, *R. albiscapa*, and those in New Zealand and Lord Howe Island as another species, *R. fuliginosa* – based on marked differences in vocalisations. It is likely that the *R. fuliginosa–albiscapa* group comprises more than one species given that *R. phasiana* is here regarded as a separate species. Whether the split as circumscribed by Schodde and Mason (1999), and followed by Boles (2006), is the most accurate reflection of this, however, is debatable. Different patterns of relationships between Australian, New Zealand, Melanesian, Norfolk Island and Lord Howe Island populations are evident or have been proposed for *Ninox novaeseelandiae–boobook*, *Zosterops lateralis–strenuus–tenuirostris*, *Gerygone igata–insularis-modesta–flavolateralis* and *Petroica* *multicolor–boodang–macrocephala*, among others. The treatment of Schodde and Mason (1999) is tentatively followed here, while flagging the need for more detailed examination of their relationships. Schodde and Mason (1999) used Grey Fantail and New Zealand Fantail for *albiscapa* and *fuliginosa*, respectively.

The white-tailed form (*albicauda*) of *R. albiscapa* found in the inland of western Australia is quite distinctive. The possibility that it could be recognised at specific level should be investigated.

Rhipidura rufifrons	Rufous Fantail
Rhipidura dryas	Arafura Fantail
Rhipidura fuliginosa	New Zealand Fantail$^{LH/E}$
Rhipidura albiscapa	Grey Fantail
Rhipidura phasiana	Mangrove Grey Fantail
Rhipidura rufiventris	Northern Fantail
Rhipidura leucophrys	Willie Wagtail

Family Laniidae

Lanius cristatus (Brown Shrike) was included on the supplementary list in Christidis and Boles (1994), based on an unsubstantiated report from Christmas Island in 1962 (Pearson 1966). Several reports from Christmas Island have now been accepted (Lansley *et al.* 2003; BARC 260, 299, 329), so this species is transferred to the main Australian list.

A road-killed individual of *Lanius tigrinus* (Tiger Shrike) was found near Fremantle, Western Australia. Given its location, this bird may have been ship-assisted. No details of this specimen have been published.

Lanius cristatus	Brown Shrike$^{C/V}$
Lanius tigrinus	Tiger Shrike^{V}

Family Corvidae

No taxonomic changes have been proposed in the literature following publication of Christidis and Boles (1994). Whether the two forms of *Corvus tasmanicus* (Forest Raven) – *tasmanicus* (Tasmania, coast of south-eastern mainland) and *boreus* (New England Tableland) – should be treated as two species, as advocated by McAllan and Bruce (1988), is still unresolved.

Schodde and Mason (1999) recommended that *C. splendens* (House Crow) should be treated as a self-introduced vagrant, even while conceding that the birds are ship-assisted. An individual *Pica pica* (Black-billed Magpie) that appeared at Hay Point, near Mackay, Queensland, in early 2001, also obviously arrived on a ship. Another bird was reported from the Hunter Valley, New South Wales, but details were not published. As explained in the introduction to this work, these species are placed on the main, rather than supplementary, list.

Pica pica	Black-billed Magpie^{V}
Corvus coronoides	Australian Raven
Corvus tasmanicus	Forest Raven
Corvus mellori	Little Raven
Corvus bennetti	Little Crow
Corvus orru	Torresian Crow
Corvus splendens	House Crow^{V}

Family Monarchidae

The sequence of genera is altered to reflect the findings of Filardi and Smith (2005). These authors did not report on *Grallina* (magpie-larks), so this genus is placed after the pied monarchs. In recognition of the peculiarities of *Machaerirhynchus* (boatbills) (cf. Schodde and Mason 1999) and the absence of obvious close relatives, this genus is placed at the end of the linear sequence. Should it be shown to deserve separation at subfamilial (Schodde and Mason 1999) or familial level (Dickinson 2003), this would cause no disruption to the sequence of remaining monarchine taxa.

Generic compositions of *Arses*, *Monarcha* and *Myiagra* require examination (Christidis and Boles 1994), and there is a particular need to consider non-Australian taxa before reaching any conclusions. The only attempt has been the investigation of relationships within *Monarcha* by Filardi and Smith (2005). They used 16 of the 26 species recognised by Watson *et al*. (1986b), which were mainly from Australia and the Solomon Islands. Using mitochondrial gene sequences, they recovered two main clades, which they designated the 'chestnut-bellied' and the 'pied' monarchs. These terms are not advisable because the colour patterns are not restricted to the respective groups. For example, some 'chestnut-bellied' monarchs lack this colouration while there are 'pied' monarchs that have it. In addition, such 'pied' monarchs are not pied, and they do not include the Pied Monarch (*Arses kaupi*). The 'chestnut-bellied' and the 'pied' monarchs (*sensu* Filardi and Smith) are here cited as Group 1 and Group 2, respectively, for the purposes of the following discussion.

Group 1 includes *leucotis* (White-eared Monarch), *chrysomela* (Golden Monarch, New Guinea) and *melanopsis* group (*melanopsis*, Black-faced Monarch; *frater*, Black-winged Monarch; *cinerascens*, Island Monarch; and the Solomons' species *castaneiventris* and *richardsii*). The single representative of the monarchine genus *Clytorhynchus* (*C. hamlini*, Rennell Shrike-bill, Rennell Island) is also part of this clade. Group 2 includes pied species from the Solomon Islands (*barbatus*, *browni*), New Guinea (*guttula*, *manadensis*) and Bismarck Archipelago (*infelix*, *verticalis*), plus the unusual *M. axillaris* (Fantail Monarch, New Guinea) and Australian *trivirgatus* (Spectacled Monarch).

These two assemblages were found to be as different from each other as they are from *Arses* and *Myiagra*. Generic status for each is warranted. Group 1 retains the name *Monarcha* Vigors and Horsfield, 1827 (type species *melanopsis* Vieillot, 1818). The available name for Group 2 is *Symposiachrus* Bonaparte, 1854 (type species *trivirgatus* Temminck, 1826).

Filardi and Moyle (2005) published the phylogeny with a different mixture of taxa, including some that were not presented in Filardi and Smith (2005). Their study employed DNA sequences from the mitochondrial ND2 gene and, for some species, the nuclear myoglobin intron 2. They obtained more detailed subdivisions of Group 1, and identified three subclades. The first consists of the *melanopsis* group plus *Metabolus rugensis* (Truk Monarch; Truk, Micronesia). This is the sister group to a second assemblage of Pacific island taxa with representatives of *Pomarea* (eastern Polynesia), *Neolalage* (Vanuatu), *Mayrornis* (Fiji, Vanikoro), *Clytorhynchus* (New Caledonia, Solomons through Samoa) and *Chasiempis* (Hawaii). In turn, a third, smaller clade, comprising *Monarcha leucotis* and *M. chrysomela*, is the sister clade to these. The taxonomic treatment of the island clade was not addressed by the authors and is outside the scope of the present work. Whether or not some of these should be combined generically within that group does not affect the treatment of Australia taxa. What is of relevance is whether or not these are all placed in a considerably expanded *Monarcha*. If they are, then *leucotis* and *chrysomela* can be included and there is no need to change the generic name for these two species. If, however, the Pacific island taxa are retained as distinct from *Monarcha*, then *leucotis* and *chrysomela* must also be separated generically to avoid paraphyly. The available name is *Carterornis* Mathews, 1912, of which *leucotis* is the type species.

In Filardi and Moyle's phylogeny, it appeared that *trivirgatus* is not monophyletic. The study sampled migratory southern birds and resident northern (Cape York) birds, and these came out in different sections of the Group 2 clade. If these were to be treated as separate species, the southern breeding birds would take the name *gouldii* G.R. Gray, 1860, if no other populations are conspecific with it. Unfortunately, the populations through New Guinea and Moluccas, including the nominate form, were not sampled, so it is uncertain how many species there are in this complex or which populations belong together. This is particularly important for Cape York populations (*albiventris* Gould, 1866) in relation to those farther to the north and west, several of which have older names. Until further information is obtained, all forms are maintained in a single species, while acknowledging that this may not be the most desirable choice.

Schodde and Mason (1999) separated *Arses lorealis* (northern Cape York Peninsula) from *A. telescopthalmus* (Frilled Monarch; Torres Strait Islands and New Guinea) as distinct species. Their main reason was the need to balance the taxonomy of allopatric forms resulting from the separation by Sibley and Monroe (1990) of *A. insularis* (New Guinea) from *A. telescopthalmus*. These are retained as a single species here.

Schodde and Mason (1999) pointed out that the spelling *telescopthalmus* is original, rather than *telescophthalmus*, and the authors should be Lesson and Garnot, 1827, not Garnot, 1827.

Whether *Myiagra nana* (Paperbark Flycatcher) should be regarded as a distinct species from *M. inquieta* (Restless Flycatcher) remains unresolved. Christidis and Boles (1994) maintained them as one species. There are consistent differences in morphology and size and no evidence of intergradation where the distributions approach in northern Queensland (Schodde and Mason 1999). This intriguing question warrants more scrutiny before being accepted. An immature *Monarcha cinerascens* was photographed on Ashmore Reef (Dooley 2005a) and subsequently accepted by BARC (BARC 467).

Myiagra ruficollis	Broad-billed Flycatcher
Myiagra rubecula	Leaden Flycatcher
Myiagra cyanoleuca	Satin Flycatcher
Myiagra alecto	Shining Flycatcher
Myiagra inquieta	Restless Flycatcher
Carterornis leucotis	White-eared Monarch
Monarcha melanopsis	Black-faced Monarch
Monarcha frater	Black-winged Monarch
Monarcha cinerascens	Island Monarch$^{A/V}$
Symposiarchus trivirgatus	Spectacled Monarch
Grallina cyanoleuca	Magpie-lark
Arses telescopthalmus	Frilled Monarch
Arses lorealis	Frill-necked Monarch
Arses kaupi	Pied Monarch
Machaerirhynchus flaviventer	Yellow-breasted Boatbill

Family Corcoracidae

The two monotypic genera *Corcorax* (*C. melanorhamphos*; White-winged Chough) and *Struthidea* (*S. cinerea*; Apostlebird) have been consistently identified as a monotypic assemblage by all available molecular data (Sibley and Ahlquist 1985; Baverstock *et al.* 1992; Barker *et al.* 2004). No changes are made from Christidis and Boles (1994) in the arrangement of this family.

Corcorax melanorhamphos	White-winged Chough
Struthidea cinerea	Apostlebird

Family Paradisaeidae

This family, which has many representatives in New Guinea and the eastern Moluccas (about 35 species), is represented in Australia by only two genera and four species. Nunn and Cracraft (1996) used mitochondrial DNA sequences to produce a phylogeny of the major subdivisions of the birds-of-paradise. Frith and Beehler (1998) conducted a cladistic analysis on over 50 morphological, breeding and behavioural characters. Both found *Manucodia* (manucodes) to occupy a more basal position in the family than *Ptiloris* (riflebirds).

Schodde and Mason (1999) separated *Manucodia keraudrenii* (Trumpet Manucode) into *Phonygammus*, citing plumage traits and genetic distances as evidence. The latter are based on the DNA sequence study of Nunn and Cracraft (1996), who only examined two species of manucode: *keraudrenii* and *comrii*. The level recorded between the two is consistent with other generic separations in the family. Although it might be premature until similar data are obtained for other *Manucodia*, this generic separation is accepted here.

Beehler and Swaby (1991) and Cracraft (1992) subdivided the conventional *Ptiloris magnificus* (Magnificent Riflebird) into two and three species, respectively. These actions were not scrutinised in Nunn and Cracraft's (1996) molecular study. Pending such investigations, three species of *Ptiloris* are recognised here – one shared with New Guinea (see also Schodde and Mason 1999).

Phonygammus keraudrenii	Trumpet Manucode
Ptiloris paradiseus	Paradise Riflebird
Ptiloris victoriae	Victoria's Riflebird
Ptiloris magnificus	Magnificent Riflebird

Family Petroicidae

Schodde and Mason (1999) reviewed the Australasian robins across all genera, using characters such as osteology that had not previously been employed in the study of this group. Although these were not analysed in a phylogenetic manner, because this is the first major study of the entire family, the major subdivisions identified, and their sequence, are accepted here. Three lineages were recovered: Eopsaltriinae (*Heteromyias*, *Poecilodryas*, *Peneothello*, *Peneoanthe*, *Tregellasia*, *Eopsaltria* and *Melanodryas*); Petroicinae (*Monachella*, *Microeca*, *Eugerygone*, *Petroica* and *Pachycephalopsis*); and Drymodinae (*Drymodes*). The characters are less useful for determining generic limits.

Keast (1957), followed by Mayr (1986b), placed *cucullata* (Hooded Robin) and *vittata* (Dusky Robin) in *Petroica*. Schodde (1975), Schodde and McKean (1976) and Schodde and Mason (1999) presented reasons why these species were better segregated in *Melanodryas*. This recommendation was followed by most subsequent authors (e.g. Boles 1988; Sibley and Monroe 1990; Christidis and Boles 1994; Higgins and Peter 2002; Dickinson 2003; cf. Johnstone 2001; Johnstone and Storr 2004).

Ford (1979) recommended that *Eopsaltria australis* (Eastern Yellow Robin) and *E. griseogularis* (Western Yellow Robin) should be considered conspecific owing to similarities in vocalisations, ecology and behaviour. These were maintained as separate by Christidis and Boles (1994) and most subsequent authors (cf. Johnstone and Storr 2004). This question has yet to receive rigorous investigation.

Christidis and Boles (1994) followed Schodde (1975) in treating *Peneonanthe pulverulenta* (Mangrove Robin) as part of *Eopsaltria*. Schodde and Mason (1999) separated this species again into the monotypic *Peneonanthe* – an action that is followed here. A detailed argument was also presented by Noske (1978) to support the retention of *Peneonanthe*.

Schodde and Mason (1999) combined *Heteromyias* with *Poecilodryas* under the latter name. *Poecilodryas*, as usually circumscribed (e.g. Mayr 1986; Dickinson 2003), is rather heterogeneous, and some of its species exhibit greater resemblances to species of *Heteromyias* than they show among themselves. It is likely that some species in *Poecilodryas* require reallocation to other genera, in which case this argument will need revisiting. Here the convention of recognising both genera (Mayr 1986c, Sibley and Monroe 1990, Christidis and Boles 1994) is retained until further analyses are carried out.

Schodde and Mason (1999) continued to treat the forms *cinereifrons* (Grey-headed Robin; Australian Wet Tropics) and *albispecularis* (Ashy Robin; New Guinea) as one species, as did Christidis and Boles (1994). These birds have congruent distributions with members of *Orthonyx* (logrunners). Given the recent revision of Australian and New Guinean *Orthonyx*, which showed that external similarities were not good indications of conspecificity, it seems prudent to retain two species.

While Christidis and Boles (1994) followed Schodde (1975) in treating *Poecilodryas cerviniventris* (Buff-sided Robin; Top End, Kimberley) and *P. superciliosa* (White-browed Robin; north-eastern Queensland) as a single species, they commented that the issue warrants detailed investigation. Schodde and Mason (1999) separated the two, noting that the pronounced differences in size and plumage are as great as or exceed the differences between *P. superciliosa* and *P. hypoleuca* (Black-sided Robin, New Guinea). Both *P. cerviniventris* and *P. superciliosa* are recognised here.

Microeca tormenti (Brown-tailed or Kimberley Flycatcher) is now regarded as part of *M. flavigaster* (Lemon-breasted Flycatcher) (Sibley and Monroe 1990, Christidis and Boles 1994, Schodde and Mason 1999) because of reported hybridisation where these populations meet around the head of Cambridge Gulf, near the coastal border of Western Australia and Northern Territory (Johnstone 1984).

The distribution map shown Schodde and Mason (1999) indicates that the zone of hybridisation abuts the distribution of *M. flavigaster flavigaster,* but is separated from that of *M. f. tormenti* by about 160 kilometres. In fact, birds through most of the Cambridge Gulf area exhibit evidence of hybridisation. Furthermore, in this region, *flavigaster* occurs in both tropical woodland and mangrove, thus facilitating contact with the mangrove-restricted *tormenti*. Further investigation is needed to better understand the status of *tormenti*.

Schodde (1981) suggested that the eastern and western forms of *Microeca fascinans* (Jacky Winter) – (*fascinans* and *assimilis*, respectively) – could represent separate species. The northern form *pallida* would presumably be allied with eastern *fascinans*. Schodde and Mason (1999) stated that they would have adopted this split were it not for intergradation where the forms meet in the Yorke Peninsula, Mt Lofty Range and Murray mallee. A single species is accepted here, although more work is needed.

Schodde and Mason (1999) split the *Petroica multicolor* complex into two species: *P. boodang* (Scarlet Robin) in Australia and *P. multicolor* (Pacific Robin) in Norfolk Island, Melanesia and Polynesia. The two groups certainly are readily recognisable and probably can be treated as separate species – the latter group may merit further subdivision. Both species occur within the Australian region, *boodang* in mainland Australia and Tasmania, and *multicolor* in Norfolk Island.

Microeca fascinans	Jacky Winter
Microeca flavigaster	Lemon-bellied Flycatcher
Microeca griseoceps	Yellow-legged Flycatcher
Petroica multicolor	Pacific Robin
Petroica boodang	Scarlet Robin
Petroica goodenovii	Red-capped Robin
Petroica phoenicea	Flame Robin
Petroica rosea	Rose Robin
Petroica rodinogaster	Pink Robin
Melanodryas cucullata	Hooded Robin
Melanodryas vittata	Dusky Robin
Tregellasia capito	Pale-yellow Robin
Tregellasia leucops	White-faced Robin
Eopsaltria australis	Eastern Yellow Robin
Eopsaltria griseogularis	Western Yellow Robin
Eopsaltria georgiana	White-breasted Robin
Peneonanthe pulverulenta	Mangrove Robin
Heteromyias albispecularis	Grey-headed Robin
Poecilodryas superciliosa	White-browed Robin
Poecilodryas cerviniventris	Buff-sided Robin
Drymodes superciliaris	Northern Scrub-robin
Drymodes brunneopygia	Southern Scrub-robin

Family Alaudidae

Christidis and Boles (1994) followed McKean in Schodde (1975) regarding the species limits of *Mirafra javanica*, although its extralimital relationships were not addressed (Schodde and Mason 1999). Here, following Sibley and Monroe (1990), Schodde and Mason (1999) and Dickinson (2003), *M. javanica* is restricted to the Asian–Australian forms of the complex. These and other authors (e.g. Johnstone and Storr 2004) used the English name Horsfield's Bushlark for this species as delimited here, and this is accepted. Because the distribution extends through south-east Asia and the Philippines, the name Australian Bushlark is inappropriate.

Christidis and Boles (1994) did not address the taxonomic status of the introduced *Alauda arvensis*. Schodde and Mason (1999) identified it as the nominate form *A. arvensis arvensis*. As some authors separate eastern Asian forms as a distinct species, it is best to qualify the English name: Eurasian Skylark is used (e.g. Sibley and Monroe 1990; Schodde and Mason 1999; Dickinson 2003).

Mirafra javanica	Horsfield's Bushlark
Alauda arvensis	Eurasian Skylark^{I}

Family Cisticolidae

As circumscribed, this family has two Australian species: *Cisticola exilis* (Golden-headed Cisticola) and *C. juncidis* (Zitting Cisticola).

Cisticola juncidis	Zitting Cisticola
Cisticola exilis	Golden-headed Cisticola

Family Acrocephalidae

Christidis and Boles (1994) followed Schodde (1975) in treating *Acrocephalus australis* as a subspecies of *A. stentoreus*, but noted that the two probably were separate species. Mitochondrial DNA sequence studies of Leisler *et al.*(1997) and Helbig and Seibold (1999) provided compelling evidence for treating *A. australis* as a separate species. Similarly, these two studies also confirm the treatment of *A. orientalis* as a species separate from *A. arundinaceus*, as adopted by Christidis and Boles (1994). According to these studies, *A. orientalis* and *A. stentoreus* are sister species, while *A. australis* is closely related to *A. vaughani*. *Acrocephalus arundinaceus* was basal to this complex.

Both Leisler *et al.*(1997) and Helbig and Seibold (1999) found *Hippolais* to be paraphyletic with respect to *Acrocephalus*; *H. pallida* and *H. caligata* associated more closely with *Acrocephalus*. Leisler *et al.* (1997) suggested that there were four groups that could be recognised as genera: *Notiocichla*, *Calamodus*, *Iduna* and *Acrocephalus*. The last divided further into *Acrocephalus* and *Calamocichla* (see also Helbig and Seibold 1999). The Australian forms *A. australis* and *A. orientalis* fall in the nominate group of the *Acrocephalus* complex.

Acrocephalus australis	Australian Reed-Warbler
Acrocephalus orientalis	Oriental Reed-Warbler^{V}

Family Megaluridae

The Megaluridae are here removed from the Sylviidae (see introduction to Passeriformes, above). The sequence of genera and species follows Christidis and Boles (1994) as this is consistent with the DNA studies of Alström *et al.* (2005).

Schodde and Mason (1999) split *Megalurus timoriensis* into two species – *M. timoriensis* (Australia, southern Fly River region of New Guinea, Timor, Ambon, Sumba, Celebes) and *M. macrurus* (remainder of New Guinea, Bismark Archipelago) – while commenting that the forms in the Philippines could be related to the latter group or, more likely, represent a third species. Although this proposed revision is worth investigating, it is not adopted here as there are no compelling data at this stage. The claim that the forms *M. macrurus* and *M. timoriensis* abut in south central New Guinea without intergrading is misleading given the limited number of specimens and records in collections from southern New Guinea. According to the distribution maps in Coates (1990), the Fly River population does not abut the more northern form.

Records of *Locustella ochotensis* (Middendorff's Warbler) from Ashmore Reef, including photographs, had not been considered by BARC at the time of this writing (Dooley 2006a, 2007a); it is retained on the supplementary list until such time.

Locustella ochotensis	Middendorff's Warbler$^{S(A)}$
Megalurus timoriensis	Tawny Grassbird

Megalurus gramineus	Little Grassbird
Cincloramphus mathewsi	Rufous Songlark
Cincloramphus cruralis	Brown Songlark
Eremiornis carteri	Spinifexbird

Family Timaliidae

The Zosteropidae are here merged with the Timaliidae (true babblers) for reasons explained in the introduction to the Passeriformes (above).

Schodde and Mason (1999) made two changes to the treatment in Christidis and Boles (1994). They reversed the positions of *Zosterops tenuirostris* (Slender-billed White-eye) and *Z. albogularis* (White-chested White-eye), arguing that the latter is much closer to *Z. lateralis* in morphology. In the absence of a detailed phylogenetic revision to substantiate this claim, the conventional sequence of Mees (1957, 1969b), as followed by Sibley and Monroe (1990) and Christidis and Boles (1994), is maintained here. The second, and more profound, change in Schodde and Mason (1999) is the merger of *Z. strenuus* (Lord Howe Island) with *Z. tenuirostris* (Norfolk Island). Mees (1969b) proposed that the two forms arose from independent colonisations of these islands and similarities in the form were convergent. Schodde and Mason (1999) considered that both forms arose from a single invasion of one island, which then crossed to the other. McAllan *et al.* (2004) noted that these forms differed in bill structure, nest construction and described feeding habits. The two species are maintained here.

Birds of the population in the Capricorn Island group, southern Great Barrier Reef (*Z. lateralis chlorocephala*), differ in size and proportions and some life history aspects from birds from the mainland or other islands and appear to be largely genetically isolated from them. For these reasons, Kikkawa (2003) proposed that the Capricorn form should be recognised at specific level. Analyses using mitochondrial DNA sequences and microsatellites showed that *chlorocephala* is embedded within a larger cluster of Australasian populations of *Z. lateralis* (Degnan *et al.* 1999). Accordingly, *chlorocephala* is retained as part of that species

The correct spelling of the specific epithet of the Pale White-eye is *citrinella,* because it is neither Latin nor latinised – in this instance, it is an Italian word – and thus is invariable, regardless of the gender of the generic name (David and Gosselin 2002a).

It is currently uncertain whether *Z. albogularis* has become extinct in recent years.

Zosterops natalis	Christmas Island White-eye$^{C,CK/I}$
Zosterops citrinella	Pale White-eye
Zosterops luteus	Yellow White-eye
Zosterops lateralis	Silvereye
Zosterops strenuus	Robust White-eye$^{LH/E}$
Zosterops tenuirostris	Slender-billed White-eye^{N}
Zosterops albogularis	White-chested White-eye$^{N/E?}$

Family Phylloscopidae

Apart from the removal of the Phylloscopidae from the Sylviidae (see introduction to Passeriformes), no changes are made to Christidis and Boles (1994). *Phylloscopus borealis* (Arctic Warbler) has been recorded as a vagrant from several mainland and island localities, with reports accepted by BARC (Hassell 1998; BARC 240, 243, 430, 438).

Phylloscopus borealis	Arctic Warbler$^{V,\ A/V}$

Family Hirundinidae

Several recent classifications (e.g. Turner and Rose 1989; Sibley and Monroe 1990) have treated *Hirundo* (barn swallows) as encompassing the nominal genera *Petrochelidon* (cliff swallows), *Cecropsis* (red-rumped swallows) and *Ptyonoprogne* (crag martins), but excluding *Delichon* (house martins). Dickinson (2003), however, maintained all as separate genera. Christidis and Boles (1994) accepted only *Hirundo* for the Australian species.

Sheldon and Winkler (1993) used DNA–DNA hybridisation analyses to examine relationships within the swallows. Included in their study were single representatives of *Hirundo*, *Cecropsis*, *Ptyonoprogne* and *Delichon* and two of *Petrochelidon*. All five genera/subgenera were found to comprise a monophyletic assemblage relative to other genera examined. Furthermore, those authors found that *Delichon* was embedded within *Hirundo* (*sensu lato*) (thus, if *Petrochelidon* and *Cecropis* are merged in *Hirundo*, as is often done, then so too must *Delichon*). Two main groups were identified: one comprising *Hirundo* and *Ptyonoprogne* and another consisting of the pair of *Petrochelidon–Cecropis*, which were a sister pair to *Delichon*. On the basis of those findings, Schodde and Mason (1999) treated each of these taxa as separate genera, arguing that the DNA–DNA hybridisation distances between the lineages were of the same order as those between other swallow genera. A more recent study examining the same taxa as Sheldon and Winkler (1993), but, based on sequencing of the mitochondrial cytochrome-*b* gene, Sheldon *et al.* (1999) confirmed many of the findings of the former study. The cytochrome-*b* distances were very compressed (between 10 and 13%) and not suitable for determining taxonomic structure. Nevertheless, the data confirmed a sister relationship between *Hirundo* and *Ptyonoprogne* and, in turn, between these and the *Petrochelidon–Delichon–Cecropsis* assemblage.

Sheldon *et al.* (2005) sequenced segments of two mitochondrial and one nuclear gene, and – using an extensive taxonomic coverage – recovered the two conventional clades: the river martins (*Pseudochelidon*) and the typical swallows (all other species). In the latter, they found three major subclades: the core martins (including *Riparia*, *Tachycineta* and *Progne*), those constructing mud nests (*Hirundo sensu lato*, including *Petrochelidon*, *Cecropis*, *Delichon* and *Ptyonoprogne*) and the so-called 'basal relicts' (*Cheramoeca*, *Pseudhirundo*, *Psalidoprocne*). The martins appear to form the sister group to the other two subclades. The data confirmed earlier findings that the mudnest building taxa divide into two groups: *Hirundo–Ptyonoprogne* and *Petrochelidon–Cecropis–Delichon*. Sequence distances suggest that all could be recognised at generic level or that *Petrochelidon* and *Cecropis* could be combined and the others treated generically. Here each is treated as a separated genus.

In Australia, the basal relicts are represented by *Cheramoeca leucosterna* (White-backed Swallow). On the basis of DNA–DNA hybridisation and sequence distances in these studies, the two monotypic genera – *Pseudhirundo* Roberts, 1922 (*P. griseopyga*, Grey-rumped Swallow, Africa) and *Cheramoeca* Cabanis, 1850 – could be combined. Note that the specific epithet has been changed from *leucosternus* to *leucosterna* following David and Gosselin (2002b).

Here, the sequence of genera and species is unchanged from Christidis and Boles (1994), with the exception that Schodde and Mason (1999) are followed in having *Petrochelidon ariel* precede *H. nigricans*. Schodde and Mason (1999) argue that the hole-nesting habit of *P. nigricans* is secondarily derived within the group (see also Winkler and Sheldon 1993).

Turbott (1990) and Holdaway *et al.* (2001) regarded *Hirundo neoxena* (Welcome Swallow) and *H. tahitica* (Pacific Swallow) as conspecific; however, Sheldon *et al.* (2005) found that, although they are sister taxa, they were distinct species. *Petrochelidon ariel* (Fairy Martin) and *P. nigricans* (Tree Martin) are also sister taxa.

The current trend is to treat *Cecropis daurica* (Africa, Europe, Asia) and *C. striolata* (south-east Asia) as separate species (White and Bruce 1986; Turner and Rose 1989; Sibley and Monroe 1990; Coates 1997; Schodde and Mason 1999; Dickinson 2003), and this is followed here. There has been debate as to whether *C. striolata* or *C. daurica* is a vagrant to Australia (summarised in Christidis and Boles 1994). Schodde and Mason (1999) mistakenly implied that Christidis and Boles (1994) favoured the former, when, in fact, the opposite was the case. The original RAOU

Records Appraisal Committee decision was to treat accepted occurrences from Australia as belonging to *C. daurica* (Patterson 1991). Schodde and Mason (1999) argued that the only likely visitors to Australia are from the *C. daurica* group, which is supported by the identification of the one known specimen. Since then, field identification criteria for separating *daurica* and *striolata* have been well established (Carter 2000b), and BARC has accepted a number of records of *daurica* from northern Australia and Christmas Island.

Christidis and Boles (1994) followed Schodde (1975) and Carter (1992) in not accepting records of *H. tahitica* from Australia. Schodde and Mason (1999) believed that it probably occurred regularly on northern islands in Torres Strait, but there are as yet no specimens to confirm this. Johnstone and Storr (2004) cited a observation from near Port Hedland, Western Australia, and there are a number of other reports from other northern localities. Thus far, no records have been accepted by BARC. Until such time, *H. tahitica* is not accepted for the main Australian list. It is placed on the supplementary list. There was a report under review by BARC as of this writing.

Reports of *Delichon dasypus* (Asian House Martin) from Christmas Island have been accepted (BARC 313, 348), while those from Cocos (Keeling) Islands remain unconfirmed which is now extirpated and placed on the supplementary list. Pasquet *et al.* (2001) showed that there are two main clades in this family – an African one and an Asian one – with *Pycnonotus* being part of the latter.

Cheramoeca leucosterna	White-backed Swallow
Hirundo rustica	Barn Swallow
Hirundo neoxena	Welcome Swallow
Hirundo tahitica	Pacific Swallow^{S}
Petrochelidon ariel	Fairy Martin
Petrochelidon nigricans	Tree Martin
Cecropis daurica	Red-rumped Swallow$^{V,C/V}$
Delichon dasypus	Asian House Martin$^{C/V}$

Family Pycnonotidae

No changes are made from the two introduced species listed in Christidis and Boles (1994): *Pycnonotus jocosus* (Red-whiskered Bulbul) and *P. cafer* (Red-vented Bulbul),

Pycnonotus jocosus	Red-whiskered Bulbul^{I}
Pycnonotus cafer	Red-vented Bulbul$^{S/E}$

Family Muscicapidae

Four species have been recorded for Australia: all are vagrants and all are new to the list since 1994. These are *Monticola solitarius* (Blue Rock Thrush), south-eastern Queensland (Carter and Shaw 1994; BARC 232); *Oenanthe isabellina* (Isabelline Wheatear), north-eastern Queensland (BARC 359); *Ficedula narcissina* (Narcissus Flycatcher), Barrow Island, Western Australia (Johnstone and Storr 2004; BARC 259); and *Cyanoptila cyanomelana* (Blue-and-White Flycatcher), Western Australia and Christmas Island (Johnstone and Darnell 1996; Hassell *et al.* 2003; BARC 242, 408). At least three of these are chats as circumscribed by Voelker and Spellman (2004); see introduction to Passeriformes, above. *Cyanoptila* was not among the taxa included in the recent molecular studies of the Muscicapidae by these or other authors. Given that morphological and behavioural similarities to *Muscicapa* are not in themselves definite indications of whether a taxon is a chat or muscicapine, it is not possible to confidently assign *Cyanoptila* to either group. Johnstone and Storr (2004) merged *Cyanoptila* with *Ficedula*. Here *C. cyanomelana* is listed after *Ficedula* following the sequence in Dickinson (2003).

Two species are included on the supplementary list. A reported *Muscicapa sibirica* (Dark-sided Flycatcher) from Western Australia (see Johnstone and Storr 2004), listed by Christidis and Boles (1994), has not been assessed by a rarities committee (Carter 1992). For this reason, it was not accepted by Higgins *et al.* (2006). Awaiting consideration is a report of *M. dauurica* (Asian Brown Flycatcher) observed and photographed on Ashmore Reef in 2006 (Dooley 2006a, 2007a). *Muscicapa* is a muscicapine genus and is placed at the end of the sequence.

A report of *Oenanthe oenanthe* (Northern Wheatear) on Christmas Island, cited in Johnstone and Storr (2004), was considered, but not accepted, by BARC and is omitted here.

Monticola solitarius	Blue Rock Thrush^{V}
Oenanthe isabellina	Isabelline Wheatear^{V}
Ficedula narcissina	Narcissus Flycatcher^{V}
Cyanoptila cyanomelana	Blue-and-White Flycatcher$^{V,C/V}$
Muscicapa sibirica	Dark-sided Flycatcher^{S}
Muscicapa dauurica	Asian Brown Flycatcher$^{S(A)}$

Family Turdidae

This family is represented in Australia by three breeding species – *Zoothera lunulata* (Bassian Thrush), *Z. heinei* (Russet-tailed Thrush) and *Turdus poliocephalus* (Island Thrush) – and two introduced species – *T. merula* (Common Blackbird) and *T. philomelos* (Song Thrush). Records of the last two from Lord Howe and Norfolk Islands may be derived from introduced New Zealand populations.

The conventional assumption that *Turdus* and *Zoothera* are not closely related was confirmed by Chikuni *et al.* (1996) and Klicka *et al.* (2005) using DNA sequences.

Christidis and Boles (1994) followed Ford's (1983) treatment of Australian *Zoothera* by separating the Australian populations from Eurasian *dauma* as two species: *lunulata* and *heinei*. This has been accepted by most authors (e.g. Schodde and Mason 1999; Dickinson 2003). *Zoothera heinei* also occurs in New Guinea and parts of the Bismarck Archipelago and Solomon Islands (Clement and Hathway 2000). There has been little examination of species limits and relationships within the *Z. dauma* complex by either molecular or morphological analysis. (The review of some Indonesian taxa by Collar [2004] is an exception, but no Australian species were included.) Schodde and Mason (1999) suggested that *Z. machiki* from Tanimbar Island could be conspecific with *Z. heinei* and that *Z. lunulata* is probably most closely related to *Z. dauma*. Furthermore, Schodde and Mason (1999) suggested that *Z. lunulata cuneata* from north-east Queensland could be a distinct species.

In a mitochondrial DNA sequence study of the true turdine thrushes, Klicka *et al.* (2005) included 16 of the 36 species of *Zoothera* accepted by Sibley and Monroe (1990). They found that this genus was clearly polyphyletic as constituted. Among their sample taxa, there were two main clades: one of Afro-Asian species, which are more closely related to *Turdus*, and an Asian-Australasian clade, which included the Australian species. Within the latter clade, *Z. heinei* was sister species to *Z. talaseae* of the Bismarck Archipelago and Solomon Islands. In turn, these were the sister clade of *Z. lunulata*, and together were the sister group to *Z. dauma*. Other critical forms, such as *Z. machiki* and *Z. monticola* (type species of *Zoothera*), were not included in the study. The latter has strong plumage similarities with species of the Australasian clade and it can be safely assumed that the name *Zoothera* applies to this assemblage. The two species included by Christidis and Boles (1994) are retained here, which agrees with recent practice (e.g. Clement and Hathway 2000).

Voelker *et al.* (2007) used DNA sequences from several mitochondrial genes to investigate relationships within the widespread genus *Turdus*. They recovered four major clades, which were largely, but not entirely, distributed in Africa, Central America-Caribbean, South America and Eurasia. *Turdus merula* is part of the Eurasian clade, as is *T. poliocephalus* although they are not closely related. *Turdus philomelos* falls outside all these clades, and lies near the base of the phylogenetic tree of this genus.

Up to 52 subspecies of *Turdus poliocephalus* are currently recognised (e.g. Clement and Hathway 2000), with three occurring, or having occurred, on Australian island territories: *poliocephalus* (Norfolk Island), *vinitincus* (Lord Howe Island) and *erythropleurus*

(Christmas Island) – the first two forms are extinct. Future research may delimit further species within this large and varied complex (*cf.* Collar 2005), thus affecting the status of these populations. Voekler *et al.* (2007) included representatives from the Philippines, Solomon Islands and Vanuatu. The results suggested that more than one species could be recognised. This requires a much larger taxonomic sampling of *poliocephalus* populations before such action is taken.

Zoothera lunulata	Bassian Thrush
Zoothera heinei	Russet-tailed Thrush
Turdus merula	Common Blackbird^{I}
Turdus poliocephalus	Island Thrush$^{C,LH/E,N/E}$
Turdus philomelos	Song Thrush^{I}

Family Sturnidae

Bruce and McAllan (1990) argued that the generic name *Aplornis* was the valid name, having priority over *Aplonis* by about two weeks (1 or 3 October 1836 versus 18 October 1836) and being an intentional spelling, rather than a *lapsus* (see also Mathews 1938). An application was made by Schodde and Bock (1997) to the International Commission on Zoological Nomenclature to reject *Aplornis* as part of the suppression of a larger number of names that appeared in reports of meetings before the 'formal' publication in scientific journals. This action was rejected by the Commission (ICZN 2003), and the name *Aplornis* stands as being valid, having been used for the requisite number of times in the past 50 years to avoid being ruled a disused senior synonym.

Christidis and Boles (1994) included one native breeding species (*Aplornis metallica*, Metallic Starling), one native species, now extinct (*A. fusca*, Tasman Starling) and two introduced species, *Sturnus vulgaris* (Common Starling) and *Acridotheres tristis* (Common Myna). Three additional vagrants since 1994 are now incorporated. *Aplornis cantoroides* (Singing Starling) was previously on the supplementary list), but it has now been reported several times on Torres Strait Islands (Roberts 1996; Carter *et al.* 1997; BARC 196, 204, 321), where it may be resident. *Sturnus sturninus* (Purple-backed Starling) was observed on Christmas Island (BARC 213). A record of *S. roseus* (Rosy Starling) from north-western Western Australia has been accepted (BARC 437). Further, as yet unassessed, reports of the Rosy Starling come from Cocos (Keeling) Islands and mid-north coastal New South Wales, where a bird was trapped, photographed and released.

Feare and Craig (1999) split *Sturnus* as delimited by Sibley and Monroe (1990) among five smaller genera. Although they outlined the morphological and behavioural features that characterised each group, these were not analysed in any phylogenetic manner. If the generic divisions of *Sturnus* proposed by Feare and Craig (1999) were accepted, the following names would apply to Australian taxa: *Sturnus vulgaris*, *Sturnia sturnina* and *Pastor roseus*.

Zuccon *et al.* (2006) used nuclear and mitochondrial genes to investigate the relationships within the Sturnidae. *Aplornis* falls into a clade containing a range of Asian and New Guinean genera. Of the other genera that occur in Australia, *Sturnus* was represented by five species and *Acridotheres* by two. These included the introduced *S. vulgaris* and *A. tristis,* but not *S. roseus* or *S. sturninus*. Together with monotypic *Creatophora* (*C. cinerea*, Wattled Starling, Africa), *Sturnus* and *Acridotheres* form a well-supported clade. Internal branching patterns, however, do not correspond with current generic limits. Too few species were included to test the classification of Feare and Craig (1999).

The major division is between *Sturnus vulgaris* and *S. unicolor* (Spotless Starling, southern Europe, northern Africa) and the remainder. In the latter subclade, *Acridotheres* and *Creatophora* are embedded within the other species of *Sturnus*.

Lovette and Rubenstein (2007) extended this study with molecular data from five mitochondrial genes and four nuclear intron sequences for 91 species of all 43 recently recognised genera. Their taxon sampling included six species of *Acridotheres* and 12 of *Sturnus* (including *roseus*, but not *sturninus*), as these genera are conventionally circumscribed. The results recovered the same grouping of *Sturnus* with *Acridotheres*, *Creatophora* and *Leucopsar*. Similarly, the separation of *Sturnus vulgaris-unicolor* from the remaining species was confirmed. The species of *Acridotheres* formed a monophyletic group, but were embedded within the remaining species of *Sturnus* (including *S. roseus*).

The results of these two studies can be expressed in linear classification in several ways. All species can be regarded as members of a single genus, which would take the name *Sturnus* Linnaeus, 1758. An alternative is to restrict *Sturnus* to the clade of *vulgaris–unicolor* (type species, *vulgaris* Linnaeus, 1758) and recognise the others under a different generic name, with *Acridotheres* Vieillot, 1816, having priority. If the mynas were retained at generic level exclusive of the other species, then the several successive sister groups within *Sturnus* would also have to be separated into several genera.

Pending further consideration of the *Sturnus–Acridotheres* group, the first option is adopted: all species are placed in *Sturnus* (e.g. *Sturnus tristis*).

Starlings included on the supplementary list in Christidis and Boles (1994) were *Gracula religosa* (Hill Myna) and *Sturnus* (*Acridotheres*) *cinereus* (Pale-bellied Myna). The former is known from a single record on Christmas Island, which was alledgedly an introduction, but was more likely an aviary escapee (Chasen and Kloss 1924). The latter is an apparent introduction to Christmas Island (Gibson-Hill 1947). Johnstone and Darnell (2004a) referred to this species as *A. javanicus*. Christidis and Boles (1994) discussed the attendant nomenclatural aspects of *cinereus* and *javanicus*. Both *G. religiosa* and *S. cinereus* are omitted from the supplementary list, as an ex-cage bird and a failed introduction, respectively.

Aplornis cantoroides	Singing Starling^{TS}
Aplornis fusca	Tasman Starling$^{N/E,LH/E}$
Aplornis metallica	Metallic Starling
Sturnus vulgaris	Common Starling^{I}
Sturnus sturninus	Purple-backed Starling$^{C/V}$
Sturnus roseus	Rosy Starling^{V}
Sturnus tristis	Common Myna^{I}

Family Nectariniidae

The merger of the Nectariniidae (sunbirds) and Dicaeidae (flowerpeckers) was discussed in the introduction to the Passeriformes.

Dicaeum geelvinkianum (Red-capped Flowerpecker) has been added to the list based on an increasing number of observations on Torres Strait Islands (Lansley 2004; BARC 273, 355–357, 454–455); it is likely to be resident. Salomonsen (1967b) included *geelvinkianum* in *D. pectorale* (Papuan Flowerpecker), as did Beehler *et al.* (1986) and Coates (1990), but others authors have maintained these as distinct species(e.g. Sibley and Monroe 1990; Cheke *et al.* 2001; Dickinson 2003). Further work on species limits within this and the *Dicaeum hirundinaceum* (Mistletoebird) complex is needed (Sibley and Monroe 1990, Schodde and Mason 1999).

Irwin (1999) divided the large genus *Nectarinia* into several smaller genera along perceived phyletic lines – an action followed by Fry *et al.* (2000) and Cheke *et al.* (2001). Under Irwin's classification, the Australian species would become *Cinnyris jugularis*. Bowie (2003) and Bowie *et al.* (2004), employing mitochondrial DNA sequences, did not find support for the classification of Irwin (1999). Here the Australian species is retained in *Nectarinia*.

Further work is needed on species limits within this complex (Sibley and Monroe 1990, Schodde and Mason 1999). A return to the English name Olive-backed Sunbird follows the case made by Schodde and Mason (1999); this was used by Cheke *et al.* (2002) and is in widespread use in Asia.

Dicaeum geelvinkianum	Red-capped Flowerpecker^{TS}
Dicaeum hirundinaceum	Mistletoebird
Nectarinia jugularis	Olive-backed Sunbird

Family Ploceidae

Christidis and Boles (1994) included the introduced *Euplectes orix* (Red Bishop) and *E. albonotatus* (White-winged Widowbird) on their supplementary list. Both established small breeding populations, but have been since extirpated in the wild. *Ploceus hypoxanthus* (Asian Golden Weaver) – an introduction to Cocos (Keeling) Islands (Johnstone and Darnell 2004b and references therein) – also nested for a period in the late 1800s. These three species are included on the supplementary list as introduced species that, although once established, are now extinct in Australia.

Ploceus hypoxanthus	Asian Golden Weaver$^{S(CK/I,E)}$
Euplectes albonotatus	White-winged Widowbird$^{S(I/E)}$
Euplectes orix	Red Bishop$^{S(I/E)}$

Family Estrildidae

The estrildid finches were included in the Passeridae by Christidis and Boles (1994). For reasons for their segregation into a separate family, see the introduction to the Passeriformes (above).

Schodde and Mason (1999) followed a sequence of genera and species that differed greatly from that in Christidis and Boles (1994). The latter is a more accurate representation of the revision based on protein allozyme and chromosomal data (Christidis 1987) and is largely retained here. Nevertheless, generic composition and limits within the family still require further investigation. The phylogenetic branching sequences on which Christidis (1987) based his revision did not have robust statistical support owing to the limited character base provided by protein allozyme and chromosomal data when compared with that of DNA sequences.

Baptista *et al.* (1999), also using allozyme studies, together with behaviour and vocalisations, obtained phylogenies showing a division within the estrildids: mainly between African and Asian-Australian taxa. In the latter, the Australo-Papuan grassfinches were the sister group to the mannikins (*Lonchura*) and together were sister group to *Erythrura* (parrot-finches including Gouldian Finch). In an alternative tree, the grassfinches had a sister relationship to a clade of mannikins and parrot-finches. These combined groups were then the sister clade to the African non-lonchurine estrildids. The presentation of the allozyme data presents some difficulties in assessing these results.

Sorenson and Payne (2001) recovered a similar topology to Baptista *et al.* (1999) using over 1500 nucleotide positions of mitochondrial DNA and 103 taxa. The African estrildids were the sister group to a clade comprising the Asian–Australasian grassfinches, mannikins and parrot-finches. On the basis of 1650 base pairs of the mitochondrial ND6 and control region genes, Sorenson *et al.* (2004) also found this African and Asian-Australian split. As with the previous study, the parrot-finches were the sister group to a mannikin–grassfinch clade. This work thoroughly sampled across the family, including almost all of the Australian taxa. Van der Meij *et al.* (2005) obtained a similar result among a limited taxonomic sample of estrildids: two clades – an African one and an Asian-Australasian one – the latter comprising the parrot-finches, mannikins and Australo-Papuan grassfinches.

Fry and Keith (2004: 253) cited a personal communication from M. Sorenson and R.B. Payne regarding molecular studies on the estrildids, which indicated that there were five main clusters of genera. Two of these were entirely African and a third, nearly so. The fourth consisted of 12 genera of Australasian grassfinches, although these were not listed. The fifth comprised the mannikins and relatives, including *Lonchura*, *Padda* and *Heteromunia*, occurring in Australia, and several genera that are restricted to Africa or Asia.

Sorenson *et al.* (2004) included most Australian taxa, but recovered little resolution of relationships between genera. An implication of this, and other published phylogenies of the Australian grassfinches, is that delimitation of genera and relationships between these birds should be considered more tentative than suggested by Christidis and Boles (1994) and previous authors. Until these matters are resolved with greater confidence, no change is made to the generic circumscriptions or linear sequence in Christidis and Boles (1994).

Recent practice, including Christidis and Boles (1994), has been to place the Gouldian Finch, which was previously segregated in the monotypic *Chloebia*, into *Erythrura*. A molecular phylogeny of this genus has not yet been published; however, several studies incorporating the Gouldian Finch and one parrot-finch (e.g. Baptista *et al*. 1999; Van der Meij *et al*. 2005; Sorenson *et al*. 2004), found that these had a sister relationship among the taxa used. Retention of *Chloebia* in *Erythrura* is accepted here.

The inclusion of *Padda* as a subgenus of *Lonchura* was supported by Baptista *et al.* (1999).

Whether or not the Timor form of Zebra Finch (*Taeniopygia guttata guttata*) should be treated as conspecific with that of the Australian mainland (*T. g. castanotis*) remains unresolved. Clayton *et al*. (1991) noted that *castanotis* differed from nominate *guttata* by being significantly larger, having a darker and redder bill and a proportionally larger breast band. In addition, *castanotis* has calls of lower frequency with shorter phrases consisting of fewer elements, and gives lower frequency distance calls, in which males have vocal components that are absent in the calls of nominate *guttata*. These authors also reported that, although the two forms mated assortively in captivity, hybrids were fertile. They concluded that *guttata* and *castanotis* should be treated as distinct subspecies.

The only molecular study to include both taxa was that of Baptista *et al*. (1999). That investigation was primarily concerned with relationships within the mannikins, with Zebra Finch forms included as outgroups. The data of Baptista *et al*. (1999) suggested that there were allozyme differences, but it is not possible to determine the significance of these or of the trees presented. Schodde and Mason (1999) treated them as one species, but remarked that the differences were approaching species level. Populations of the trillers *Lalage sueurii-tricolor* have similar mainland Australia and Timor populations, which are maintained as a single species in this list. In the absence of compelling evidence for either treatment, a pragmatic choice is made to handle the finches and trillers in the same way. The Australian Zebra Finch is *Taeniopygia guttata*.

Changes to the list in Christidis and Boles (1994) are the addition of *Lonchura pallida* (Pale-headed Munia) – recorded as a naturally occurring vagrant on Ashmore Reef (BARC 296, 433) – and inclusion on the supplementary list of the unassessed report of a flock of *L. tristissima* (Streak-headed Mannikin) from Saibai Island, Torres Strait (Eades 1998).

Taeniopygia guttata	Zebra Finch
Taeniopygia bichenovii	Double-barred Finch
Poephila acuticauda	Long-tailed Finch
Poephila cincta	Black-throated Finch
Poephila personata	Masked Finch
Neochmia phaeton	Crimson Finch
Neochmia ruficauda	Star Finch
Neochmia modesta	Plum-headed Finch
Neochmia temporalis	Red-browed Finch
Stagonopleura guttata	Diamond Firetail
Stagonopleura bella	Beautiful Firetail
Stagonopleura oculata	Red-eared Firetail
Emblema pictum	Painted Finch
Erythrura trichroa	Blue-faced Parrot-Finch
Erythrura gouldiae	Gouldian Finch
Lonchura punctulata	Nutmeg Mannikin^{I}
Lonchura malacca	Black-headed Mannikin^{S}
Lonchura tristissima	Streak-headed Mannikin$^{S(TS)}$
Lonchura pallida	Pale-headed Munia$^{A/V}$
Lonchura flaviprymna	Yellow-rumped Mannikin
Lonchura castaneothorax	Chestnut-breasted Mannikin
Lonchura oryzivora	Java Sparrow$^{C/I}$
Heteromunia pectoralis	Pictorella Mannikin

Family Passeridae

No inclusions or taxonomic changes have been made from the treatment in Christidis and Boles (1994); two introduced species are listed.

Passer domesticus	House Sparrow[I]
Passer montanus	Eurasian Tree Sparrow[I]

Family Motacillidae

Mitochondrial DNA sequence data have revealed that the members of the conventionally recognised *Anthus novaeseelandiae* (Richard's Pipit) complex do not form a single species (Voelker 1999a, b). The taxa *richardi* (northern Asia) and *rufulus* (southern Asia) are sister taxa, but the other members represented in the study – *cinnamomeus* (Africa) and *australis* (Australia) – are more closely related to other species. Unfortunately, there were no data on the New Zealand form (*novaeseelandiae*).

Schodde and Mason (1999) separated the Australian and New Zealand forms (including those from off shore islands) at the species level and suggested that *rogersi* (northern Australia and New Guinea) could also be a distinct species from forms of *australis* in southern Australia and Tasmania. Johnstone and Storr (2004) elevated *australis* to species level (as Australian Pipit). In the absence of molecular information regarding the Australian and New Zealand populations, *A. novaeseelandiae* is here maintained as including all Australian, New Guinean and New Zealand birds, as per Sibley and Ahlquist (1990), with the English name of Australasian Pipit. Although it may eventually be found that several species are involved, treating them here as one species at least retains a monophyletic unit.

Since Christidis and Boles (1994), two additional species have been recorded as vagrants to Australia: *Anthus cervinus* (Red-throated Pipit) from Western Australia (Carter 1997; BARC 184) and *A. gustavi* (Pechora Pipit) from Ashmore Reef (Carter 1996, 2003c; BARC 327). The latter was on the supplementary list of Christidis and Boles (1994), but is now transferred to the main list.

Voelker (2002) studied the phylogeography of *Motacilla* taxa using two mitochondrial gene sequences. Three of the nominal species recorded from Australia were paraphyletic: *flava* (Yellow Wagtail), *citreola* (Citrine Wagtail) and *alba* (White Wagtail). Work by Pavlova *et al.* (2003), using DNA sequences, and Alström and Mild (2003), based on an extensive review of plumages and vocalisations, coupled with DNA sequence work, confirmed that neither *Motacilla flava* nor *M. citreola*, as conventionally delimited, is monophyletic. There are at least three species-level taxa in the former and two in the latter.

Voelker (2002), Alström and Mild (2003) and Pavlova *et al.* (2003) were in agreement that three major lineages in conventional *M. flava* could be recognised at specific level: western (*M. flava sensu stricto*), north-eastern (*M. tschutschensis*) and south-eastern (*M. taivana*). It is possible that additional species may need to be segregated. Sangster *et al.* (1999), for example, employing the phylogenetic species concept, accepted 11.

There are numerous named forms comprising *M. flava* (*sensu lato*). Some of these may represent areas of interbreeding, and thus should not be recognised nomenclaturally. They also serve to blur the limits of subspecies distributions. While the studies cited demonstrated conclusively that *M. flava* (*sensu lato*) is polyphyletic, they did not unequivocally indicate for several taxa to which species these should be assigned. The status of some populations, and their relationships with other forms, are unsettled. Sangster *et al.* (1999) treated *macronyx* as conspecific with *M. thunbergi* – a western form. Alström and Mild (2003) also maintained *taivana* and *macronyx* as separate species, while commenting that *macronyx* and *thunbergi* are only separable by molecular markers – plumage similarities between these two taxa were considered convergent. Banks *et al.* (2004) commented that *taivana* and *macronyx* together may comprise a species.

Motacilla flava (*sensu lato*) has been recorded on Australian territory on numerous occasions and is no longer included on the list of species reviewed by BARC. There is disagreement about which of these forms occur in Australia. Schodde and Mason (1999) noted that there appear to be three plumage types recorded in this country, and several forms could potentially be observed. Those authors considered that none of the identifications of any of the records was satisfactorily confirmed.

A number of these records involve birds observed closely, often photographed, and occasionally netted, but there has been little published regarding their subspecific identification. Most records appear attributable to *M. tschutschensis* (including *simillina*), with a smaller, but substantial, number referable to *M. taivana* (see Johnstone and Storr 2004, Johnstone and Darnell 2004a, b and Hopton 2006 regarding birds recorded from Western Australia and Christmas and Cocos (Keeling) Islands.) Both species are accepted here for the Australian list. English names in use for these species are Eastern Yellow Wagtail (*tschutschensis*) and Green-headed Yellow Wagtail (*taivana*).

Other observations may represent the form *macronyx*. Until further work better clarifies its relationships, *macronyx* is tentatively treated as conspecific with *M. taivana*. The possibility of western-type birds (*flava* as delimited by recent studies) turning up cannot be dismissed either, but will require substantial documentation or a specimen.

A similar situation exists with *M. citreola*, which was found to comprise two, non-monophyletic lineages. There are few accepted Australian sightings and no specimens. Schodde and Mason (1999) commented that either of two subspecies could reach Australia. These, according to Pavlova *et al.* (2003), represent different species, *M. citreola* (*sensu stricto*) and *M. werae*. All records are regarded as *M. citreola* (*sensu lato*) at this time.

Based on hybridisation between *M. lugens* (Black-backed Wagtail) and *M. alba* (White Wagtail) in northern Japan, as well as similarities in plumages and vocalisations, Alström and Mild (2003) regarded the two taxa as conspecific. Likewise, Pavlova *et al.* (2005) concluded that their mitochrondrial DNA data (ND2 and control region) did not support specific level separation of *lugens*. As indicated by these studies, retention of *lugens* as a distinct species from *alba* makes the latter species paraphyletic. Consequently, *lugens* is returned to *alba* at subspecies level. Several subspecies have been recorded as vagrants in Australia. Pavlova *et al.* (2005) recommended that all white wagtails be considered as a single species.

The sequence follows Alström and Mild (2003).

Anthus novaeseelandiae	Australasian Pipit
Anthus cervinus	Red-throated Pipit^{V}
Anthus gustavi	Pechora Pipit$^{A/V}$
Motacilla tschutschensis	Eastern Yellow Wagtail
Motacilla taivana	Green-headed Yellow Wagtail
Motacilla citreola	Citrine Wagtail^{V}
Motacilla cinerea	Grey Wagtail^{V,C}
Motacilla alba	White Wagtail^{V}

Family Fringillidae

All members of this family in Australia were introduced directly or are vagrants of populations introduced elsewhere.

The genus *Carduelis* (*sensu lato*) is represented by three introduced species: *C. carduelis* (European Goldfinch), *C. chloris* (European Greenfinch) and *C. flammea* (Common Redpoll). Based on vocalisations and behaviour, Güttinger (1987) considered that *carduelis* and *chloris* were not particularly close. Using plumage and egg colouration characters, van den Elzen and Nemeschkal (1991) obtained trees in which *flammea* clustered closer to several other genera than to either *carduelis* or *chloris*. Fehrer (1996) examined cytochrome-*b* sequences in several cardueline finches: *carduelis*, *chloris*, *flammea*, three species of *Serinus* (canaries), *Pyrrhura* (bullfinches) and *Coccothraustes* (Hawfinch). Although the three species of *Serinus* were monophyletic, those in *Carduelis* were not.

Carduelis carduelis was closer to *Serinus*, whereas *chloris* clustered with *Pyrrhura* – the last two then linked with *Coccothraustes*. The position of *flammea* relative to the other taxa varied from analysis to analysis. For example, Sangster *et al.* (1999) did not separate *Acanthis* (redpolls), but retained these species in *Carduelis*. Arnaiz-Villena *et al.* (2001) employed cytochrome-*b* in a study of several cardueline groups other than *Carduelis*. They found that redpolls were most closely related to the crossbills (*Loxia*) than to other *Carduelis* species (*chloris* was not included in the study). A study by Chu (2002) of skeletal and plumage characters in the carduelines included only two species of *Carduelis* – the position of *flammea* relative to *C. tristis* (American Goldfinch) varied among analyses and often was not close to it.

Detailed examinations of the relationships among the carduelines – and particularly within the expanded *Carduelis* – are clearly needed. On the basis of studies thus far, it is evident that *Carduelis* as currently delimited is not a natural assemblage. It has to be either expanded to incorporate several other nominal genera or split into subunits. The latter course is adopted for the three Australian species, the respective subgenera of each being elevated to generic level, as was formerly done. Thus, the names become *Carduelis carduelis*, *Acanthis flammea* and *Chloris chloris*.

Christidis and Boles (1994) included *Acanthis flammea* as an established self-introduction to both Macquarie and Lord Howe Islands. Schodde and Mason (1999) only accepted records from Macquarie Island, pointing out that this species was not established on Lord Howe Island. McAllan *et al.* (2004) documented the occurrence of this species on Lord Howe Island, which is confirmed by specimens. Hoskin (1991) cited a record from southern Sydney, which may have been a straggler rather than an aviary escapee.

Macquarie Island birds are considered to be of the subspecies *cabaret* (Lesser Redpoll) (Schodde and Mason 1999). Knox *et al.* (2001) concluded that this should be recognised at species level; however, Ottvall *et al.* (2002) could not find evidence of genetic differentiation between *cabaret* and nominate *flammea*, and recommended that these be retained as a single species. This is followed here.

Records of *Fringilla coelebs* (Chaffinch) are assumed to involve individuals from New Zealand. This species has now been observed on both Lord Howe and Norfolk Islands (Clarke and Stephenson 2002; Fraser 2004).

Fringilla coelebs	Common Chaffinch$^{LH/VI,N/VI}$
Carduelis carduelis	European Goldfinch^{I}
Acanthis flammea	Common Redpoll$^{LH/I,M/I}$
Chloris chloris	Common Greenfinch^{I}

Family Emberizidae

Schodde and Mason (1999) excluded records of *Emberiza citrinella* (Yellowhammer) from Lord Howe Island as being insufficiently documented. Records of this species were reviewed by McAllan *et al.* (2004), who confirmed records of vagrants originating from self-introduced populations in New Zealand. Thus, it is retained on the Australian list. A report from Macquarie Island was not accepted by BARC. There are no changes from Christidis and Boles (1994).

Emberiza citrinella	Yellowhammer$^{LH/V}$

References

Abbott CL and Double MC (2003). Phylogeography of shy and white-capped albatrosses inferred from mitochondrial DNA sequences: implications for population history and taxonomy. *Molecular Ecology* **12**, 2747–2758.

Adams M, Baverstock PR, Saunders DA, Schodde R and Smith GT (1984). Biochemical systematics of the Australian cockatoos (Psittaciformes: Cacatuinae). *Australian Journal of Zoology* **32**, 363–377.

Agapow P-M, Bininda-Emonds ORP, Crandall KA, Gittleman JL, Mace GM, Marshall JC and Purvis A (2004). The impact of species concept on biodiversity studies. *Quarterly Review of Biology* **79**, 161–179.

Alexander WB, Falla RA, Jouanin C, Murphy RC, Salomonsen F, Voous KH, Watson GE, Bourne WRP, Fleming CA, Kuroda NH, Rowan MK, Serventy DL, Tickell WLN, Warham J and Winterbottom JM (1965). The families and genera of petrels and their names. *Ibis* **107**, 401–405.

Alström P and Mild K (2003). *Pipits and Wagtails*. Princeton University Press, Princeton, New Jersey.

Alström P, Ericson PGP, Olsson U and Sundberg P (2005). Phylogeny and classification of the avian superfamily Sylvioidea. *Molecular Phylogenetics and Evolution* **38**, 381–397.

Amadon D and Bull J (1988). Hawks and Owls of the World. *Proceedings of the Western Foundation of Vertebrate Zoology* **3**, 297–357.

Amadon D and Short LL (1992). Taxonomy of lower categories – suggested guidelines. *Bulletin of the British Ornithologists' Club* **Centenary Supplement 112A**, 11–38.

Ames PL (1975). The application of syringal morphology to the classification of the Old World insect eaters (Muscicapidae). *Bonnor Zoologische Beitrage* **26**, 107–134.

Andersson M (1973). Behaviour of the Pomarine skua *Stercorarius pomarinus* Temm. with comparative remarks on Stercorariinae. *Ornis Scandianavica* **4**, 1–16.

Andersson M (1999a). Hybridization and skua phylogeny. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **266**, 1579–1585.

Andersson M (1999b). Phylogeny, behaviour, plumage evolution and neotony in skuas Stercorariidae. *Journal of Avian Biology* **30**, 205–215.

Andrew P (1992). *The Birds of Indonesia – A Checklist* (*Peters' Sequence*). Indonesian Ornithological Society, Jakarta.

Andrews CW (1900). *A Monograph of Christmas Island*. British Museum (Natural History), London.

Anon (2005). Recovery Round-up. *Corella* **29**, 75.

Ansari H, Kakagi N and Sasaki M (1988). Morphological differentiation of sex chromosomes in three species of ratite birds. *Cytogenetics and Cell Genetics* **47**, 185–188.

AOU (American Ornithologists' Union). (1983). *American Ornithologists' Union Check-list of North American Birds*. 6th edn. American Ornithologists' Union, Lawrence, Kansas.

AOU (1995). Fortieth supplement to the *American Ornithologists' Union Check-list of North American Birds*. *Auk* **112**, 819–830.

AOU (1998). *American Ornithologists' Union Check-list of North American Birds*. 7th edn. American Ornithologists' Union, Lawrence, Kansas.

Aragón S, Møller AP, Soler JJ and Soler M (1999). Molecular phylogeny of cuckoos supports a polyphyletic origin of brood parasitism. *Journal of Evolutionary Biology* **12**, 495–506.

Archibald GW (1976). Crane taxonomy as revealed by the unison call. In *Crane Research Around the World* (Eds JC Lewis and H Masatimi) pp. 225–251. International Crane Foundation, Baraboo, Wisconsin.

Archibald GW and Meine CD (1996). Family Gruidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 60–89. Lynx Edicions, Barcelona.

Armstrong MH, Braun E and Kimball RT (2001). Phylogenetic utility of avian ovomucoid intron G: A comparison of nuclear and mitochondrial phylogenies in Galliformes. *Auk* **118**, 799–804.

Arnaiz-Villena A, Guillen J, Ruiz-del-Valle V, Lowy E, Zamora J, Varela P, Stefani D and Allende, LM (2001). Phylogeography of crossbills, bullfinches, grosbeaks, and rosefinches. *Cellular and Molecular Life Sciences* **58**, 1159–1166.

Astuti D, Azuma N, Suzuki H and Higashi S (2006). Phylogenetic relationships within parrots (Psittacidae) inferred from mitochondrial cytochrome-*b* gene sequences. *Zoological Science* (*Tokyo*) **23**, 191–198.

Austin JJ (1996). Molecular phylogenetics of *Puffinus* shearwaters: Preliminary evidence from mitochondrial cytochrome *b* gene sequences. *Molecular Phylogenetics and Evolution* **6**, 77–88.

Austin JJ, Bretagnolle V and Pasquet E (2004). A global molecular phylogeny of the small *Puffinus* shearwaters and implications for systematics of the Little-Audubon's shearwater complex. *Auk* **121**, 847–864.

Avise JC and Zink RM (1988). Molecular genetic divergence between avian sibling species: King and Clapper Rails, Long-billed and Short-billed Dowitchers, Boat-tailed and Great-tailed Grackles, and Tufted and Black-crested Titmice. *Auk* **105**, 516–528.

Avise JC, Nelson WS and Sibley CG (1994a). DNA sequence support for a close phylogenetic relationship between some storks and New World vultures. *Proceedings of the National Academy of Science, USA* **91**, 5173–5177.

Avise JC, Nelson WS and Sibley CG (1994b). Why one-kilobase sequences from mitochondrial DNA fail to solve the hoatzin phylogenetic enigma. *Molecular Phylogenetics and Evolution* **3**, 175–184.

Avise JC, Nelson WS and Sibley CG (1995). Correction to Avise *et al.* (1994). *Proceedings of the National Academy of Science, USA* **92**, 3076.

Baker AJ (1975). Morphological variation, hybridization and systematics of New Zealand oystercatchers (Charadriiformes: Haematopodidae). *Journal of Zoology, London* **175**, 357–390.

Baker AJ (1977). Multivariate assessment of the phenetic affinities of Australasian oystercatchers (Aves: Charadriiformes). *Bijdragen Tot de Dierkunde* **47**, 156–164.

Baker AJ and Strauch JG Jr (1988). Genetic variation and differentiation in shorebirds. In *Proceedings of the 19th International Ornithological Congress* (Ed. H Ouellet) pp. 1639–1645. National Museum of Natural Sciences, Ottawa.

Baker AJ, Lynch A and Edwards C (1985). Biochemical genetic studies of shorebirds: methods and applications. *Wader Study Group Bulletin* **44**, 34–39.

Baker AJ, Pereira SL, Haddrath OP and Edge K-A (2006). Multiple gene evidence for expansion of extant penguins out of Antarctica due to global cooling. *Proceedings of the Royal Society Biological Sciences Series B* **273**, 11–17.

Baker AJ, Pereira SL and Paton TA (2007). Phylogenetic relationships and divergence times of Charadriiformes genera: multigene evidence for the Cretaceous origin of at least 14 clades of shorebirds. *Biology Letters* **3**, 205–209.

Baker-Gabb D (1989). Why *Haliastur* and *Milvus* should remain separate genera. *Australasian Raptor Association News* **10**, 45–46.

Banks JC, Mitchell AD, Waas JR and Paterson AM (2002). An unexpected pattern of molecular divergence within the blue penguin (*Eudyptula minor*) complex. *Notornis* **49**, 29–38.

Banks RC, Cicero C, Dunn JL, Kratter AW, Rasmussen PC, Remsen JV Jr, Rising JD and Stotz DF (2004). Forty-fifth supplement to the *American Ornithologists' Union Check-list of North American Birds. Auk* **121**, 985–995.

Baptista LF, Trail PW and Horblit HM (1997). Columbiformes. In *Handbook of the Birds of the World. Vol. 4. Sandgrouse to Cuckoos* (Eds J del Hoyo, A Elliot and J Sargatal) pp.60–243. Lynx Edicions, Barcelona.

Baptista LF, Lawson R, Visser E and Bell DA (1999). Relationships of some mannikins and waxbills in the Estrildidae. *Journal für Ornithologie* **140**, 179–192.

Barbraud C and Jouventin P (1998). What causes body size variation in the Snow Petrel *Pagodroma nivea*? *Journal of Avian Biology* **29**, 161–171.

Barker FK, Barrowclough GF and Groth JG (2001). A phylogenetic hypothesis for passerine birds: taxonomic and biogeographic implications of an analysis of nuclear DNA sequence data. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **269**, 295–308.

Barker FK, Cibois A, Schikler P, Feinstein J and Cracraft J (2004). Phylogeny and diversification of the largest avian radiation. *Proceedings of the National Academy of Science, USA* **101**, 11040–11045.

Barrand PD, James DJ and O'Brien RM. (2006). Schrenck's Bittern *Ixobrychus eurhythmus* on Christmas Island: a new bird for Australian Territory. *Australian Field Ornithology* **23**, 57–61.

Barré H, Derenne P, Mougin J-L and Voisin J-F (1976). Le goitous de Schlegel des iles Crozet. *Comité National Français Recherches Antarctiques* **40**, 177–189.

Barrett G, Silcocks A, Barry S, Cunningham R and Poulter R (2003). *The New Atlas of Australian Birds*. Royal Australasian Ornithologists Union, Hawthorn East.

Barrowclough GF, Corbin KW and Zink RM (1981). Genetic differentiation in the Procellariiformes. *Comparative Biochemistry and Physiology B* **69**, 629–632.

Barrowclough GF, Groth JG and Mertz LA (2006). The RAG-1 exon in the avian order Caprimulgiformes: Phylogeny, heterozygosity, and base composition. *Molecular Phylogenetics and Evolution* **41**, 238–248.

Bartram K (1999). Geographical variation in *Cyclopsitta diophthalma*. In *Handbook of Australian, New Zealand and Antarctic Birds*. Vol. 4. Parrots to Dollarbird (Ed. PJ Higgins) pp.266–268.Oxford University Press, Melbourne.

Baverstock PR, Schodde R, Christidis L, Krieg M and Birrell J (1992). Evolutionary relationships of the Australasian mud-nesters (Grallinidae, Corcoracidae): immunological evidence. *Australian Journal of Zoology* **40**, 173–179.

Baxter C (1995). *An Annotated List of Birds of Kangaroo Island*. Department of Environment and Natural Resources, Kingscote.

Beddard FE (1896). Contributions to the anatomy of picarian birds.– Part III. On some points in the anatomy of the kingfishers. *Proceedings of the Zoological Society of London* **1896**, 603–606.

Beehler BM and Finch BW (1985). Species-checklist of the Birds of New Guinea. *Australasian Ornithological Monograph 1*. Royal Australasian Ornithologists Union, Melbourne.

Beehler BM and Swaby RJ (1991). Phylogeny and biogeography of the *Ptiloris* riflebirds (Aves: Paradisaeidae). *Condor* **93**, 738–745.

Beehler BM, Pratt TK and Zimmerman DA (1986). *Birds of New Guinea*. Princeton University Press, Princeton, New Jersey.

Beresford P, Barker FK, Ryan PG and Crowe TM (2005). African endemics span the tree of songbirds (Passeri): molecular systematics of several evolutionary 'enigmas'. *Journal of the Royal Society of London, Series B, Biological Sciences* **272**, 849–858.

Berger AJ (1955). On the anatomy and relationships of glossy cuckoos of the Genera *Chrysococcyx*, *Lampromorpha*, and *Chalcites*. *Proceedings of the United States National Museum* **103**, 585–597.

Berman, S and Raikow RJ (1982). The hind limb musculature of the mousebird (Coliiformes). *Auk* **99**, 41–57.

Bertelli S and Giannini NP (2005). A phylogeny of extant penguins (Aves: Sphenisciformes) combining morphology and mitochondrial sequences. *Cladistics* **21**, 209–239.

Beruldsen GR (2002). Spotted Whistling-Duck *Dendrocygna guttata*—probable breeding in Australia. *Australian Bird Watcher* **19**, 43–46.

Bickart KJ (1981). A new thick-knee, *Burhinus*, from the Miocene of Nebraska, with comments on the habitat requirements of the Burhinidae. *Journal of Vertebrate Palaeontology* **1**, 273–277.

Birks SM and Edwards SV (2002). A phylogeny of the megapodes (Aves: Megapodiidae) based on nuclear and mitochondrial DNA sequences. *Molecular Phylogenetics and Evolution* **23**, 408–421.

Birt TP, Friesen VL, Green JM, Montevecchi WA and Davidson WS (1992). Cytochrome-*b* sequence variation among parrots. *Hereditas* **117**, 67–72.

Björkland M (1994). Phylogenetic relationships among Charadriiformes: reanalysis of previous data. *Auk* **111**, 825–832.

Black AB (2004). The 'Immarna' grasswrerns of R.C. Chandler: locality, habitat, identity and taxonomic implications. *South Australian Ornithologist* **34**, 199–211.

Blechschmidt K, Peter H-U, Korte JD, Wink M, Seibold I and Helbig AJ (1993). Untersuchungen zur molekularen Systematik der Raubmöwen (Stercorariidae). *Zoologische Jahrbücher. Abteilung für Systematik*, *Öekologie und Geographie der Tiere* **120**, 379–387.

Bledsoe AH (1988). A phylogenetic analysis of postcranial skeletal characters of the ratite birds. *Annals of Carnegie Museum* **57**, 73–90.

Bleiweiss R, Kirsch JAW and Lapointe F-J (1994). DNA-DNA hybridizations-based phylogeny for 'higher' nonpasserines: reevaluating a key portion of the avian family tree. *Molecular Phylogenetics and Evolution* **3**, 248–255.

Bocheński ZM (1994). The comparative osteology of grebes (Aves: Podicipediformes) and its systematic implications. *Acta Zoologica Cracoviensia* **37**, 191–346.

Bock WJ (1956). A generic review of the family Ardeidae (Aves). *American Museum Novitates* **1779**, 1–49.

Bock WJ (1958). A generic review of the plovers (Charadriinae, Aves). *Bulletin of the Museum of Comparative Zoology* **118**, 27–97.

Bock WJ (1994). History and nomenclature of avian family-group names. *Bulletin of the American Museum of Natural History* **222**, 1–281.

Bock WJ and Clench MH (1985). Morphology of the Noisy Scrub-bird, *Atrichornis rufescens* (Passeriformes: Atrichornithidae): systematic relationships and summary. *Records of the Australian Museum* **37**, 243–254.

Bock WJ and Farrand J Jr (1980). The number of species and genera of recent birds: a contribution to comparative systematics. *American Museum Novitates* **2703**, 1–29.

Boles WE (1979). Comments on *Sericornis beccarii* in southern Cape York Peninsula. *Sunbird* **10**, 70–72.

Boles WE (1999a). Comments on the sternal morphology of Australasian pigeons. *Bulletin of the British Ornithologists' Club* **119**, 144–150.

Boles WE (1999b). A new songbird (Aves: Passeriformes: Oriolidae) from the Miocene of Riversleigh, northwestern Queensland, Australia. *Alcheringa* **23**, 51–56.

Boles WE (2005). A new flightless gallinule (Aves: Rallidae: *Gallinula*) from the Oligo-Miocene of Riversleigh, northwestern Queensland, Australia. *Records of the Australian Museum* **57**, 179–190.

Boles WE (2006). Family Rhipiduridae. In *Handbook of the Birds of the World. Vol. 11. Old World Flycatchers to Old World Warblers* (Eds J del Hoyo, A Elliot and D Christie) pp. 200–242. Lynx Edicions, Barcelona.

Boles WE and Longmore NW (1985). Generic allocation of the Tawny-crowned Honeyeater. *South Australian Ornithologist* **39**, 221–223.

Boles WE, Bartram K and Clancy GP (1985). First Australian specimen of the White-necked Petrel. *Australian Birds* **19**, 51–54.

Bonaparte CL (1849). *Conspectus Systematis Ornithologiae*. M Westerman and Fil, Amsterdam.

Bonaparte CL (1855). *Conspectus Generum Avium*. Vol. 2. Lugduni Batavorum and E. J. Brill, Leyden.

Boon WM, Kearvell JC, Daugherty CH and Chambers GK (2000). Molecular systematics of New Zealand Cyanoramphus parakeets: conservation of Orange-fronted and Forbes' Parakeets. *Bird Conservation International* **10**, 211–219.

Boon WM, Daugherty CH and Chambers GK (2001a). The Norfolk Island Green Parrot and New Caledonian Red-crowned Parakeet are distinct species. *Emu* **101**, 113–121.

Boon WM, Kearvell JC, Daugherty CH and Chambers GK (2001b). Molecular systematics and conservation of kakariki (*Cyanoramphus* spp.). *Science for Conservation* **176**. Department of Conservation, Wellington, New Zealand.

Borowik OA (1996). Molecular Systematics and the Evolution of Mating Systems in Calidridine Sandpipers. PhD thesis, University of Toronto, Toronto, Canada.

Borowik OA and McLennan DA (1999). Phylogenetic patterns of parental care in calidridine sandpipers. *Auk* **116**, 1107–1117.

BOU (British Ornithologists' Union) (2005) British Ornithologists' Union Records Committee: 31st Report (October 2004). *Ibis* **147**, 246–250.

Bourne WRP (1962). Subspecies of *Puffinus carneipes*. In *Handbook of North American Birds. Vol. 1. Loons through Flamingos* (Ed. RS Palmer) p. 162. Yale University Press, New Haven, Connecticut.

Bourne WRP (1968). Notes on diving-petrels *Bulletin of the British Ornithologists' Club* **88**, 77–85.

Bourne WRP (1974). Notes on some subfossil petrels from the New Zealand area, including a cranium of the subgenus *Cookilaria* from Lord Howe Island. *Emu* **74**, 257–258.

Bourne WRP (1983). The Soft-plumaged Petrel, the Gon-gon and the Freira, *Pterodroma mollis*, *P. feae* and *P. madeira*. *Bulletin of the British Ornithologists' Club* **103**, 52–58.

Bourne WRP (1987a). The classification and nomenclature of the petrels. *Ibis* **129**, 404.

Bourne WRP (1987b). The affinities, breeding behaviour and distribution of Jouanin's Petrel *Bulweria fallax*. *Bulletin of the British Ornithologists' Club* **107**, 4–6.

Bourne WRP (1989). The evolution, classification and nomenclature of the great albatrosses. *Le Gerfaut* **79**, 105–116.

Bourne WRP (1999). Albatross names. *Notornis* **46**, 498–499.

Bourne WRP (2001). The status of the genus *Lugensa* Mathews and the birds collected by Carmichael on Tristan da Cunha in 1816–1817. *Bulletin of the British Ornithologists' Club* **121**, 215–216.

Bourne WRP and Elliott HFI (1965). The correct name for the Kerguelen Petrel. *Ibis* **107**, 548–550.

Bourne WRP and Jehl JR Jr (1982). Variation and nomenclature of Leach's Storm-Petrels. *Auk* **99**, 793–797.

Bourne WRP and Warham JP (1966). Geographical variation in the giant petrels of the genus *Macronectes*. *Ardea* **54**, 45–67.

Bowie RCK (2003). Birds, Molecules and Evolutionary Patterns among Africa's Islands in the Sky. PhD thesis, University of Cape Town, South Africa.

Bowie RCK, Fjeldså J, Hackett SJ and Crowe TM (2004) Molecular evolution in space and though time: mtDNA phylogeography of the Olive Sunbird (*Nectarinia olivacea/obscura*) throughout continental Africa. *Molecular Phylogenetics and Evolution* **33**, 56–76.

Braun EL and Kimball RT (2002). Examining basal avian divergences with mitochondrial sequences: model complexity, taxon sampling, and sequence length. *Systematic Biology* **51**, 614–625.

Braun MJ and Brumfield RT (1998). Enigmatic phylogeny of skuas: an alternative hypothesis. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **265**, 995–999.

Bretagnolle V (1995). Systematics of the Soft-plumaged Petrel *Pterodroma mollis* (Procellariidae): new insight from the study of vocalizations. *Ibis* **137**, 207–218.

Bretagnolle V, Zotier R and Jouventin P (1990). Comparative population biology of four prions (genus *Pachyptila*) from the Indian Ocean and consequences for their taxonomic status. *Auk* **107**, 305–316.

Bretagnolle V, Attie C and Pasquet E (1998). Cytochrome-*b* evidence for validity and phylogenetic relationships of *Pseudobulweria* and *Bulweria* (Procellariidae). *Auk* **115**, 188–195.

Bridge ES, Jones AW and Baker AJ (2005). A phylogenetic framework for the terns (Sternini) inferred from mtDNA sequences: implications for taxonomy and plumage evolution. *Molecular Phylogenetics and Evolution* **35**, 459–469**.**

Britton PL and Britton HA (2000). Birds of Charters Towers, north Queenland [sic]. *Sunbird* **30**, 61–88.

Broders O, Osborne T and Wink M (2003). A mtDNA phylogeny of bustards (family Otididae) based on nucleotide sequences of the cytochrome *b*-gene. *Journal für Ornithologie* **144**, 176–185.

Brom TG and Dekker RWRJ (1992). Current studies on megapode phylogeny. In *Proceedings of the First International Megapode Symposium*, Christchurch, New Zealand, December 1990 (Eds RWRJ Dekker and DN Jones). *Zoologische Verhandelingen* **278**, 7–17.

Brooke M (2004). *Albatrosses and Petrels Across the World*. Oxford University Press, Oxford.

Brooke MdeL and Rowe G (1996). Behavioural and molecular evidence for specific status of light and dark morphs of the Herald Petrel *Pterodroma heraldica*. *Ibis* **138**, 420–432.

Brooke RK (1970). Taxonomic and evolutionary notes on the subfamilies, tribes, genera and subgenera of the swifts (Aves: Apodidae). *Durban Museum Novitates* **9**, 13–24.

Brooke RK (1971). Geographical variation in the Little Swift *Apus affinis* (Aves: Apodidae). *Durban Museum Novitates* **9**, 93–103.

Brooke RK (1972). Generic limits in Old World Apodidae and Hirundinidae. *Bulletin of the British Ornithologists' Club* **92**, 53–57.

Brooke RK (1978a). Apodidae. In *An Atlas of Speciation in African Non-passerine Birds* (Ed. DW Snow) pp. 278–287. Trustees of the British Museum (Natural History), London.

Brooke RK (1978b). The *Catharacta* skuas (Aves: Laridae) occurring in South African waters. *Durban Museum Novitates* **11**, 295–308.

Brown DM and Toft CA (1999). Molecular systematics and biogeography of the cockatoos (Psittaciformes: Cacatuidae). *Auk* **116**, 141–157.

Brown L and Amadon D (1968). *Eagles, Hawks and Falcons of the World*. Country Life Books, Middlesex.

Browning MR (1989). The correct name for the Olivaceous Cormorant, 'Maiague' of Piso (1658). *Wilson Bulletin* **101**, 101–106.

Browning MR and Monroe BL Jr (1991). Clarifications and corrections of the dates of issue of some publications containing descriptions of North American birds. *Archives of Natural History* **18**, 381–405.

Bruce MD (1989). A reappraisal of species limits in the Pied Imperial Pigeon *Ducula bicolor* (Scopoli, 1786) superspecies. *Rivista Italiana di Ornithologica* **59**, 218–222.

Bruce MD (1999). Family Tytonidae. In *Handbook of the Birds of the World. Vol. 5. Barn-owls to Hummingbirds* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 34–75. Lynx Edicions, Barcelona.

Bruce MD and McAllan IAW (1990). Some problems in vertebrate nomenclature. II. Birds. Part 1. *Bollettino del Museo Regionale di Scienze Naturali* **8**, 453–485.

Bruce MD and McAllan IAW (1999). Comment on the proposed suppression of all prior usages of generic and specific names of birds (Aves) by John Gould and others conventionally accepted as published in the *Proceedings of the Zoological Society of London*. *Bulletin of Zoological Nomenclature* **56**, 274–279.

Bruce MD and McAllan IAW (2000). Comments on the proposed suppression of all prior usages of generic and specific names of birds (Aves) by John Gould and others conventionally accepted as published in the *Proceedings of the Zoological Society of London*. *Bulletin of Zoological Nomenclature* **57**, 113.

Bunce M, Szulkin M, Lerner HRL, Barnes I, Shapiro B, Cooper A and Holdaway RN (2005). Ancient DNA provides new insights into the evolutionary history of New Zealand's extinct giant eagle. *PLoS Biology* **3(1)**. <http://biology.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pbio.0030009>. Accessed 04 March 2007.

Burg TM and Croxall JP (2001). Global relationships amongst black-browed and grey-headed albatrosses: analysis of population structure using mitochondrial DNA and microsatellites. *Molecular Ecology* **10**, 2547–2660.

Burg TM and Croxall JP (2004). Global population structure and taxonomy of the wandering albatross species complex. *Molecular Ecology* **13**, 2345–2355.

Burger AE (1978). Interspecific breeding attempts by *Macronectes giganteus* and *M. halli*. *Emu* **78**, 234–235.

Burger J and Gochfeld M (1996). Family Laridae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 572–623. Lynx Edicions, Barcelona.

Burt DB (2004). Plumage-based phylogenetic analyses of the *Merops* bee-eaters. *Ibis* **146**, 481–492.

Burton PJK (1984). Anatomy and evolution of the feeding apparatus in the avian orders Coraciiformes and Piciformes. *Bulletin of the British Museum* (*Natural History*) **47**, 331–443.

Bush KL and C. Strobeck C (2003). Phylogenetic relationships of the Phasianidae reveals possible non-pheasant taxa. *Journal of Heredity* **94**, 472–489.

Byrkjedal I and Thompson D (1998). *Tundra Plovers: The Eurasian, Pacific and American Golden Plovers and Grey Plover*. Princeton University Press, Princeton, New Jersey.

Cain AJ (1955). A revision of *Trichoglossus haematodus* and of the Australian platycercine parrots. *Ibis* **97**, 432–479.

Campbell J and Minton C (1995). Long-billed Dowitcher – a new wader in Australia. *Stilt* **27**,16.

Campbell KE Jr (1979). The non-passerine Pleistocene avifauna of the Talara Tar Seeps, northwestern Peru. *Royal Ontario Museum, Life Sciences Contribution* **118,** 1–203.

Carboneras C (1992a). Family Anatidae. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 536–628. Lynx Edicions, Barcelona.

Carboneras C (1992b). Order Procellariiformes. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 198–278. Lynx Edicions, Barcelona.

Carboneras C. (1992c). Family Sulidae. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 312–325. Lynx Edicions, Barcelona.

Carter M (1988). Audubon's Shearwater *Puffinus Iherminieri* in Australia. *Australian Bird Watcher* **12**, 141–149.

Carter M (1992). Australian bird species. How many are there? *Bird Observer* **721**, 2–4.

Carter M (1994a). Birds of Australia's Christmas Island. *Wingspan* **13**, 18–21.

Carter M (1994b). Birds of the Cocos-Keeling Islands. *Wingspan* **15**, 14–18.

Carter M (1996). Pechora Pipit: awaited but unconfirmed. *Australian Birding* **3(1)**, 19.

Carter M (1997). Red-throated Pipit *Anthus cervinus* in Australia. *Australian Bird Watcher* **17**, 3–10.

Carter M (1998). SIPO or OZPO? South Island Pied Oystercatcher *Haematopus finschi* not Pied Oystercatcher *H. longirostris* on Norfolk Island. *Australian Birding* **4(4)**, 16–19.

Carter M (1999a). Little Grebe *Tachybaptus ruficollis*. *Bird Observer* **803**, 20–21.

Carter M (1999b). South Island Pied Oystercatcher discovered on the Australian Mainland. *Australian Birding* **5(1)**, 14–15, 23.

Carter M (2000a). Little Grebe at Darwin. *Australian Birding* **6(1)**, 18.

Carter M (2000b) Identification of Red-rumped and Striated Swallows *Hirundo daurica* and *H. striolata* in Australasia. *Australian Birding* **6(2)**, 9–18.

Carter M (2003a). Jouanin's Petrel *Bulweria fallax* in Australia. *Australian Field Ornithology* **20**, 69–76.

Carter M (2003b). Cinnamon Bittern *Ixobrychus cinnamomeus* on Christmas Island: a new bird for Australian Territory. *Australian Field Ornithology* **20**, 55–58.

Carter M (2003c). Pechora Pipit *Anthus gustavi* in Australia. *Australian Field Ornithology* **20**, 59–65.

Carter M (2006). Canada Goose *Branta canadensis* first Australian mainland occurrence. *Australian Field Ornithology* **23**, 15–19.

Carter M and Menkhorst P (2006). Nominate subspecies of the Little Egret *Egretta garzetta garzetta* in Australian territory. *Australian Field Ornithology* **23**, 104–108.

Carter M and Shaw R (1999). Blue Rock-Thrush *Monticola solitarius*: first record for Australia. *Australian Bird Watcher* **18**, 101–105.

Carter M, O'Brien R and Macumber N (1997). Singing Starlings *Aplonis cantoroides* and other birds on Boigu Island, Torres Strait, Queensland. *Australian Bird Watcher* **17**, 20–24.

Chambers GK and Boon WM (2005). Molecular systematics of Macquarie Island and Reischek's parakeets. *Notornis* **52**, 249–250.

Chantler P (1999). Family Apodidae. In *Handbook of the Birds of the World. Vol. 5. Barn-owls to Hummingbirds* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 388–457. Lynx Edicions, Barcelona.

Chantler P and Driessen, G (1995). *Swifts. A Guide to the Swifts and Treeswifts of the World*. Pica Press, Sussex.

Chasen FN (1933). Notes on the fauna of Christmas Island, Indian Ocean. *Bulletin of the Raffles Museum* **8**, 51–87.

Chasen FN and Kloss GB (1924). Some birds of Christmas Island (Indian Ocean). *Journal of the Straits Branch of the Royal Asiatic Society* **2**, 65–68.

Cheke RA, Mann CF and Allen R (2001). *Sunbirds. A Guide to the Sunbirds, Flowerpeckers, Spiderhunters and Sugarbirds of the World*. Christopher Helm, London.

Chikuni K, Minaka N and Ikenaga H (1996). Molecular phylogeny of some Passeriformes, based on cytochrome *b* sequences. *Journal of the Yamashina Institute of Ornithology* **28**, 1–8.

Christian PD, Christidis L and Schodde R (1992a). Biochemical systematics of the Charadriiformes (shorebirds): relationships between the Charadrii, Scolopaci and Lari. *Australian Journal of Zoology* **40**, 291–302.

Christian PD, Christidis L and Schodde R (1992ba). Biochemical systematics of the Australian dotterels and plovers (Charadriiformes: Charadriidae). *Australian Journal of Zoology* **40**, 225–233.

Christidis L (1990). *Animal Cytogenetics*. Vol. 4: Chordata, 4B-Aves. Gebrüder Borntraeger, Berlin.

Christidis L (1999). Evolution and biogeography of the Australian grasswrens, *Amytornis* (Aves: Maluridae): biochemical perspectives. *Australian Journal of Zoology* **47**, 113–124.

Christidis L and Boles WE (1994). *The Taxonomy and Species of Birds of Australia and its Territories*. RAOU Monograph No. 2. Royal Australasian Ornithologists Union, Melbourne.

Christidis L and Schodde R (1991a). Relationships of Australo-Papuan songbirds (Aves: Passeriformes): protein evidence. *Ibis* **133**, 277–285.

Christidis L and Schodde R (1991b). Genetic differentiation in the White-browed Scrubwren *Sericornis frontalis* complex (Aves: Acanthizidae). *Australian Journal of Zoology* **39**, 709–718.

Christidis L and Schodde R (1993). Relationships and radiations in the meliphagine honeyeaters, *Meliphaga*, *Lichenostomus* and *Xanthotis* (Aves: Meliphagidae): protein evidence and its integration with morphology and ecogeography. *Australian Journal of Zoology* **41**, 293–316.

Christidis L and Schodde R (1997). Relationships within the Australo-Papuan fairy-wrens (Aves: Malurinae): an evaluation of the utility of allozyme data. *Australian Journal of Zoology* **45**, 113–129.

Christidis L, Schodde R, Shaw, DD and Maynes SF (1991a). Relationships among the Australo-Papuan parrots, lorikeets and cockatoos (Aves: Psittaciformes): protein evidence. *Condor* **93**, 302–317.

Christidis L, Shaw DD and Schodde R (1991b). Chromosomal evolution in parrots, lorikeets and cockatoos (Aves: Psittaciformes). *Hereditas* **114**, 47–56.

Christidis L, Davies K, Westerman M, Christian PD and Schodde R (1996). Molecular assessment of the taxonomic status of Cox's Sandpiper. *Condor* **98**, 459–463.

Chu, PC (1995). Phylogenetic reanalysis of Strauch's osteological data set for the Charadriiformes. *Condor* **97**, 174–196.

Chu, PC (1998). A phylogeny of the gulls (Aves: Larinae) inferred from osteological and integumentary characters. *Cladistics* **14**, 1–43.

Chu PC (2002). A morphological test of the monophyly of the cardueline finches (Aves: Fringillidae, Carduelinae). *Cladistics* **18**, 279–312.

Chubb AL (2004a). New nuclear evidence for the oldest divergence among neognath birds: the phylogenetic utility of ZENK (i). *Molecular Phylogenetics and Evolution* **30**, 140–151.

Chubb AL (2004b). Nuclear corroboration of DNA-DNA hybridization in deep phylogenies of hummingbirds, swifts, and passerines: the phylogenetic utility of ZENK (ii). *Molecular Phylogenetics and Evolution* **30**, 128–139.

Cibois A (2003a). Mitochondrial DNA phylogeny of babblers (Timaliidae). *Auk* **120**, 35–54.

Cibois A (2003b). *Sylvia* is a babbler: taxonomic implications for the families Sylviidae and Timaliidae. *Bulletin of the British Ornithologists' Club* **123**, 257–261.

Cibois A and Cracraft J (2004). Assessing the passerine 'Tapestry': phylogenetic relationships of the Muscicapoidea inferred from nuclear DNA sequences. *Molecular Phylogenetics and Evolution* **32**, 264–273.

Clark GA, Jr (1964a). Ontogeny and evolution in the megapodes (Aves: Galliformes). *Postilla* **78**, 1–37.

Clark GA, Jr (1964b). Life histories and the evolution of megapodes. *Living Bird* **3**, 149–167.

Clark WS and Banks RC (1992). The taxonomic status of the White-tailed Kite. *Wilson Bulletin* **104**, 571–579.

Clarke RH (2003). Oriental Honey Buzzard *Pernis ptilorhyncus* on Christmas Island, Indian Ocean, Australia. *Australian Field Ornithology* **20**, 33–37.

Clarke RH (2006). Papuan Spine-tailed Swifts *Meamsia novaeguineae* on Boigu Island, Torres Strait, Queensland. *Australian Field Ornithology* **23**, 125–129.

Clarke RH and Stephenson BM (2002). A record of the Common Chaffinch *Fringilla coelebs* on Philip Island (Norfolk Island Group), Australia. *Australian Bird Watcher* **19**, 225–229.

Clarke RH, Gordon IR and Clarke MF (2001). Intraspecific phenotypic variability in the Black-eared Miner: human-facilitated introgression and the consequences for an endangered taxon. *Biological Conservation* **99**, 145–155.

Clay T (1975). Feather lice. In *Flamingos* (Eds J Kear and N Duplaix-Hall) pp. 159–161. Poyser, Berkhamsted.

Clayton NS, Hodson D and Zann RA (1991). Geographic variation in Zebra Finch subspecies. *Emu* **91**, 2–11.

Cleere N (1998). *Nightjars: A Guide to Nightjars and Related Nightbirds of the World*. Pica Press, Robertsbridge, Sussex.

Cleere N (1999). Family Caprimulgidae. In *Handbook of the Birds of the World. Vol. 5. Barn-owls to Hummingbirds* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 302–386. Lynx Edicions, Barcelona.

Cleere N, Kratter AW, Steadman DW, Braun MJ, Huddleston CJ, Filardi CE and Dutson G. (2007). A new genus of frogmouth (Podargidae) from the Solomon Islands – results from a taxonomic review of *Podargus ocellatus inexpectatus* Hartert 1901. *Ibis* **149**, 271–286.

Clement P and Hathway R (2000). *Thrushes*. Christopher Helm, London.

Clements JF (2000). *Birds of the World: A Checklist*. 5th edn. Ibis Publishing Company, Vista, California.

Coates BJ (1985). *The Birds of Papua New Guinea. Vol. 1. Non-passerines.* Dove Publications, Alderley, Queensland.

Coates BJ (1990). *The Birds of Papua New Guinea. Vol. 2. Passerines.* Dove Publications, Alderley, Queensland.

Coates BJ and Bishop KD (1997). *A Guide to the Birds of Wallacea. Sulawesi, The Moluccas and Lesser Sunda Islands, Indonesia*. Dove Publications, Alderley, Queensland.

Cohen BL, Baker AJ, Blechschmidt K, Dittmann DL, Furness RW, Gerwin JA, Helbig AJ, de Korte J, Marshall HD, Palma RL, Peter H–U, Ramli R, Siebold I, Willcox MS, Wilson RH and Zink RM (1997). Enigmatic phylogeny of skuas (Aves: Stercorariidae). *Proceedings of the Royal Society of London, Series B, Biological Sciences* **264**, 181–190.

Collar NJ (1996). Family Otididae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 240–271. Lynx Edicions, Barcelona.

Collar NJ (1997a). Taxonomy and conservation: chicken and egg. *Bulletin of the British Ornithologists' Club* **117**, 122–136.

Collar NJ (1997b). Family Psittacidae. *Handbook of the Birds of the World. Vol. 4. Sandgrouse to Cuckoos* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 280–477. Lynx Edicions, Barcelona.

Collar NJ (2004). Species limits in some Indonesian thrushes. *Forktail* **20**, 71–87.

Collar NJ (2005). Family Turdidae. In *Handbook of the Birds of the World. Vol. 10. Cuckoo-shrikes to Thrushes* (Eds J del Hoyo, A Elliot and DA Christie) pp. 514–807. Lynx Edicions, Barcelona.

Collins CT (2000). Subfamilies of the swifts (Apodiformes: Apodidae): *Schoutenenapus* revisited. *Durban Museum Novitates* **25**, 36–39.

Condon HT (1951). Notes on the birds of South Australia: occurrence, distribution and taxonomy. *South Australian Ornithologist* **20**, 26–68.

Condon HT (1975). *Checklist of the Birds of Australia, Part 1. Non-passerines.* Royal Australasian Ornithologists Union, Melbourne.

Connors PG (1983). Taxonomy, distribution and evolution of golden plovers (*Pluvialis dominica* and *Pluvialis fulva*). *Auk* **100**, 607–620.

Connors PG, McCafferty BJ and Maron JL (1993). Speciation in golden plovers, *Pluvialis dominica* and *P. fulva*: evidence from the breeding grounds. *Auk* **110**, 9–20.

Cooper A, Mourer-Chauviré C, Chambers GK, von Haeseler A, Wilson AC and Pääbo S (1992). Independent origins of New Zealand moas and kiwis. *Proceedings of the National Academy of Science, USA* **89**, 8741–8744.

Cooper A, Lalueza-Fox C, Anderson S, Rambaut A, Austin J and Ward R (2001). Complete mitochondrial genome sequences of two extinct moas clarify ratite evolution. *Nature* **409**, 704–707.

Courtney J (1993). Comments on the taxonomic position of the Galah *Cacatua roseicapilla*. *Australian Bird Watcher* **15**, 60–67.

Courtney J (1996). The juvenile food-begging calls, food-swallowing vocalisation and begging postures in Australian cockatoos. *Australian Bird Watcher* **16**, 236–249.

Courtney J (1997a). The juvenile food begging calls and associated behaviour in the lorikeets. *Australian Bird Watcher* **17**, 61–70.

Courtney J (1997b). The juvenile food-begging calls and related behaviour in the Australian 'rose-tailed' parrots *Alisterus*, *Aprosmictus* and *Polytelis*; and a comparison with the Eclectus Parrot *Eclectus roratus* and Pesquet's Parrot *Psittrichas fulgidus*. *Australian Bird Watcher* **17**, 42–59.

Courtney J (1997c). The juvenile food-begging calls and associated aspects in the Australian 'broad-tailed' (platycercine) parrots. *Australian Bird Watcher* **17**, 169–184.

Courtney J (2000). Further comments on the taxonomic position of the Galah *Cacatua roseicapilla*. *Australian Bird Watcher* **18**, 241–243.

Courtney J (2002). The underwing-covert stripe as an additional character defining platycercine parrots. *Australian Bird Watcher* **19**, 194–196.

Cowan AH (1981). Size variation in the Snow Petrel (*Pagodroma nivea*). *Notornis* **26**, 169–188.

Cox JB (1973). Are the Dusky and Common Moorhens one species? *South Australian Ornithologist* **26**, 66.

Cox JB (1980). Some remarks on the breeding distribution and taxonomy of the prions (Procellariidae: *Pachyptila*). *Records of the South Australian Museum* **18**, 91–121.

Cox JB (1989). Notes on the affinities of Coopers' and Cox's Sandpipers. *South Australian Ornithologist* **30**, 169–181.

Cracraft J (1973). Continental drift, paleoclimatology, and the evolution and biogeography of birds. *Journal of Zoology* **169**, 455–545.

Cracraft J (1981). Toward a phylogenetic classification of the recent birds of the world. *Auk* **98**, 681–714.

Cracraft J (1982). Phylogenetic relationships and monophyly of loons, grebes, and hesperornithiform birds, with comments on the early history of birds. *Systematic Zoology* **31**, 35–56.

Cracraft J (1983). Species concepts and speciation analysis. *Current Ornithology* **1**, 159–187.

Cracraft J (1985). Monophyly and phylogenetic relationships of the Pelecaniformes: a numerical cladistic analysis. *Auk* **102**, 834–853.

Cracraft J (1986). The origin and early diversification of birds. *Paleobiology* **12**, 383–399.

Cracraft J (1987). DNA hybridization and avian phylogenetics. *Evolutionary Biology* **21**, 47–96.

Cracraft J (1988). The major clades of birds, In *The Phylogeny and Classification of the Tetrapods, Vol. 1: Amphibians, Reptiles, Birds* (Ed. MJ Benton) pp. 339–361. Systematics Association Special Vol. 53A. Oxford University Press, London.

Cracraft J (1992a). Review of `Sibley, C.G. & Ahlquist, J.E. Phylogeny and Classification of Birds. A Study in Molecular Evolution. 1990'. *Molecular Biology and Evolution* **9**, 182–186.

Cracraft J (1992b). The species of the birds-of-paradise (Paradisaeidae): applying the phylogenetic species concept to a complex pattern of diversification. *Cladistics* **8**, 1–43.

Cracraft J and Clarke J (2001). The basal clades of modern birds. In *New Perspectives on the Origin and Early Evolution of Birds: Proceedings of the International Symposium in Honor of John H. Ostrom* (Eds J Gauthier and LF Gall) pp. 143–156. Peabody Museum of Natural History, New Haven, Connecticut.

Cracraft J and Mindell DP (1989). The early history of modern birds: a comparison of molecular and morphological evidence. *International Congress Series* **824**, 389–403.

Cracraft J, Espinosa A, Nunn G, Helm-Bychowski,K. and Feinstein J (1998). Phylogenetic relationships and radiation of the corvine oscines. In *Proceedings of 22nd International Ornithological Congress, Durban* (Eds NJ Adams and RH Slotow) p. 398. Johannesburg, BirdLife South Africa. [Abstract]

Cracraft J, Barker FK, Braun M, Harshman J, Dyke GJ, Feinstein J, Stanley S, Cibois A, Schikler P, Beresford P, García-Moreno J, Sorenson MD, Yuki T and Mindell DP (2004). Phylogenetic relationships among modern birds (Neornithes). Towards an avian tree of life. In *Assembling the Tree of Life* (Eds J Cracraft and MJ Donoghue) pp. 468–489. Oxford University Press, New York.

Cramp S (Ed.) (1985). *Handbook of the Birds of Europe, the Middle East and North Africa: The Birds of the Western Palearctic*. Vol. 4. Oxford University Press, Oxford.

Cramp S and Simmons KEL (Eds) (1977). *Handbook of the Birds of Europe, the Middle East and North Africa: The Birds of the Western Palearctic*. Vol 1. Oxford University Press, Oxford.

Cramp S and Simmons KEL (Eds) (1983). *Handbook of the Birds of Europe, the Middle East and North Africa: The Birds of the Western Palearctic*. Vol 3. Oxford University Press, Oxford.

Crochet P-A and Desmarais E (2000). Slow rate of evolution in the mitochondrial control region of gulls (Aves: Laridae). *Molecular Biology and Evolution* **17**, 1797–1806.

Crochet P-A, Bonhomme F and Lebreton J-D (2000). Molecular phylogeny and plumage evolution in gulls (Larini). *Journal of Evolutionary Biology* **13**, 47–57.

Crowe TM, Bowie RCK, Bloomer P, Mandiwana TG, Hedderson TAJ, Randi E, Pereira SL and Wakeling J (2006). Phylogenetics, biogeography and classification of, and character evolution in, gamebirds (Aves: Galliformes): effects of character exclusion, data partitioning and missing data. *Cladistics* **22**, 495–532.

Croxall JP (1982). Sexual dimorphism in Snow Petrels *Pagodroma nivea*. *Notornis* **29**, 171–180.

Daugherty CH, Williams M and Hay JM (1999). Genetic differentiation, taxonomy and conservation of Australasian teals *Anas* spp. *Bird Conservation International* **9**, 29–42.

David N and Gosselin M (2000). The supposed significance of originally capitalized species-group names. *Bulletin of the British Ornithologists' Club* **120**, 261–266.

David N and Gosselin M (2002a). Gender agreement of avian species names. *Bulletin of the British Ornithologists' Club* **122**, 14–49.

David N and Gosselin M (2002b). The grammatical gender of avian genera. *Bulletin of the British Ornithologists' Club* **122**, 257–282.

Davies K (1992). A Molecular Assessment of the Taxonomic Status of Cox's Sandpiper (*Calidris paramelanotos*). Honours Thesis, Latrobe University, Melbourne.

Davis LS and Renner M (2003). *Penguins*. T & A D Poyser, London.

de Boer LEM and Van Brink JM (1982). Cytotaxonomy of the Ciconiiformes (Aves), with karyotypes of eight new species. *Cytogenetics and Cell Genetics* **34**, 19–34.

de Kloet RS and de Kloet SR (2005). The evolution of the spindling gene in birds: Sequence analysis of an intron of the spindlin W and Z gene reveals four major divisions of the Psittaciformes. *Molecular Phylogenetics and Evolution* **36**, 706–721.

Debus SJS (1991). Relationships of the Red Goshawk. *Australasian Raptor Association News* **12**, 46–52.

Debus SJS (1994a). Family Accipitridae [species accounts] In *Handbook of the Birds of the World*. *Vol. 2. New World Vultures to Guineafowl* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 138, 149–150, 157, 163. Lynx Edicions, Barcelona.

Debus SJS (1994b). What is the Christmas Island Goshawk? *Australian Bird Watcher* **15**, 377–379.

Debus SJS (1996). Family Turnicidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 44–59. Lynx Edicions, Barcelona.

Debus SJS, Edelstam C and Mead DA (1994). The black morph of the Chestnut-shouldered (Bürger's) Goshawk *Erythrotriorchis buergersi*. *Australian Bird Watcher* **15**, 212–217.

Degnan SM, Owens IPF, Clegg SM, Moritz CC and Kikkawa J (1999). MtDNA, microsatellites and coalescence: Tracing the colonisation of Silvereyes through the southwest Pacific. In *Proceeding of 22nd International Ornithological Congress, Durban* (Eds NJ Adams and RH Slotow) pp. 1881–1898. BirdLife South Africa, Johannesburg.

Deignan HG (1964). Subfamily Orthonychidae. In *Check-list of Birds of the World*. Vol. 10 (Eds E Mayr and RA Paynter Jr) pp. 228–240. Museum of Comparative Zoology, Cambridge, Massachusetts.

del Hoyo J, Elliot A and Sargatal J (Eds). (1992–ongoing). *Handbook of the Birds of the World*. Lynx Edicions, Barcelona. [Vol 1 –12 published thus far].

del Hoyo J, Elliot A and Sargatal J (Eds). (1992). *Handbook of the Birds of the World*. *Vol. 1. Ostrich to Ducks*. Lynx Edicions, Barcelona.

del Hoyo J, Elliot A and Sargatal J (Eds). (1994). *Handbook of the Birds of the World*. *Vol. 2. New World Vultures to Guineafowl*. Lynx Edicions, Barcelona.

del Hoyo J, Elliot A and Sargatal J (Eds). (1996). *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks*. Lynx Edicions, Barcelona.

del Hoyo J, Elliot A and Sargatal J (Eds). (1997). *Handbook of the Birds of the World. Vol. 4. Sandgrouse to Cuckoos*. Lynx Edicions, Barcelona.

del Hoyo J, Elliot A and Sargatal J (Eds). (1999). *Handbook of the Birds of the World. Vol. 5. Barn-owls to Hummingbirds*. Lynx Edicions, Barcelona.

Delacour J (1947). *The Birds of Malaysia*. Macmillan, New York.

Delacour J and Mayr E (1945). The family Anatidae. *Wilson Bulletin* **37**, 1–55.

Devillers P (1977). The skuas of the North American Pacific coast. *Auk* **94**, 417–424.

Devillers P (1978). Distribution and relationships of South American skuas. *Le Gerfaut* **68**, 374–417.

Devillers P and Terschuren JA (1978). Relationships between the blue-eyed shags of South America. *Le Gerfaut* **68**, 53–86.

Dickinson EC (Ed). (2003). *The Howard and Moore Complete Checklist of the Birds of the World*. 3rd edn. Princeton University Press, Princeton, New Jersey.

Dimcheff DE, Drovetski SV, Krishnan M and Mindell DP (2000). Cospeciation and horizontal transmission of avian sarcoma and leucosis virus *gag* genes in galliform birds. *Journal of Virology* **74**, 3984–3995.

Dimcheff DE, Drovetski SV and Mindell DP (2002). Phylogeny of Tetraoninae and other galliform birds using mitochondrial 12S and ND2 genes. *Molecular Phylogenetics and Evolution* **24**, 203–215.

Dittmann DL and Zink RM (1991). Mitochondrial DNA variation among phalaropes and allies. *Auk* **108**, 771–779.

Dittmann DL, Zink RM and Gerwin JA (1989). Evolutionary genetics of phalaropes. *Auk* **106**, 324–326.

Donne-Goussé C, Lauder V and Hanni C (2002). A molecular phylogeny of Anseriformes based on mitochondrial DNA analysis. *Molecular Phylogenetics and Evolution* **23**, 339–356.

Dooley S (2005a). Twitchers' corner. *Wingspan* **15(1)**, 35.

Dooley S (2005b). Twitchers' corner. *Wingspan* **15(2)**, 33.

Dooley S (2005c). Twitchers' corner. *Wingspan* **15(3)**, 41.

Dooley S (2005d). Twitchers' corner. *Wingspan* **15(4)**, 37.

Dooley S (2006a). Twitchers' corner. *Wingspan* **16(1)**, 35.

Dooley S (2006b). Twitchers' corner. *Wingspan* **16(2)**, 43.

Dooley S (2006c). Twitchers' corner. *Wingspan* **16(3)**, 45.

Dooley S (2006d). Twitchers' corner. *Wingspan* **16(4)**, 43.

Dooley S (2007a). Twitchers' corner. *Wingspan* **17(1)**, 59.

Dooley S (2007b). Twitchers' corner. *Wingspan* **17(2)**, 43.

Dorst J and Mougin J-L (1979). Order Pelecaniformes. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 155–193. Museum of Comparative Zoology, Cambridge, Massachusetts.

Draffan R (1978). A sight record of the Common Paradise Kingfisher, *Tanysiptera galatea*, at Darnley Island, Queensland. *Sunbird* **9**, 11.

Driskell A and Christidis L (2004). Phylogeny and evolution of the Australo-Papuan honeyeaters (Passeriformes, Meliphagidae). *Molecular Phylogenetics and Evolution* **31**, 943–960.

Dumbacher JP, Pratt TK and Fleischer RC (2003). Phylogeny of the owlet-nightjars (Aves: Aegothelidae) based on mitochondrial DNA sequence. *Molecular Phylogenetics and Evolution* **29**, 540–549.

Dumbell GS (1986). The New Zealand brown teal: 1845–1985. *Wildfowl* **37**, 71–87.

Duncan CD and Johnson PG (1977). First breeding record of White-faced Ibis for Alabama and a new area of *Plegadis* sympatry. *Alabama Birdlife* **1977**, 16.

Dunn AM (1999). Plumages, measurements and geographical variation in *Trichoglossus haematodus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird* (Ed. PJ Higgins) pp. 207–210. Oxford University Press, Melbourne.

Dwight J. (1925). The gulls (Laridae) of the world; their plumages, moults, variations, relationships, and distribution. *Bulletin of the American Museum of Natural History* **52**, 63–408.

Dyke GJ (2003). The phylogenetic position of *Gallinuloides* Eastman (Aves: Galliformes) from the Tertiary of North America. *ZooTaxa* **19**, 1–10.

Dyke GJ and Gulas BE (2002). The fossil galliform bird *Paraortygoides* from the Lower Eocene of the United Kingdom. *American Museum Novitates* **3360**, 1–14.

Dyke GJ, Gulas BE and Crowe TM (2003). Suprageneric relationships of galliform birds (Aves, Galliformes): A cladistic analysis of morphological characters. *Zoological Journal of the Linnean Society* **137**, 227–244.

Dzerzhinsky FY (1995). Evidence for common ancestry of the Galliformes and Anseriformes. *Courier Forschungsinstitut Senckenberg* **181**, 325–336.

Eades DW (1998). Twitchers' corner. *Wingspan* **18(4)**, 21.

Eberhard JR (1998). Evolution of nest-building behaviour in *Agapornis* parrots. *Auk* **115**, 455–464.

Eberhard JR, Wright TF and Bermingham E (2001). Duplication and concerted evolution of the mitochondrial control region in the parrot genus *Amazona*. *Molecular Biology and Evolution* **18**, 1330–1342.

Edge K-A (1996). Parental Investment in Penguins: A Phylogenetic and Experimental Approach. PhD Thesis. University of Otago, New Zealand.

Edwards SV (1993). Long-distance gene flow in a cooperative breeder detected in genealogies of mitochondrial DNA sequences. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **252**, 177–185.

Edwards SV and Wilson AC (1990). Phylogenetically informative length polymorphism and sequence variability in mitochondrial DNA of Australian babblers (*Pomatostomus*). *Genetics* **126**, 695–711.

Edwards SV, Fertil B, Giron A and Deschavanne PJ (2002). A genomic schism in birds revealed by phylogenetic analysis of DNA strings. *Systematic Biology* **51**, 599–613

Elliott A (1992). Family Ciconiidae. In *Handbook of the Birds of the World*. Vol. 1. Ostrich to Ducks (Eds J del Hoyo, A Elliott and J Sargatal) pp. 436–465. Lynx Edicions, Barcelona.

Ericson PGP (1996). The skeletal evidence for a sister-group relationship of anseriform and galliform birds – a critical evaluation. *Journal of Avian Biology* **27**, 195–202.

Ericson PGP (1997). Systematic relationships of the Palaeogene family Presbyornithidae (Aves: Anseriformes). *Zoological Journal of the Linnean Society* **121**, 429–483.

Ericson PGP and Johansson US (2003). Phylogeny of Passerida (Aves: Passeriformes) based on nuclear and mitochondrial sequence data. *Molecular Phylogenetics and Evolution* **29**, 126–138.

Ericson PGP, Johansson, US and Parsons, TJ (2000). Major divisions in Oscines revealed by insertions in the nuclear gene c-*myc*: a novel gene in avian phylogenetics. *Auk* **117**, 1069–1078.

Ericson PGP, Parsons TJ and Johansson US (2001). Morphological and molecular support for nonmonophyly of the Galloanserae. In *New Perspectives on the Origin and Early Evolution of Birds: Proceedings of the International Symposium in Honor of John H. Ostrom* (Eds J Gauthier and LF Gall) pp. 157–168. Peabody Museum of Natural History, New Haven, Connecticut.

Ericson PGP, Christidis L, Cooper A, Irestedt M, Jackson J, Johansson US and Norman J (2002a). A Gondwanan origin of passerine birds supported by DNA sequences of the endemic New Zealand wrens. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **269**, 235–241.

Ericson PGP, Christidis L, Irestedt M and Norman JA (2002b). Systematic affinities of the lyrebirds (Passeriformes: *Menura*), with a novel classification of the major groups of passerine birds. *Molecular Phylogenetics and Evolution* **25**, 53–62.

Ericson PGP, Envall, I, Irestedt, M and Norman, JA (2003a). Inter-familial relationships of the shorebirds (Aves: Charadriiformes) based on nuclear DNA sequence data. *BMC Evolutionary Biology* **3**. <http://www.biomedcentral.com/1471-2148/3/16> Accessed 04 March 2007.

Ericson PGP, Irestedt M and Johansson US (2003b). Evolution, biogeography, and patterns of diversification in passerine birds. *Journal of Avian Biology* **34**, 3–15.

Ericson PGP, Anderson CL, Britton T, Elzanowski A, Johansson US, Källersjö M, Ohlson, JI, Parsons TJ, Zuccon D and Mayr G (2006). Diversification of Neoaves: integration of molecular sequence data and fossils. *Biology Letters* **2**, 543–547.

Eskell R and Garnett S (1979). Notes on the colours of the legs, wings and flanks of the Dusky Moorhen *Gallinula tenebrosa*. *Emu* **79**, 143–146.

Etchécopar RD and Hüe F (1978–83). *Les Oiseaux de Chine, de Mongolie et de Corée*. Editions du Pacifique, Papeete, Tahiti.

Ewen JG, Flux I and Ericson PGP (2006). Systematic affinities of two enigmatic New Zealand passerines of high conservation priority, the hihi or stitchbird *Notiomystis cincta* and the kokako *Callaeas cinerea*. *Molecular Phylogenetics and Evolution* **40,** 281–284**.**

Fain MG and Houde P (2004). Parallel radiations in the primary clades of birds. *Evolution* **58**, 2558–2573.

Fain MG and Houde P (2007). Multilocus perspectives on the monophyly and phylogeny of the order Charadriiformes (Aves). *BMC Evolutionary Biology* **7** <http://www.biomedcentral.com/1471-2148/7/35>. Accessed 12 June 2007.

Fain MG, Krajewski C and Houde P (2007). Phylogeny of 'core Gruiformes' (Aves: Grues) and resolution of the Limpkin–Sungrebe problem. *Molecular Phylogenetics and Evolution* **43**, 515–529

Falla RA and Mougin J-L (1979). Order Sphenisciformes. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 121–134. Museum of Comparative Zoology, Cambridge, Massachusetts.

Feare C and Craig A (1999). *Starlings and Mynas*. Christopher Helm, London.

Feduccia A (1978). *Presbyornis* and the evolution of ducks and flamingos. *American Scientist* **66**, 298–304.

Fefelov I (2001). Comparative breeding ecology and hybridization of Eastern and Western Marsh Harriers *Circus spilonotus and C. aeruginosus* in the Baikal region of Eastern Siberia. *Ibis* **143**, 587–592.

Fehrer J (1996). Conflicting character distribution within different data sets on cardueline finches: artifact or history? *Molecular Biology and Evolution* **13**, 7–20.

Ferguson-Lees J, Christie DA, Franklin K, Mead D and Burton P (2001). *Raptors of the World*. Christopher Helm, London.

Fidler A., Kuhn S and Gwinner E (2004). Convergent evolution of strigiform and caprimulgiform dark-activity is supported by phylogenetic analysis using the arylalkylamine N-acetyltransferase (Aanat) gene. *Molecular Phylogenetics and Evolution* **33**, 908–921.

Filardi CE and Moyle RG (2005). Single origin of a pan-Pacific bird group and upstream colonization of Australasia. *Nature* **438**, 216–219.

Filardi CE and Smith CE (2005). Molecular phylogenetics of monarch flycatchers (genus *Monarcha*) with emphasis on Solomon endemics. *Molecular Phylogenetics and Evolution* **37**, 776–788.

Finsch O (1874). Description of a new species of penguin from New Zealand. *Proceedings of the Royal Society of London* **1874**, 207–208.

Fisher CD (1970). Geographic Variation and Evolution in the Australian Ringneck Parrots (*Barnardius*). PhD Thesis, University of Michigan.

Fjeldså J (1977). *Guide to the Young of European Precocial Birds*. Skarv Nature Publication, Tsvildeeje.

Fjeldså J (1983). Social behaviour and displays of the Hoary-headed Grebe *Poliocephalus poliocephalus*. *Emu* **83**, 129–140.

Fjeldså J (2004). *The Grebes*. Oxford University Press.

Fleming CA (1953). *Checklist of New Zealand Birds*. A H and AW Reed, Wellington.

Ford J (1970). Distribution of quail-thrushes in the Northern Territory, and their taxonomic relations. *Emu* **70**, 135–139.

Ford J (1975). Systematics and hybridization of figbirds *Sphecotheres*. *Emu* **75**, 163–171.

Ford J (1976). Systematics and speciation in the quail-thrushes of Australia and New Guinea. In *Proceedings of the 16th International Ornithological Congress* (Eds HJ Frith and JH Calaby) pp. 542–556, Australian Academy of Sciences, Canberra.

Ford J (1977). Area of origin of the Yellow Rosella. *Emu* **77**, 229–230.

Ford J (1978). Intergradation between the Varied and Mangove Honeyeaters. *Emu* **78**, 71–74.

Ford J (1979). Speciation or subspeciation in the Yellow Robins? *Emu* **79**, 103–106.

Ford J (1981a). Hybridisation and migration in Australian populations of the Little and Rufous-breasted Bronze-Cuckoos. *Emu* **81**, 209–222.

Ford J (1981b). Taxonomic status of the Spotted Catbird of Cape York Peninsula. *Sunbird* **8**, 61–64.

Ford J (1981b). Evolution, distribution and stage of speciation in the *Rhipidura fuliginosa* complex in Australia. *Emu* **81,** 128–144.

Ford J (1983a). Evolutionary and ecological relationships between quail-thrushes. *Emu* 83, 152–172.

Ford J (1983b). Speciation in the ground-thrush complex *Zoothera dauma* in Australia. *Emu* **83**, 141–151.

Ford J (1985). Species limits and phylogenetic relationships in corellas of the *Cacatua pastinator* complex. *Emu* **85**, 163–180.

Ford J (1986a). Phylogeny of the acanthizid warbler genus *Gerygone* based on numerical analyses of morphological characters. *Emu* **86**, 12–23.

Ford J (1986b). Avian hybridization and allopatry in the region of the Einasleigh Uplands and Burdekin-Lynd Divide, north-eastern Queensland. Emu **86**, 87–110.

Ford J (1987). Hybrid zones in Australian birds. *Emu* **87**, 158–178.

Ford J and Parker SA (1974). Distribution and taxonomy of some birds from south-western Queensland. *Emu* **74**, 177–194.

Ford NL (1967). A Systematic Study of the Owls Based on Comparative Osteology. PhD Thesis, University of Michigan, Ann Arbor, Michigan.

Forshaw JM (1969). *Australian Parrots*. Lansdowne Press, Melbourne.

Forshaw JM (1973). *Parrots of the World*. Lansdowne Editions, Melbourne.

Forshaw JM (1978). *Parrots of the World*. 2nd rev. edn. Lansdowne Editions, Melbourne.

Forshaw JM (1981). *Australian Parrots*. 2nd rev. edn. Lansdowne Editions, Melbourne.

Forshaw JM (1987). *Kingfishers and Related Birds. Vol. 2. Alcedinidae: Halcyon* to *Tanysiptera*. Lansdowne, Sydney.

Forshaw JM (2002). *Australian Parrots*. 3rd rev. edn. Alexander Editions, Robina, Queensland.

Fraser G (2004). First records of the Common Chaffinch *Fringilla coelebs* and European Goldfinch *Carduelis chloris* from Lord Howe Island. *Australian Field Ornithology* **21**, 83–85.

Friedmann H (1968). The evolutionary history of the avian genus *Chrysococcyx*. *United States National Museum Bulletin* **265**, 1–137.

Friesen VL and Anderson DJ (1997). Phylogeny and evolution of the Sulidae (Aves: Pelecaniformes): a test of alternative modes of speciation. *Molecular Phylogenetics and Evolution* **7**, 252–260.

Frith CB and Beehler BM (1998). *The Birds of Paradise: Paradisaeidae*. Oxford University Press, Oxford.

Frith CB and Frith DW (2004). *The Bowerbirds Ptilonorhynchidae*. Oxford University Press, Oxford.

Frith HJ (1964). Taxonomic status of *Stictonetta naevosa* (Gould). *Nature* **202**, 1352–1353.

Frith HJ (1967). *Waterfowl in Australia*. Angus and Robertson, Sydney.

Frith HJ (1982). *Pigeons and Doves of Australia*. Rigby, Adelaide.

Frith HJ and McKean JL (1975). Races of the introduced Spotted Turtledove, *Streptopelia chinensis* (Scopoli), in Australia. *Australian Journal of Zoology* **23**, 295–306.

Fry CH (1980). The evolutionary biology of kingfishers (Alcedinidae). *Living Bird* **18**, 113–160.

Fry CH and Keith S (2004). *The Birds of Africa*. Vol. 7. Christopher Helm, London.

Fry CH, Fry K and Harris A (1992). *Kingfishers, Bee-eaters and Rollers*. Croom Helm, London.

Fullagar PJ, Disney HJ de S and De Naurois R (1982). Additional specimens of two rare rails and comments on the genus *Tricholimnas* of New Caledonia and Lord Howe Island. *Emu* **82**, 131–136.

Fullagar PJ, Davey CC and Rushton DK (1990). Social behaviour of the Freckled Duck *Stictonetta naevosa* with particular reference to the Axleground. *Wildfowl* **41**, 53–61.

Fumihito A, Miyake T, Takada M, Ohno S and Kondo N (1995). The genetic link between the Chinese bamboo partridge (*Bambusicola thoracica*) and the chicken and junglefowls of the genus *Gallus*. *Proceedings of the National Academy of Sciences, USA* **92**, 11053–11056.

Furness RW (1987). *The Skuas*. T. and A.D. Poyser, Calton, UK.

Furness RW (1996). Family Stercorariidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 556–571. Lynx Edicions, Barcelona.

Gadow H (1884). *Catalogue of the Passeriformes, or Perching Birds, in the Collection of the British Museum. Vol. 9. Cinnyrimorphae: containing the families Nectariniidae and Meliphagidae* (*Sun-birds and Honey-eaters*). Trustees of the British Museum, London.

Galbraith ICJ (1956). Variation, relationships and evolution in the *Pachycephala pectoralis* superspecies (Aves: Muscicapidae). *Bulletin of the British Museum of Natural History* **4**, 131–222.

Gales R (1993). *Co-operative Mechanisms for the Conservation of Albatrosses*. Government Printer, Hobart.

García-Moreno JM and Mindell DP (2000). Rooting a phylogeny with homologous genes on opposite sex chromosomes (gametologs): A case study using avian CHD. *Molecular Biology and Evolution* **17**, 1826–1832.

García-Moreno JM, Sorenson MD and Mindell DP (2003). Congruent avian phylogenies inferred from mitochondrial and nuclear DNA sequences. *Journal of Molecular Evolution* **57**, 27–37.

Garnett S and Smith R (1997). A second record of a Papuan species of paradise-kingfisher in Torres Strait and its relevance to the dissemination of Japanese Encephalitis. *Sunbird* **27**, 83–84.

Garnett ST (Ed.). (1992). Threatened and Extinct Birds of Australia. *RAOU Report* **82**. Royal Australasian Ornithologists Union and Australian National Parks and Wildlife Service, Canberra.

Garnett ST and Crowley GM (2000). *The Action Plan for Australian Birds 2000*. Environment Australia, Canberra.

Garnett ST, Crowley GM and Stattersfield AJ (2003). Changes in the conservation status of Australian birds resulting from differences in taxonomy, knowledge and the definitions of threat. *Biological Conservation* **113**, 269–276.

Giannini NP and Bertelli S 2004. Phylogeny of extant penguins based on integumentary and breeding characters. *Auk* **121**, 422–434.

Gibbs D, Barnes E and Cox J (2001). *Pigeons and Doves. A Guide to the Pigeons and Doves of the World*. Pica Press, Sussex.

Gibson-Hill CA (1947). Notes on the birds of Christmas Island. *Bulletin of the Raffles Museum* **18**, 87–165.

Gibson-Hill CA (1949). The birds of the Cocos-Keeling Islands (Indian Ocean). *Ibis* **91**, 221–243.

Gill BJ (1983). Morphology and migration of *Chrysococcyx lucidus*, an Australasian cuckoo. *New Zealand Journal of Zoology* **10**, 371–382.

Given AD, Mills JA and Baker AJ (2005). Molecular evidence for recent radiation in Southern Hemisphere masked gulls. *Auk* **122**, 268–279.

Gochfeld M and Burger J (1996). Family Sternidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 624–667. Lynx Edicions, Barcelona.

Goodwin D (1967a). *Pigeons and Doves of the World*. British Museum (Natural History), London.

Goodwin D (1967b). Australian pigeons: their affinities and status. *Emu* **66**, 319–336.

Goodwin D (1983). *Pigeons and Doves of the World*. 3rd edn. Cornell University Press, Ithaca, New York.

Gould J (1838). *A Synopsis of the Birds of Australia and the Adjacent Islands*. Part 4. J Gould, London.

Gould J (1840). *The Birds of Australia*. Vol. 2 (Part 1). J.Gould, London.

Gould J (1842). [Untitled.] *Proceedings of the Zoological Society of London* **1842**, 72.

Gould J (1843). Descriptions of thirty new species of birds from Australia. *Proceedings of the Zoological Society of London* **1842**, 131–140.

Gould J (1845). *The Birds of Australia* Vol. 6 (Part 21). Published by the author, London.

Gould J (1848). *An Introduction to the Birds of Australia*. Published by the author, London.

Gould S and Barnett M (2005). First breeding record of the Spotted Whistling-Duck *Dendrocygna guttata* in Australia. *Australian Field Ornithology* **22**, 196–200.

Greenway JC Jr. (1967). *Extinct and Vanishing Birds of the World*. 2nd edn. Dover, New York.

Griffiths CS (1994). Monophyly of the Falconiformes based on syringeal morphology. *Auk* **111**, 787–805.

Griffiths CS (1997). Correlation of functional domains and rates of nucleotide substitution in cytochrome *b*. *Molecular Phylogenetics and Evolution* **7**, 352–365.

Griffiths CS (1999). Phylogeny of the Falconidae inferred from molecular and morphological data. *Auk* **116**, 116–130.

Groth JG (1998). Molecular phylogenetics of finches and sparrows: consequences of character state removal in cytochrome b sequences. *Molecular Phylogenetics and Evolution* **10**, 377–390.

Groth JG and Barrowclough GF (1999). Basal divergences in birds and the phylogenetic utility of the nuclear RAG-1 gene. *Molecular Phylogenetics and Evolution* **12**, 115–123.

Gutiérrez RJ, Zink RM and Yang SF (1983). Genic variation, systematic, and biogeographic relationships of some galliform birds. *Auk* **100**, 33–49.

Güttinger HR (1978). Verwandtschaftsbeziehungen und Gesangsaufbau bei Stieglitz (*Carduelis carduelis*) und Grünlingsverwandten (*Chloris* spec.). *Journal für Ornithologie* **119**, 172–190.

Hackett SJ (1989). Effects of varied electrophoretic conditions detection of evolutionary patterns in the Laridae. *Condor* **91**, 73–90.

Hadden D (2006). Cocos (Keeling) Island birds. *Wingspan* **16(4)**, 34–37.

Haddrath O and Baker AJ (2001). Complete mitochondrial DNA genome sequences of extinct birds: ratite phylogenetics and the vicariance biogeography hypothesis. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **268**, 939–945.

Haffer J (1992). The history of species concepts and species limits in ornithology. *Bulletin of the British Ornithologists' Club*, **Centenary Supplement 112A**, 39–52.

Haftorn S, Mehlum F, and Bech C (1988). Size variation in the Snow Petrel *Pagodroma nivea*. *Notornis* **35**, 109–116.

Hahn S, Ritz MS and Peter, H-U (2003). Living in mixed pairs – better for fitness? A study in skuas. In *Antarctic Biology in a Global Context. Proceedings of the VIIIth SCAR International Biology Symposium.* (Eds AHL Huiskes, WWC Gieskes, J Rozema, RML Schorno, SM van der Vies and WJ Wolff) pp. 229–233. Backhuys Publishers, Leiden, The Netherlands.

Hancock J (1984). Aerial stretch display of the eastern race of the Great White Egret *Egretta alba*. *Ibis* **126**, 92–94.

Hancock J and Elliott H (1978). *Herons of the World*. Harper and Row, New York.

Hancock J and Kushlan J (1984). *The Herons Handbook*. Croom Helm, London.

Hancock JA, Kushlan JA and Kahl MP (1992). *Storks, Ibis and Spoonbills of the World*. Academic Press, London.

Hardy JW, Coffey BB Jr and Reynard GB (1989). *Voices of the New World Owls*. ARA Records, Gainesville, Florida.

Haring E, Kruckenhauser L, Gamauf A, Riesing MJ and Pinsker W (2001). The complete sequence of the mitochondrial genome of *Buteo bute*o (Aves, Accipitridae) indicates an early split in the phylogeny of raptors. *Molecular Biology and Evolution* **18**, 1892–1904.

Hårlid A, Janke A and Arnason U (1997). The mtDNA sequence of the ostrich and the divergence between paleognathous and neognathous birds. *Molecular Biology and Evolution* **14**, 754–761.

Hårlid A, Janke A and Arnason U (1998). The complete mitochondrial genome of *Rhea americana* and early avian divergences. *Journal of Molecular Evolution* **46**, 669–679.

Harper PC (1978). The plasma proteins of some albatrosses and petrels as an index of relationship in the Procellariiformes. *New Zealand Journal of Zoology* **5**, 509–548.

Harper PC (1980). The field identification and distribution of prions (genus *Pachyptila*), with particular reference to the identification of storm-cast material. *Notornis* **27**, 235–286.

Harrison CJO (1969). Some comparative notes on the Peaceful and Zebra Doves (*Geopelia striata* ssp.) with reference to their taxonomic status. *Emu* **69**, 66–71.

Harrison CJO (1978). Osteological differences in the leg bones of two forms of *Anhinga*. *Emu* **78**, 230–231.

Harrison P (1985). *Seabirds: An Identification Guide*. Rev. edn. Croom Helm, London.

Harshman J (1994). Reweaving the Tapestry: what can we learn from Sibley and Ahlquist (1990)? *Auk* **111**, 377–388.

Harshman J (1996). Phylogeny, Evolutionary Rates, and Ducks. PhD thesis, University of Chicago.

Hartert E (1903). On the birds of the Key and South-East Islands, and of Ceram-Laut. *Novitates Zoologicae* **10**, 232–254.

Hartert E (1925). Review of the genus *Cacomantis* Müll. *Novitates Zoologicae* **32**, 164–174.

Hartert E and Stresemann E (1925). Ueber die indoaustralischen Glanzkuckucke (*Chalcites*). *Novitates Zoologicae* **32**, 158–163.

Harvey NG (1999). A Hierarchical Genetic Analysis of Swan Relationships. PhD thesis, University of Nottingham, UK.

Hassell C, Boyle AM, Blunt D and O'Connor F (2003). Blue-and-white Flycatcher *Cyanoptila cyanomelana*: First live record for Australia. *Australian Field Ornithology* **20**, 113–116.

Hassell CJ (1998). Arctic Warbler: first confirmed record for mainland Australia. *Australian Bird Watcher* **17**, 365–369.

Hawkins J (1988). The Farewell Spit gannetry – A new sea level colony. *Notornis* **35**, 249–260.

Hay JR (1985). An oystercatcher in Vanuatu. *Notornis* **32**, 79–80.

Hayes FE (2002). Geographic variation, taxonomy and identification of New World *Butorides* herons. *North American Birds* **56**, 4–10.

Hayman P, Marchant J and Prater T (1986). *Shorebirds: An Identification Guide to the Waders of the World*. Croom Helm, London.

Hazevoet CJ (1995). *The Birds of the Cape Verde Islands*. BOU Check-list No. 13. British Ornithologists' Union, Tring.

Hedges SB and Sibley CG (1994). Molecules vs. morphology in avian evolution: The case of the 'pelecaniform' birds. *Proceedings of the National Academy of Sciences, USA* **91**, 9861–9865.

Hedges SB, Simmons MD, Van Dijk MAM, Caspers G-J, De Jong WW and Sibley CG (1995). Phylogenetic relationships of the Hoatzin, an enigmatic South American bird. *Proceedings of the National Academy of Science, USA* **92**, 11662–11665.

Heidrich P, Ristow D and Wink M (1996). Differenzierung von Gelb- und Schwarzschnabelsturmtauche rn (*Calonectris diomedea*, *Puffinus puffinus*, *P. yelkouan*) und Großmöwen des Silbermöwenkomplexes (*Larus argentatus*, *L. fuscus*, *L. cachinnans*). *Journal für Ornithologie* **137**, 281–294.

Heidrich P, Amengual J and Wink M (1998). Phylogenetic relationships in Mediterranean and North Atlantic shearwaters (Aves: Procellariidae) based on nucleotide sequences of mtDNA. *Biochemical Systematics and Ecology* **26**, 145–170.

Heidrich P, Amengual J, Ristow D and Wink M (2000). Phylogenetic relationships among Procellariiformes based on nucleotide sequences, with special reference of the Mediterranean and North Atlantic shearwaters. In *Monitoring and Conservation of Birds, Mammals and Sea Turtles of he Mediterranean and Black Seas* (Eds P Yèsou and J Sultana) pp. 159–175. Birdlife, Malta.

Helbig AJ and Seibold I (1999). Molecular phylogeny of Palearctic-African *Acrocephalus* and *Hippolais* warblers (Aves: Sylviidae). *Molecular Phylogenetics and Evolution* **11**, 246–260.

Helbig AJ, Knox AK, Parkin DT, Sangster G and Collinson M (2002). Guidelines for assigning species rank. *Ibis* **144**, 518–525.

Helm-Bychowski KM and Wilson AC (1986). Rates of nuclear DNA evolution in pheasant-like birds: evidence from restriction maps. *Proceedings of the National Academy of Sciences, USA* **83**, 688–692.

Hermes N, Evans O and Evans B (1986). Norfolk Island birds: a review 1985. *Notornis* **33**, 141–149.

Higgins PJ (Ed.) (1999). *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* Oxford University Press, Melbourne.

Hindwood KA (1940). The birds of Lord Howe Island. *Emu* **40**, 1–86.

Hindwood KA (1964). George Raper: an artist of the First Fleet. *Journal and Proceedings of the Royal Australian History Society* **50**, 32–57.

Hindwood KA (1969). Letter to the editor. *Notornis* **16**, 64–65.

Ho CY-K, Prager EM, Wilson AC, Osuga DT and Feeney RE (1976). Penguin protein evolution: protein comparisons demonstrate phylogenetic relationship to flying aquatic birds. *Journal of Molecular Evolution* **8**, 271–282.

Hobcroft D (2000). Ashmore Reef pelagic trip October to November 1999. *Australasian Seabird Bulletin* **36**, 17–19.

Hockey PAR (1996). Family Haematopodidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 308–325. Lynx Edicions, Barcelona.

Hoerschelmann H and Jacob J (1992). Ein Beitrag zur Chemotaxonomie der Wat-, Möwen- und Alkenvögel (Aves: Charadriiformes). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut* **89**, 319–350.

Höfling E and Alvarenga HMF (2001). Osteology of the shoulder girdle in the Piciformes, Passeriformes and related groups of birds. *Zoologischer Anzeiger* **240**, 196–208.

Holdaway RN and Anderson A (2001). Avifauna from the Emily Bay Settlement Site, Norfolk, Island: a preliminary account. *Records of the Australian Museum Supplement* **27**, 85–100.

Holdaway RN, Worthy TH and Tennyson AJD (2001). A working list of breeding bird species of the New Zealand region at first human contact. *New Zealand Journal of Zoology* **28**, 119–187.

Holman JA (1964). Osteology of gallinaceous birds. *Quarterly Journal of the Florida Academy of Sciences* **27**, 230–252.

Holmes G (1999). Evidence for two species of Cicadabirds in north Queensland. *Bird Observer* **801**, 12.

Holmgren J (1998). A parsimonious phylogenetic tree for the swifts, Apodi, compared with DNA-analysis phylogenies. *Bulletin of the British Ornithologists' Club* **118**, 238–249.

Holyoak D (1970a). Comments on the classification of the Old World ibises. *Bulletin of the British Ornithologists' Club* **90**, 67–73.

Holyoak DT (1970b). Structural characters for supporting the recognition of the genus *Eolophus* for *Cacatua roseicapilla*. *Emu* **70**, 200.

Holyoak DT (1970c). The relation of the parrot genus *Opopsitta* to *Psittaculirostris*. *Emu* **70**, 198.

Holyoak DT (1999). Family Podargidae. In *Handbook of the Birds of the World. Vol. 5. Barn-owls to Hummingbirds* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 266–287. Lynx Edicions, Barcelona.

Holyoak DT (2001). *Nightjars and their Allies*. Oxford University Press Oxford.

Holyoak DT and Thibault, J-C (1976). La variation geographique de *Gygis alba*. *Alauda* **44**, 457–473.

Homberger DG (1980). Funktionell-morphologische Untersuchungen zur Radiation der Ernährungs- und Trinkmethoden der Papageien (Psittaci). *Bonner Zoologische Monographien* **13**, 1–192.

Homberger DG (2003). The comparative biomechanics of a prey-predator relationship: The adaptive morphologies of the feeding apparatus of the Australian Black-Cockatoos and their foods as a basis for the reconstruction of the evolutionary history of the Psittaciformes. In *Vertebrate Biomechanics and Evolution* (Eds VL Bels, J-P Gasc and A Casinos) pp. 203–228. BIOS Scientific Publishers, Oxford.

Hopton D (2006). Birds of the Cocos (Keeling) Islands, Indian Ocean. *Western Australian Naturalist* **25**, 72–91.

Hoskin ES (1991). *The Birds of Sydney*. 2nd edn. Surrey Beatty & Sons, Chipping Norton, UK.

Houde P (1987). Critical evaluation of DNA hybridization studies in avian systematics. *Auk* **104**, 17–32.

Houde P, Cooper A, Leslie E, Strand AE and Monta o GA. (1997). Phylogeny and evolution of 12S rDNA in Gruiformes (Aves). In *Avian Molecular Evolution and Systematics* (Ed. DP Mindell) pp. 121–158. Academic Press, San Diego, California.

Hughes JM (1996). Phylogenetic analysis of the Cuculidae (Aves, Cuculiformes) using behavioural and ecological characters. *Auk* **113**, 10–22.

Hughes JM (2000). Monophyly and phylogeny of cuckoos (Aves, Cuculidae) inferred from osteological characters. *Zoological Journal of the Linnean Society* **130**, 263–307.

Hughes JM and Baker AJ (1999). Phylogenetic relationships of the enigmatic Hoatzin (*Opisthocomus hoazin*) resolved using mitochondrial and nuclear gene sequences. *Molecular Biology and Evolution* **16**, 1300–1307.

Hume RA (1996). Family Burhinidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Ed. J del Hoyo, A Elliot and J Sargatal) pp. 348–363. Lynx Edicions, Barcelona.

Hunter S (1982). Interspecific breeding in giant petrels at South Georgia. *Emu* **82 Supplement**, 312–314.

ICZN (International Commission on Zoological Nomenclature). (1976). Opinion 1056. *Eudyptes atratus* Finsch, 1875 ex Hutton M.S. (Aves): suppressed under the plenary powers. *Bulletin of Zoological Nomenclature* **33**, 16–17.

ICZN (1987). *Official Lists and Indexes of Names and Works in Zoology* (Eds RV Melville and JDD Smith). International Trust for Zoological Nomenclature, London.

ICZN (1992). Opinion 1674. Threskiornithidae Poche, 1904 (Aves, Ciconiiformes): given precedence over Plataleidae Bonaparte, 1838 and Eudocimidae Bonaparte, 1854. *Bulletin of Zoological Nomenclature* **49**, 97–99.

ICZN (1999). *International Code of Zoological Nomenclature*, 4th edn. International Trust for Zoological Nomenclature, London.

ICZN (2003). Opinion 2026 (Case 3044) Generic and specific names of birds (Aves) conventionally accepted as published in the *Proceedings of the Zoological Society of London* and monographic works by John Gould and other contemporary zoologists: suppression of all prior usages not approved. *Bulletin of Zoological Nomenclature* **60**, 79–80.

Imber MJ (1984). Migration of White-faced Storm-Petrels *Pelagodroma marina* in the South Pacific and the status of the Kermadec subspecies. *Emu* **84**, 32–35.

Imber MJ (1985). Origins, phylogeny and taxonomy of the gadfly petrels *Pterodroma* spp. *Ibis* **127**, 197–229.

Imber MJ and Tennyson AJD (2001). A new petrel species (Procellariidae) from the south-west Pacific. *Emu* **101**, 123–127.

Inskipp T, Lindsey N and Duckworth W (1996). *An Annotated Checklist of the Birds of The Oriental Region*. Oriental Bird Club, Sandy, UK.

Irestedt M, Johansson US, Parsons TJ and Ericson PGP (2001). Phylogeny of major lineages of suboscines (Passeriformes) analysed by nuclear DNA sequence data. *Journal of Avian Biology* **32**, 15–25.

Irwin MPS 1999. The genus *Nectarinia* and the evolution and diversification of sunbirds: an Afrotropical perspective. *Honeyguide* **45**, 45–58.

Isaac NJB, Mallet J and Mace GM (2004). Taxonomic inflation: its influence on macroecology and conservation. *Trends in Ecology & Evolution* **19**, 464–469.

Izzard J and Watson WD (1980). A sight record of the Herald Petrel off northern New South Wales. *Australian Birds* **5**, 5–6.

Jacob J and Hoerschelmann H (1985). Klassifizierung der Flamingos (Phoenicopteriformes) durch vergleichende Analyse von Bürzeldrünsensekreten. *Zeitschrift für Zoologische Systematik und Evolutionforshung* **23**, 49–58.

James DJ (1993a). Plumages of *Coturnix novaezelandiae*. In *Handbook of Australian, New Zealand and Antarctic Birds*, *Vol. 2. Raptors to Lapwings* (Eds S Marchant and PJ Higgins) pp. 402–403. Oxford University Press, Melbourne.

James DJ (1993b). Geographical variation in *Gallinula tenebrosa*. In *Handbook of Australian, New Zealand and Antarctic Birds*, *Vol. 2. Raptors to Lapwings* (Eds S Marchant and PJ Higgins) p. 608. Oxford University Press, Melbourne.

James DJ (1996). Plumages of *Hemiphaga novaeseelandiae*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 3. Snipe to Pigeons* (Eds PJ Higgins and SJJF Davies) pp. 1022–1025. Oxford University Press, Melbourne.

James DJ and Eades DW (1996). Geographical variation in *Larus novaehollandiae*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 3. Snipe to Pigeons* (Eds PJ Higgins and SJJF Davies) p. 542. Oxford University Press, Melbourne.

James DJ and Scofield RP (1996). Geographical variation in *Procelsterna cerulea*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 3. Snipe to Pigeons* (Eds PJ Higgins and SJJF Davies) p. 824. Oxford University Press, Melbourne.

Jehl JR Jr (1968a). Relationships of the Charadrii (shorebirds): a taxonomic study based on the color patterns of the downy young. *San Diego Natural History Museum Memoir* **3**, 1–54.

Jehl JR Jr (1968b). The systematic position of the Surfbird, *Aphriza virgata*. *Condor* **70**, 206–210.

Jehl JR Jr (1975). *Pluvianellus socialis*: biology, ecology, and relationships of an enigmatic shorebird. *Transactions of the San Diego Society of Natural History* **18**, 25–74.

Jehl JR Jr (1982). The biology and taxonomy of Townsend's Shearwater. *Le Gerfaut* **72**, 121–135.

Jenni DA (1996). Family Jacanidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 276–291. Lynx Edicions, Barcelona.

Johansson US, Parsons TJ, Irestedt M and Ericson PGP (2001). Clades within the 'higher land birds', evaluated by nuclear DNA sequences. *Journal of Zoological Systematics and Evolutionary Research* **39**, 37–51.

Johnsgard PA (1961). Tracheal anatomy of the Anatidae and its taxonomic significance. *Wildfowl* **12**, 58–69.

Johnsgard PA (1968). *Waterfowl: Their Biology and Natural History*. University of Nebraska Press, Lincoln.

Johnsgard PA (1970). A summary of intergeneric New World quail hybrids, and a new intergeneric combination. *Condor* **72**, 85–88.

Johnsgard PA (1973). *Grouse and Quails of North America*. University of Nebraska Press, Lincoln.

Johnsgard PA (1978). *Ducks, Geese and Swans of the World*. University of Nebraska Press, Lincoln.

Johnsgard PA (1981). *The Plovers, Sandpipers, and Snipes of the World*. University of Nebraska Press, Lincoln.

Johnsgard PA (1988). *The Quails, Partridges, and Francolins of the World*. Oxford University Press, Oxford.

Johnsgard PA (1991). *Bustards, Hemipodes, and Sandgrouse: Birds of Dry Places*. Oxford University Press, Oxford.

Johnsgard PA (1993). *Cormorants, Darters, and Pelicans of the World*. Smithsonian Institution Press, Washington, DC.

Johnson KP and Clayton DH (2000). Nuclear and mitochondrial genes contain similar phylogenetic signal for pigeons and doves (Aves: Columbiformes). *Molecular Phylogenetics and Evolution* **14**, 141–151.

Johnson KP and Sorenson MD (1998). Comparing molecular evolution in two mitochondrial protein coding genes (Cytochrome *b* and ND2) in the dabbling ducks (Tribe: Anatini). *Molecular Phylogenetics and Evolution* **10**, 82–94.

Johnson KP and Sorenson MD (1999). Phylogeny and biogeography of dabbling ducks (Genus: *Anas*): a comparison of molecular and morphological evidence. *Auk* **116**, 792–805.

Johnson KP, Goodman, SM and Lanyon SM (2000). A phylogenetic study of the Malagasy couas with insights into cuckoo relationships. *Molecular Phylogenetics and Evolution* **14**, 436–444.

Johnson KP, De Kort S, Dinwoodey K, Mateman AC, Ten Cate C, Lessells CM and Clayton DH (2001). A molecular phylogeny of the dove genera *Streptopelia* and *Columba*. *Auk* **118**, 884–887.

Johnstone GW (1978). Interbreeding by *Macronectes halli* and *M. giganteus* at Macquarie Island. *Emu* **78**, 235.

Johnstone RE (1981a). Notes on the distribution, ecology and taxonomy of the Partridge Pigeon (*Geophaps smithii*) and Spinifex Pigeon (*Geophaps plumifera*) in Western Australia. *Records of the Western Australian Museum* **9**, 49–64.

Johnstone RE (1981b). Notes on the distribution, ecology and taxonomy of the Red-crowned Pigeon (*Ptilinopus regina*) and the Torres Strait Pigeon (*Ducula bicolor*) in Western Australia. *Records of the Western Australian Museum* **9**, 7–22.

Johnstone RE (1982). Distribution, status and variation of the Silver Gull *Larus novaehollandiae* Stephens, with notes on the *Larus cirrocephalus* species-group. *Records of the Western Australian Museum* **10**, 133–165.

Johnstone RE (1984). Intergradation between Lemon-breasted Flycatcher *Microeca flavigaster* Gould and Brown-tailed Flycatcher *Microeca tormenti* Mathews in Cambridge Gulf, Western Australia. *Records of the Western Australian Museum* **11**, 291–295.

Johnstone RE (1990). Mangroves and mangrove birds of Western Australia. *Records of the Western Australian Museum Supplement* **32**, 1–120.

Johnstone RE (1992). Notes on the distribution, ecology and taxonomy of the Peaceful Dove *Geopelia striata* in Western Australia. *West Australian Naturalist* **19**, 10–17.

Johnstone RE (2001). Checklist of the birds of Western Australia. *Western Australian Museum Supplement* **63**, 75–90.

Johnstone RE and Darnell JC (1996) A Blue-and-white Flycatcher (*Ficedula cyanomelana*), a new bird for Australia. *Western Australian Naturalist* **21**, 43–48.

Johnstone RE and Darnell JC (1997). Description of a new subspecies of Boobook Owl *Ninox novaeseelandiae* (Gmelin) from Roti Island, Indonesia. *Western Australian Naturalist* **21**, 161–173.

Johnstone RE and Darnell JC (2004a). Appendix A. Annotated checklist of Christmas Island birds. In *Handbook of Western Australian Birds. Vol. II. Passerines* (*Blue-winged Pitta to Goldfinch*). (RE Johnstone RE and GM Storr). pp. 439–476. Western Australian Museum, Perth.

Johnstone RE and Darnell JC (2004b). Appendix B. Annotated checklist of birds from Cocos-Keeling Islands. In *Handbook of Western Australian Birds. Vol. II. Passerines* (*Blue-winged Pitta to Goldfinch*). (RE Johnstone RE and GM Storr). pp. 477–499. Western Australian Museum, Perth.

Johnstone RE and Darnell JC (2004c). Appendix C. In *Handbook of Western Australian Birds. Vol. II. Passerines* (*Blue-winged Pitta to Goldfinch*). (RE Johnstone RE and GM Storr). pp. 497–499. Western Australian Museum, Perth.

Johnstone RE and Irvine LG (2004). Description of an immature male Kerguelen Pintail *Anas eatoni* collected at Mawson Station, Eastern Antarctica. *Western Australian Naturalist* **24**, 164–168.

Johnstone RE and Storr GM (1998). *Handbook of Western Australian Birds. Vol. I. Non-passerines* (*Emu to Dollarbird*). Western Australian Museum, Perth.

Johnstone RE and Storr GM (2004). *Handbook of Western Australian Birds. Vol. II. Passerines* (*Blue-winged Pitta to Goldfinch*). Western Australian Museum, Perth.

Jones DA and Gibbs HL (1997). Intra- and interspecific sequence variation in a portion of the mitochondrial ND6 gene in cuckoos. *Condor* **99**, 815–818.

Jones DN, Dekker RWRJ and Roselaar CS (1995). *The Megapodes*. Oxford University Press, Oxford.

Jønsson KA and Fjeldså J (2006). A phylogenetic supertree of oscine passerine birds (Aves: Passeri). *Zoologica Scripta* **35**, 149–186.

Jønsson, K.A., Fjeldså, J, Ericson, P.G.P. and Irestedt, M. (2007). Systematic placement of an enigmatic Southeast Asian taxon *Eupetes macrocercus* and implications for the biogeography of a main songbird radiation, the Passerida. *Biology Letters* **3**, 323–326.

Joseph L and Hope R (1984). Aspects of genetic relationships and variation in parrots of the Crimson Rosella *Platycercus elegans* complex (Aves: Psittacidae). *Transactions of the Royal Society of South Australia* **108**, 77–84.

Joseph L and Moritz C (1993a). Phylogeny and historical aspects of the ecology of eastern Australian scrubwrens: evidence from mitochondrial DNA. *Molecular Ecology* **2**, 161–170.

Joseph L and Moritz C (1993b). Hybridisation between the White-browed and Atherton Scrubwrens: detection with mitochondrial DNA. *Emu* **93**, 93–99.

Joseph L and Wilke T (2006). Molecular resolution of population history, systematics and historical biogeography of the Australian ringneck parrots *Barnardius*: are we there yet? *Emu* **106**, 49–62.

Joseph L, Moritz C and Hugall A (1993). A mitochondrial DNA perspective on the historical biogeography of mideastern Queensland rainforest birds. *Memoirs of the Queensland Museum* **34**, 201–214.

Joseph L, Lessa EP and Christidis L (1999). Phylogeny and biogeography in the evolution of migration: shorebirds of the *Charadrius* complex. *Journal of Biogeography* **26**, 329–342.

Joseph L, Slikas B, Alpers D and Schodde R (2001). Molecular systematics and phylogeography of New Guinean logrunners (Orthonychidae). *Emu* **101**, 273–280.

Joseph L, Wilke T and Alpers D (2002). Reconciling genetic expectations from host specificity with historical population dynamics in an avian brood parasite, Horsfield's Bronze-Cuckoo *Chalcites basalis* of Australia. *Molecular Ecology* **11**, 829–837

Joseph L, Wilke T, Ten Have J and Chesser RT (2006). Implications of mitochondrial DNA polyphyly in two ecologically undifferentiated but morphologically distinct migratory birds, the Masked and White-browed Woodswallows *Artamus* spp. of inland Australia. *Journal of Avian Biology* **37**, 625–636.

Jouanin C and Mougin J-L (1979). Order Procellariiformes. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 48–121. Museum of Comparative Zoology, Cambridge, Massachusetts.

Jouventin P (1982). Visual and vocal signals in penguins. Their evolution and adaptive characters. *Advances in Ethology* **24**, 1–149.

Jouventin P and Bried J (2001). The effect of mate choice on speciation in snow petrels. *Animal Behaviour* **62**, 123–132.

Jouventin P and Viot C-R (1985). Morphological and genetic variability of Snow Petrels *Pagodroma nivea*. *Ibis* **127**, 430–441.

Jouventin P, Cuthbert RJ and Ottvall R (2006). Genetic isolation and divergence in sexual traits: evidence for the northern rockhopper penguin *Eudyptes moseleyi* being a sibling species. *Molecular Ecology* **15**, 3413–3423.

Juniper T and Parr M (1998). *Parrots. A Guide to the Parrots of the World*. Pica Press, Sussex.

Kahl MP (1972). A revision of the family Ciconiidae (Aves). *Journal of Zoology* **187**, 451–461.

Kahl MP (1979a). Order Phoenicopteriformes. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 269–271. Museum of Comparative Zoology, Cambridge, Massachusetts.

Kahl MP (1979b). Family Ciconiidae. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 245–252. Museum of Comparative Zoology, Cambridge, Massachusetts.

Kahl MP and Schüz E (1972). Zur Benennung und zur taxonomischen Gruppierung der 17 Arten Störche (Ciconiidae). *Vogelwarte* **26**, 277–280.

Karkhu AA (1992). Morphological divergence within the order Apodiformes as revealed by the structure of the humerus. *Natural History Museum of Los Angeles County Science Series* **36**, 379–384.

Kear J (Ed.) (2005). *Bird Families of the World: Ducks, Geese, and Swans*. Oxford University Press, Oxford.

Keast A (1961). Bird speciation on the Australian continent. *Bulletin of the Museum of Comparative Zoology* **123**, 305–495.

Kennedy M and Spencer HG (2000). Phylogeny, biogeography, and taxonomy of Australasian teals. *Auk* **117**, 154–163.

Kennedy M and Spencer HG (2003). Phylogenies of the frigatebirds (Fregatidae) and tropicbirds (Phaethonidae), two divergent groups of the traditional order Pelecaniformes, inferred from mitochondrial DNA sequences. *Molecular Phylogenetics and Evolution* **31**, 31–38.

Kennedy M, Spencer HG and Gray RD (1993). A yellow-footed pink-footed shag: an unusual Stewart Island Shag at Taiaroa Head. *Notornis* **40**, 270–272.

Kennedy M, Gray RD and Spencer HG (2000). The phylogenetic relationships of the shags and cormorants: can sequence data resolve a disagreement between behaviour and morphology? *Molecular Phylogenetics and Evolution* **17**, 345–359.

Kennedy M, Aspinall S and Page RDM (2001). The phylogenetic position of the Socotra Cormorant *Phalacrocorax nigrogularis*, a near-endemic of the Arabian Gulf. *Tribulus* **11**, 5–8.

Kennedy M, Holland BR, Gray RD and Spencer HG (2005). Untangling long branches: identifying conflicting phylogenetic signals using spectral analysis, neighbour-net, and consensus networks. *Systematic Biology* **54**, 620–633.

Kikkawa J (2003). The Capricorn White-eye *Zosterops chlorocephalus*. *Sunbird* **33**, 64–76.

Kimball RT, Braun EL, Zwartjes PW, Crowe TM and Ligon JD (1999). A molecular phylogeny of the pheasants and partridges suggests that these lineages are not monophyletic. *Molecular Phylogenetics and Evolution* **11**, 38–54.

King B (2005). The taxonomic status of the three subspecies of *Cuculus saturatus*. *Bulletin of the British Ornithologists' Club* **125**, 48–55.

Kinsky FC (convener). (1970). *Annotated Checklist of the Birds of New Zealand including Birds of the Ross Dependency*. A. H. and A. W. Reed, for the Ornithological Society of New Zealand, Wellington.

Kinsky FC and Falla RA (1976). A subspecific revision of the Australasian Blue Penguin (*Eudyptula minor*) in the New Zealand area. *National Museum of New Zealand Records* **1**, 105–126.

Kirwan GM (1996). Family Rostratulidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 292–301. Lynx Edicions, Barcelona.

Kitto GB and Wilson AC (1966). Evolution of malate dehydrogenase in birds. *Science* **153**, 1408–1410.

Klicka J and Zink RM (1997). The importance of recent ice ages in speciation: a failed paradigm. *Science* **277**, 1666–1669.

Klicka J, Voelker G and Spellman GM (2005). A molecular phylogenetic analysis of the 'true thrushes' (Aves: Turdinae). *Molecular Phylogenetics and Evolution* **34**, 486–500.

Knox AG (1980). Feather protein evidence of the relationships of African *Halcyon* species. *Ibis* **122**, 72–74.

Knox, AG (1987). Taxonomic status of 'Lesser Golden Plovers'. *British Birds* **80**, 482–487.

Knox AG (1994). Lumping and splitting of species. *British Birds* **87**, 149–159.

Knox AG, Helbig AJ, Parkin DT and Sangster G (2001). The taxonomic status of Lesser Redpoll. *British Birds* **94**, 260–267.

Knox AG, Collinson M, Helbig AJ, Parkin DT and Sangster G (2002). Taxonomic recommendations for British birds. *Ibis* **144**, 707–710.

König C, Weick F and Becking J-H (1999). *Owls. A Guide to the Owls of the World*. Pica Press, Sussex.

Kornegay JR, Kocher TD, Williams LA and Wilson AC (1993). Pathways of lysozyme evolution inferred from the sequences of cytochrome *b* in birds. *Journal of Molecular Evolution* **37**, 367–379.

Koopman KF (1957). Evolution in the genus *Myzomela* (Aves: Meliphagidae). *Auk* **74**, 49–72.

Korzun LP, Erard C, Gasc J-P and Dzerzhinsky FJ (2003). Biomechanical features of the bill and jaw apparatus of cuckoos, turacos and the hoatzin in relation to food acquisition and processing. *Ostrich* **74**, 8–57.

Krajewski C (1989). Phylogenetic relationships among cranes (Gruiformes: Gruidae) based on DNA hybridization. *Auk* **106**, 603–618.

Krajewski C and Fetzner JW Jr (1994). Phylogeny of cranes (Gruiformes: Gruidae) based on cytochrome *b* DNA sequences. *Auk* **111**, 351–365.

Krajewski C and Wood TC (1995). Mitochondrial DNA relationships within the Sarus Crane species group (Gruiformes: Gruidae). *Emu* **95**, 99–105.

Ksepka DT, Bertelli S and Giannini NP (2006). The phylogeny of the living and fossil Sphenisciformes (penguins). *Cladistics* **22**, 412–441.

Kuroda N (1954). *On the Classification and Phylogeny of the Order Tubinares, Particularly the Shearwaters* (*Puffinus*), *with Special Considerations on their Osteology and Habitat Differentiation*. Published by the author, Tokyo.

Kuroda N (1986). On the intestinal twistings in gadfly petrels and comparative notes on the digestive tract in Procellariiformes. *Japanese Journal of Ornithology* **6**, 1–14.

Kuroda N, Kakizawa R and Watada M (1990). Genetic divergence and relationships in fifteen species of Procellariiformes. *Yamashina Institute of Ornithology* **22**, 114–123.

Kushlan JA and Hancock JA (2005). *Herons*. Oxford University Press, Oxford.

Kusmierski R, Borgia G, Crozier RH and Chan BHY (1993). Molecular information on bowerbird phylogeny and the evolution of exaggerated male characteristics. *Journal of Evolutionary Biology* **6**, 737–752.

Kusmierski R, Borgia G, Uy A and Crozier RH (1997). Labile evolution of display traits in bowerbirds indicates reduced effects of phylogenetic constraint. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **264**, 307–313.

Lalas C and Heather BD (1980). The morphology, moult and taxonomic status of the Black-fronted Tern. *Notornis* **27**, 45–68.

Lambert FR (1998). A new species of *Amaurornis* from the Talaud Islands, Indonesia, and a review of taxonomy of bush hens occurring from the Philippines to Australasia. *Bulletin of the British Ornithologists' Club* **118**, 67–82.

Lane BA and Rogers DI (2000). The Australian Painted Snipe *Rostratula* (*benghalensis*) *australis*: an endangered species. *Stilt* **36**, 26–34.

Lane J (2002). A Grey Heron *Ardea cinerea* in Busselton, Western Australia: first record for Australia? *Western Australian Bird Notes* **103**, 1–4.

Lansley PS (2004). A Red-capped Flowerpecker *Dicaeum* (*pectorale*) *geelvinkianum* on Saibai Island, Torres Strait, Australia. *Australian Field Ornithology* **21**, 33–36.

Lansley PS, Watson J and Farnes RF (2003). Brown Shrike *Lanius cristatus* on Christmas Island, Indian Ocean. *Australian Field Ornithology* **20**, 139–141.

Lanyon SM (1992). Review of `Sibley CG and Ahlquist JE. Phylogeny and Classification of Birds. A Study in Molecular Evolution. 1990'. *Condor* **94**, 304–307.

Larsen C, Speed M, Harvey N and Noyes HA (2007). A molecular phylogeny of the nightjars (Aves: Caprimulgidae) suggests extensive conservation of primitive morphological traits across multiple lineages. *Molecular Phylogenetics and Evolution* **42**, 789–796.

Latham J (1802). *Supplementum Indicis Ornithologici*. Leigh and Sotheby, London.

Lee K, Feinstein J and Cracraft J (1997). The phylogeny of ratite birds: resolving conflicts between molecular and morphological data sets. In *Avian Molecular Evolution and Systematics* (Ed. DP Mindell) pp. 173–211. Academic Press. San Diego..

Lee PM, Clayton DL, Griffiths R and Page RDM (1996). Does behavior reflect phylogeny in swiftlets (Aves: Apodidae)? A test using cytochrome *b* mitochondrial DNA sequences. *Proceedings of the National Academy of Sciences, USA* **93**, 7091–7096.

Leeton PRJ, Christidis L, Westerman, M. and Boles, W. E. (1994). Molecular phylogenetic relationships of the Night Parrot (*Geopsittacus occidentalis*) and the Ground Parrot (*Pezoporus wallicus*). *Auk* **111**, 833–843.

Lei F-M, Zhao H-F, Wang G and Payne RB (2003). Vocalizations and species limits of the plaintive cuckoo (*Cacomantis merulinus*) and the brush cuckoo (*C. variolosus*). *Folia Zoologica* **52**, 399–411.

Leisler B, Heidrich P, Schulze-Hagen K and Wink M (1997). Taxonomy and phylogeny of reed warblers (genus *Acrocephalus*) based on mtDNA sequences and morphology. *Journal für Ornithologie* **138**, 469–496.

Lerner HRL and Mindell DP (2005). Phylogeny of eagles, Old World vultures, and other Accipitridae based on nuclear and mitochondrial DNA. *Molecular Phylogenetics and Evolution* **37**, 327–346.

Ligon, JD (1967). Relationships of the cathartid vultures. *Occasional Papers of the University of Michigan Museum of Zology* **651**, 1–26.

Lindsey TR (1987). *The Seabirds of Australia*. Angus and Robertson, Sydney.

Lister JJ (1888). On the natural history of Christmas Island, in the Indian Ocean. *Proceedings of the Zoological Society of London* **1888**, 512–531.

Livezey BC (1986). A phylogenetic analysis of recent anseriform genera using morphological characters. *Auk* **103**, 737–754.

Livezey BC (1989). Phylogenetic relationships of several subfossil Anseriformes of New Zealand. *Occasional Papers of the Museum of Natural History, The University of Kansas* **128**, 1–25.

Livezey BC (1991). A phylogenetic analysis and classification of recent dabbling ducks (Tribe Anatini) based on comparative morphology. *Auk* **108**, 471–507.

Livezey BC (1995a). A phylogenetic analysis of the whistling and White-backed Ducks (Anatidae: Dendrocygninae) using morphological characters. *Annals of Carnegie Museum* **64**, 65–97.

Livezey BC (1995b). Phylogeny and comparative ecology of stiff-tailed ducks (Anatidae: Oxyurini). *Wilson Bulletin* **107**, 214–234.

Livezey BC (1995c). Phylogeny and evolutionary ecology of modern seaducks (Anatidae: Mergini). *Condor* **97**, 233–255.

Livezey BC (1996a). A phylogenetic reassessment of the tadornine-anatine divergence (Aves: Anseriformes: Anatidae). *Annals of the Carnegie Museum* **65**, 27–88.

Livezey BC (1996b). A phylogenetic analysis of the geese and swans (Anseriformes: Anserinae), including selected fossil species. *Systematic Biology* **45**, 15–50.

Livezey BC (1996c). A phylogenetic analysis of modern pochards (Anatidae: Aythyini). *Auk* **113**, 74–93.

Livezey BC (1997a). A phylogenetic analysis of basal Anseriformes, the fossil *Presbyornis*, and the intrordinal relationships of waterfowl. *Zoological Journal of the Linnean Society* **121**, 361–428 [Errata: *ZJLS* 124: 397–398 (1998)].

Livezey BC (1997b). A phylogenetic classification of waterfowl (Aves: Anseriformes), including selected fossil species. *Annals of the Carnegie Museum* **66**, 457–496.

Livezey BC (1997c). A phylogenetic analysis of modern sheldgeese and shelducks (Anatidae, Tadornini). *Ibis* **139**, 51–56.

Livezey BC (1998). A phylogenetic analysis of the Gruiformes (Aves) based on morphological characters, with an emphasis on the rails (Rallidae). *Philosophical Transactions of the Royal Society of London* B **353**, 2077–2151.

Livezey BC and Zusi RL (2001). Higher-order phylogenetics of modern Aves based on comparative anatomy. *Netherlands Journal of Zoology* **51**, 179–205.

Livezey B C and Zusi RL (2006). Higher-order phylogeny of modern birds (Theropoda, Aves: Neornithes) based on comparative anatomy. I. – Methods and characters. *Bulletin of Carnegie Museum of Natural History* **37**, 1–544.

Livezey B C and Zusi RL (2007). Higher-order phylogeny of modern birds (Theropoda, Aves: Neornithes) based on comparative anatomy. II. – Analysis and discussion. *Zoological Journal of the Linnean Society* **149,** 1–94.

Llimona E and del Hoyo J (1992). Order Podicipediformes. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 174–196. Lynx Edicions, Barcelona.

Longmore NW (1991). [*Aerodramus chillagoensis*] In *An Atlas of Queensland's Frogs, Reptiles, Birds and Mammals* (Eds GJ Ingram and RJ Raven) pp. 217, 365. Trustees of the Queensland Museum, Brisbane.

Lovette IJ and Rubenstein DR (2007). A comprehensive molecular phylogeny of the starlings (Aves: Sturnidae) and mockingbirds (Aves: Mimidae): congruent mtDNA and nuclear tress for a cosmopolitan avian radiation. *Molecular Phylogenetics and Evolution* **44**, 1031–1056.

Lowe KW and Richards GC (1991). Morphological variation in the Sacred Ibis *Threskiornis aethiopicus* superspecies complex. *Emu* **91**, 41–45.

Lowe PR (1915). Studies on the Charadriiformes, II. On the osteology of the Chatham snipe (*Coenocorypha pusilla* Buller). *Ibis* **57**, 690–716.

Macdonald JD (1968). Notes on the genus *Cinclosoma*. *Emu* **67**, 283–289.

Macdonald JD (1971). Validity of the buff-breasted quail. *Sunbird* **2**, 1–5.

Mace GM (2004). The role of taxonomy in species conservation. *Philosophical Transactions of the Royal Society London B* **359**, 711–719.

Maclean GL (1967). Die systematische Stellung der Flughühner Pteroclidae. *Journal für Ornithologie* **108**, 203–217.

Maclean GL (1976). A field study of the Australian Dotterel. *Emu* **76**, 207–215.

Maclean GL (1996). Family Glareolidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 364–383. Lynx Edicions, Barcelona.

Maclean N, Collison M and Newell RG (2005). Taxonomy for birders: a beginner's guide to DNA and species problems. *British Birds* **98**, 512–537.

Madge S and McGowan P (2002). *Pheasants, Partridges and Grouse. Including Buttonquails, Sandgrouse and Allies*. Christopher Helm, London.

Madsen CS, McHugh KP and De Kloet SR (1988). A partial classification of waterfowl (Anatidae) based on single-copy DNA. *Auk* **105**, 452–459.

Manegold A (2006). Two additional synapomorphies of grebes Podicipedidae and flamingos Phoenicopteridae. *Acta Ornithologica* **41**, 79–82.

Marchant S (1972). Evolution of the genus *Chrysococcyx*. *Ibis* **114**, 219–233.

Marchant S and Higgins PJ (Coordinators) (1990). *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 1A. Ratites to Ducks.* Oxford University Press, Melbourne.

Marchant S and Higgins PJ (Eds)(1993). *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 2. Raptors to Lapwings.* Oxford University Press, Melbourne.

Mariaux J and Braun MJ (1996). A molecular phylogenetic survey of the nightjars and allies (Caprimulgiformes) with special emphasis on the potoos (Nyctibiidae). *Molecular Phylogenetics and Evolution* **6**, 228–244.

Marks JS, Cannings RJ and Mikkola H (1999). Family Strigidae. In *Handbook of the Birds of the World. Vol. 5. Barn-owls to Hummingbirds* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 76–151. Lynx Edicions, Barcelona.

Martínez I. (1992). Order Sphenisciformes. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A.Elliot and J Sargatal) pp. 140–160. Lynx Edicions, Barcelona.

Martínez-Vilalta A and Motis A (1992). Family Ardeidae. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliott and J Sargatal) pp. 376–429. Lynx Edicions, Barcelona.

Mason IJ (1982). The identity of certain early Australian types referred to the Cuculidae. *Bulletin of the British Ornithologists' Club* **102**, 99–106.

Mason IJ (1983). A new subspecies of Masked Owl *Tyto novaehollandiae* (Stephens) from southern New Guinea. *Bulletin of the British Ornithologists' Club* **103**, 123–128.

Mason IJ (1997). Cuculidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). *Zoological Catalogue of Australia*. Vol. 37.2 (Eds Houston, WWK and Wells, A) pp. 219–254. CSIRO Publishing, Melbourne.

Matheu E and del Hoyo J (1992). Family Threskiornithidae. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliott and J Sargatal) pp. 472–506. Lynx Edicions, Barcelona.

Mathews GM (1915). *Raperia godmanae*. A new bird from Lord Howe Island, now extinct. *Austral Avian Record* **3**, 21–24.

Mathews GM (1942). New genus. *Emu* **41**, 305.

Mathews GM (1948). Systematic notes on the petrels. *Bulletin of the British Ornithologists' Club* **68**, 155–170.

Maurer DR and Raikow RJ (1981). Appendicular myology, phylogeny, and classification of the avian order Coraciiformes (including Trogoniformes). *Annals of the Carnegie Museum* **50**, 417–434.

Mayr E (1938). Birds collected from the Whitney South Sea Expedition. XXII. *American Museum Novitates* **1007**, 1–16.

Mayr E (1943). Notes on Australian birds. (II). *Emu* **43**, 1–17.

Mayr E (1949). A second Australian record of the Corn Crake *Crex crex*. *Emu* **48**, 243–244.

Mayr E (1949). Notes on the birds of Northern Melanesia. 2. *American Museum Novitates* **1417**, 1–38.

Mayr E (1953). Geographic and individual variation in the Shrike-tit (*Falcunculus frontatus*). Emu **53**, 249–252.

Mayr E (1963). *Animal Species and Evolution*. Belknap Press, Harvard University, Cambridge, Massachusetts.

Mayr E (1964). On the taxonomy of *Cuculus pallidus* (Latham). *Emu* **64**, 41.

Mayr E (1967). Pachycephalinae. In *Check-list of Birds of the World*. Vol. 12 (Ed. RA Paynter Jr) pp. 3–51. Museum of Comparative Zoology, Cambridge, Massachusetts.

Mayr E (1970). *Populations, Species and Evolution*. Belknap Press, Harvard University, Cambridge, Massachuchetts.

Mayr E (1979). Order Struthioniformes. In *Check-list of Birds of the World*. Vol. 1, rev. edn (Eds E Mayr and GW Cottrell) pp. 3–11. Museum of Comparative Zoology, Cambridge, Massachusetts.

Mayr E (1982). *The Growth of Biological Thought*. Belknap Press, Harvard University, Cambridge, Massachuchetts.

Mayr E (1986a). Family Maluridae. In *Check-list of Birds of the World*. Vol. 11 (Eds E Mayr and GW Cottrell) pp. 390–409. Museum of Comparative Zoology, Cambridge, Massachusetts.

Mayr E (1986b). Family Acanthizidae. In *Check-list of Birds of the World*. Vol. 11 (Eds E Mayr and GW Cottrell) pp. 409–464. Museum of Comparative Zoology, Cambridge, Massachusetts.

Mayr E (1986c). Family Eopsaltriidae. In *Check-list of Birds of the World*. Vol. 11 (Eds E Mayr and GW Cottrell) pp. 556–583. Museum of Comparative Zoology, Cambridge, Massachusetts.

Mayr E and Amadon, D (1951). A classification of recent birds. *American Museum Novitates* **1496**: 1–42.

Mayr E and Bock WJ (1994). Provisional classifications v. standard avian sequences: heuristics and communication in ornithology. *Ibis* **136**, 12–18.

Mayr E and Moynihan M (1946). Evolution in the *Rhipidura rufifrons* group. *American Museum Novitates* **1321**, 1–21.

Mayr E and Short LL (1970). Species taxa of North American birds. A contribution to comparative systematics. *Publications of the Nuttall Ornithologists' Club* **9**, 1–127.

Mayr G (1998). 'Coraciiforme' und 'piciforme' Kleinvögel aus dem Mittel-Eozän der Grube Messel (Hessen, Deutschland). *Courier Forschungsinstitut Senckenberg* **205**, 1–101.

Mayr G (2000). A new basal galliform bird from the Middle Eocene of Messel (Hessen, Germany). *Senckenbergiana Lethaea* **80**, 45–57.

Mayr G (2002). On the osteology and phylogenetic affinities of the Pseudasturidae: Lower Eocene stem-group representatives of parrots (Aves, Psittaciformes). *Zoological Journal of the Linnean Society* **136**, 715–729.

Mayr G (2002). Osteological evidence for paraphyly of the avian order Caprimulgiformes (nightjars and allies). *Journal für Ornithologie* **143**, 82–97.

Mayr G (2003) On the phylogenetic relationships of trogons (Aves, Trogonidae). *Journal of Avian Biology* **34**, 81–88.

Mayr G (2004). Morphological evidence for a sister group relationship between flamingos (Aves: Phoenicopteridae) and grebes (Podicipedidae). *Zoological Journal of the Linnean Society* **140**, 157–169.

Mayr G (2005a). Tertiary plotopterids (Aves, Plotopteridae) and a novel hypothesis on the phylogenetic relationships of penguins (Spheniscidae). *Journal of Zoological Systematics and Evolutionary Research* **43**, 61–71.

Mayr G (2005b). The postcranial osteology and phylogenetic position of the middle Eocene *Messelastur gratulator* Peters, 1994—a morphological link between owls (Strigiformes) and falconiform birds? *Journal of Vertebrate Paleontology* **25**, 635–645.

Mayr G and Clarke J (2003). The deep divergences of neornithine birds: a phylogenetic analysis of morphological characters. *Cladistics* **19**, 527–553.

Mayr G and Daniels M (1998). Eocene parrots from Messel (Hessen, Germany) and the London Clay of Walton-on-the-Naze (Essex, England). *Senckenbergiana Lethaea* **78**, 157–177.

Mayr G and Ericson PGP (2004). Evidence for a sister group relationship between the Madagascan mesites (Mesitornithidae) and the cuckoos (Cuculidae). *Senckenbergiana Biologica* **84**, 1–17.

Mayr G and Göhlich UB (2004). A new parrot from the Miocene of Germany, with comments on the variation of hypotarsus morphology in some Psittaciformes. *Belgian Journal of Zoology* **134**, 47–54.

Mayr G, Manegold A and Johansson US (2003). Monophyletic groups within 'higher land birds' – comparison of morphological and molecular data. *Journal of Zoological Systematics and Evolutionary Research* **41**, 233–248.

McAllan IAW (2002). Some old petrel records. *Australian Bird Watcher* **19**, 219–224.

McAllan IAW (2007). Existing usage and the names of some Australian birds. *Bulletin of the British Ornithologists' Club* **127**, 136–145.

McAllan IAW and Bruce MD (1988 [=1989]). *The Birds of New South Wales – A Working List*. Biocon Research Group, Turramurra, NSW.

McAllan IAW and Christidis L (1998). Neotype of the Hooded Plover *Charadrius rubricollis* Gmelin, 1789. *Bulletin of the British Ornithologists' Club* **118**, 59–61.

McAllan IAW, Curtis BR, Hutton I and Cooper RM (2004). The birds of the Lord Howe Island Group: A review of records. *Australian Field Ornithology* **21 supplement**, 1–82.

McAllan IAW, Cooper RM and Hobcroft D (2005). The Kermadec Storm-Petrel *Pelagodroma* (*marina*) *albiclunis*: an overlooked Australian taxon. *Australian Field Ornithology* **22**, 201–206.

McBride A (1989). The first record of the Pink-footed Shearwater *Puffinus creatopus* in Australian waters. *Australian Birds* **22**, 87–88.

McCracken KG and Sheldon FH (1997). Avian vocalizations and phylogenetic signal. *Proceedings of the National Academy of Sciences, USA* **94**, 3833–3836.

McCracken KG and Sheldon FH (1998). Molecular and osteological heron phylogenies: sources of incongruence. *Auk* **115**, 127–141.

McCracken KG, Harshman J, McClellan DA and Afton AD (1999). Data set incongruence and correlated character evolution: an example of functional convergence in the hind-limbs of stifftail diving ducks. *Systematic Biology* **48**, 683–714.

McCracken KG, Fullagar PJ, Slater EC, Paton DC and Afton AD (2002). Advertising displays of male Musk Ducks indicate population subdivision across the Nullarbor Plain of Australia. *Wildfowl* **53**, 137–154.

McCrie N (1995). First record of the Kentish Plover *Charadrius alexandrinus* in Australia. *Australian Bird Watcher* **16**, 91–95.

McCrie N (2000). A sighting of a Green Sandpiper *Tringa ochropus* at Darwin, Northern Territory. *Australian Bird Watcher* **18**, 229–232.

McGowan PJK (1994). Family Phasianidae. In *Handbook of the Birds of the World. Vol. 2. New World Vultures to Guineafowl* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 434–552. Lynx Edicions, Barcelona.

McKean JL (1978). Some remarks on the taxonomy of Australasian oystercatchers, *Haematopus* spp. *Sunbird* **9**, 3–6.

McKean JL (1979). *Botaurus poiciloptilus* and the 'overlump' syndrome. *Sunbird* **10**, 39–40.

McKean JL and Hindwood KA (1965). Additional notes on the birds of Lord Howe Island. *Emu* **64**, 79–97.

McKitrick MC (1991). Phylogenetic analysis of avain hindlimb musculature. *Miscellaneous Publications, Museum of Zoology, University of Michigan* **179**, 1–87.

McKitrick MC and Zink RM (1988). Species concepts in ornithology. *Condor* **90**, 1–14.

Meadows G and Meadows E (2000). First record of a Long-tailed Cuckoo *Eudynamys taitensis* on mainland Australia. *Australian Bird Watcher* **18**, 286.

Medway DG (1993). The identity of the Chocolate Albatross *Diomedea spadicea* of Gmelin, 1789 and of the Wandering Albatross *Diomedea exulans* of Linnaeus, 1758. *Notornis* **40**, 145–162.

Medway Lord and Pye JD (1977). Echolocation and the systematics of swiftlets. In *Evolutionary Ecology* (Eds B Stonehouse and CM Perrins) pp. 225–238. Macmillan, London.

Mees GF (1957). A systematic review of the Indo-Australian Zosteropidae (Part II). *Zoologische Verhandelingen* **35**, 1–204.

Mees GF (1961). An annotated catalogue of a collection of bird-skins from west Pilbara, Western Australia. *Journal of the Royal Society of Western Australia* **44**, 97–143.

Mees GF (1964). A revision of the Australian owls (Strigidae and Tytonidae). *Zoologische Verhandelingen* **65**, 1–62.

Mees GF (1969a). Letter to the editor. *Notornis* **16**, 215.

Mees GF (1969b). A systematic review of the Indo-Australian Zosteropidae (Part III). *Zoologische Verhandelingen* **102**, 1–390.

Mees GF (1977). The subspecies of *Chlidonias hybridus* (Pallas), their breeding distribution and migration (Aves, Laridae, Sterninae). *Zoologische Verhandelingen* **157**, 1–64.

Mees GF (1982a). Bird records from the Moluccas. *Zoologische Mededeelingen* **56**, 91–111.

Mees GF (1982b). Birds from the lowlands of southern New Guinea (Merauke and Koembe). *Zoologische Verhandelingen* 191, 1–188.

Mees GF (1986). A list of the birds recorded from Bangka Island, Indonesia. *Zoologische Verhandelingen* **232**, 1–176.

Meinertzhagen AC (1924). A review of the genus *Burhinus*. *Ibis* **(ser. 11) 6**, 329–356.

Meinertzhagen R (1954). *The Birds of Arabia*. Oliver and Boyd, Edinburgh.

Meise W (1931). Zur Systematik der Gattung *Gerygone*. *Novitates Zoologica* 36, 317–379.

Meredith CW (1985). The Vertebrate Fossil Fauna of Norfolk Island and the Phylogeny of the Genus *Pterodroma*. PhD thesis, Monash University, Melbourne.

Meredith MAM and Sin FYY (1988a). Morphometric analysis of four populations of the Little Blue Penguin *Eudyptula minor*. *Journal of Natural History* **22**, 801–809.

Meredith MAM and Sin FYY (1988b). Genetic variation of four populations of the Little Blue Penguin *Eudyptula minor*. *Heredity* **60**, 69–76.

Mey E (1999). Phylogenetic relationships of the Megapodiidae as indicated by their ischnoceran, in particular goniodid, chewing lice (Insecta: Phthiraptera). In *Proceedings of the Third International Megapode Symposium*, Nhill, Australia, December 1997 (Eds RWRJ Dekker, DN Jones and J Benshemesh). *Zoologische Verhandelingen* **327**, 23–35.

Millener PR and Powlesland RG (2001). The Chatham Islands pigeon (Parea) deserves full species status, *Hemiphaga chathamensis* (Rothschild, 1891); Aves; Columbidae. *Journal of the Royal Society of New Zealand* **31**, 365–383.

Miller WDeW (1912). A revision of the classification of the kingfishers. *Bulletin of the American Museum of Natural History* **31**, 239–311.

Mindell DP (1992). Review of 'Sibley CG and Ahlquist JE. Phylogeny and Classification of Birds. A Study in Molecular Evolution. 1990'. *Systematic Biology* **41**, 126–134.

Mindell DP and Honeycutt RL (1989). Variability in transcribed regions of ribosomal DNA and early divergences in birds. *Auk* **106**, 539–548.

Mindell DP, Sorenson MD, Huddleston CJ, Miranda HC Jr., Knight A, Sawchuk SJ and Yuri T (1997). Phylogenetic relationships among and within select avian orders based on mitochondrial DNA. In *Avian Molecular Evolution and Systematics* (Eds DP Mindell) pp. 213–247. Academic Press, San Diego, California.

Mindell DP, Sorenson MD, Dimcheff DE, Hasegawa M, Ast JC and Yuri T (1999). Interordinal relationships of birds and other reptiles based on whole mitochondrial genomes. *Systematic Biology* **48**, 138–152.

Mitchell PC (1901). On the anatomy of the kingfishers, with special reference to the conditions of the wing known as eutaxy and diastataxy. *Ibis* **(ser. 8) 1**, 97–123.

Miyaki CY, Matioli SR, Burke T and Wajntal A. (1998). Parrot evolution and paleogeographical events: mitochondrial DNA evidence. *Molecular Biology and Evolution* **15**, 544–551.

Mock D (1977). Review of `Payne RB and Risley CJ. Systematics and evolutionary relationships among the herons (Ardeidae)' *Bird Banding* **48**, 81–84.

Monroe BL Jr (1989). The correct name of the Terek Sandpiper. *Bulletin of the British Ornithologists' Club* **109**, 106–107.

Monroe BL Jr and Browning MR (1992). A re-analysis of *Butorides*. *Bulletin of the British Ornithologists' Club* **112**, 81–85.

Moritz C (1994). Defining 'evolutionarily significant units' for conservation. *Trends in Ecology & Evolution* **9**, 373–375.

Mourer-Chauviré C (1983). Les Gruiformes (Aves) des phosphorites de Quercy (France). 1. Sous-ordre Cariamae (Cariamidae et Phorusrhacidae) systématique and biostratigraphie. *Paleovertebrata* **13**, 83–143.

Mourer-Chaviré C (1992). The Galliformes (Aves) from the Phosphorites du Quercy (France): systematics and biostratigraphy. *Natural History Museum of Los Angeles County, Sciences Series* **36**, 67–95.

Moyle RG (2006). A molecular phylogeny of kingfishers (Alcedinidae) with insights into early biogeographic history. *Auk* **123**, 487–499.

Moyle RG, Cracraft J, Lakim M, Nais J and Sheldon FH (2006). Reconsideration of the phylogenetic relationships of the enigmatic Bornean Bristlehead (*Pityriasis gymnocephala*). *Molecular Phylogenetics and Evolution* **39**, 893–898.

Moynihan M (1959). A revision of the Laridae (Aves). *American Museum Novitates* **1928**, 1–42.

Munshi-South J and Wilkinson GS (2005). Diet influences life span in parrots (Order: Psittaciformes). *Auk* **123**, 108–118.

Murphy RC (1936). *Oceanic Birds of South America*. Vol. 2. American Museum of Natural History, New York.

Murphy RC (1952). The Manx Shearwater, *Puffinus puffinus*, as a species of world-wide distribution. *American Museum Novitates* **1586**, 1–21.

Murphy RC and Harper F (1921). A review of diving petrels. *Bulletin of the American Museum of Natural History* **44**, 495–554.

Nelson JB (1975). The breeding biology of frigatebirds: A comparative view. *Living Bird* **14**, 113–155.

Nemesio A (2001). Colour production and evolution in parrots. *International Journal of Ornithology* **4**, 75–102.

Nicholls JA (2001). Molecular systematics of the thornbills, *Acanthiza*. *Emu* **101**, 33–37.

Nicholls JA, Double MC, Rowell DM and Magrath RD. (2000). The evolution of cooperative and pair breeding in thornbills *Acanthiza* (Pardalotidae). *Journal of Avian Biology* **31**, 1–12.

Niland DC (1996). First record of Spotted Whistling Duck in Australia. *Sunbird* **26**, 39–41.

Nittinger F, Haring E, Pinsker W, Wink M and Gamauf A (2005). Out of Africa? Phylogenetic relationships between *Falco biarmicus* and the other hierofalcons (Aves: Falconidae). *Journal of Zoological Systematics and Evolutionary Research* **43**, 321–331.

Norman J (1987). Morphological and Genetic Differentiation Between Hybridising Taxa of the Inland-Brown Thornbill Complex (Aves: Acanthizidae). Honours Thesis, Australian National University, Canberra.

Norman JA, Christidis L, Westerman M and Hill RFA (1998a). Molecular data confirms the species status of the Christmas Island Hawk-Owl *Ninox natalis*. *Emu* **98**, 197–208.

Norman JA, Olsen PD and Christidis L (1998b). Molecular genetics confirms taxonomic status of the endangered Norfolk Island Boobook *Ninox novaeseelandiae undulata*. *Biological Conservation* **86**, 33–36.

Norman JA, Christidis L, Joseph L, Slikas B and Alpers D (2002). Unravelling a biogeographical knot: the leapfrog distribution pattern of Australo-Papuan sooty owls (Strigiformes) and logrunners (Passeriformes). *Proceedings of the Royal Society of London, Series B, Biological Sciences* **269**, 2127–2133.

Norman JA, Rheindt FE, Rowe DL and Christidis L (2007). Speciation dynamics in the Australo-Papuan *Meliphaga* honeyeaters. *Molecular Phylogenetics and Evolution* **42**, 80–91.

Noske R (1978). Comments on some of the scientific names used in the 'Interim list of Australian Songbirds'. *Australian Birds* **13**, 27–35.

Nunn GB and Cracraft J (1996). Phylogenetic relationships among the major lineages of the birds-of-paradise (Paradisaeidae) using mitochondrial DNA sequences. *Molecular Phylogenetics and Evolution* **5**, 445–459.

Nunn GB and Stanley S. E. (1998). Body size effects and rates of cytochrome *b* evolution in tube-nosed seabirds. *Molecular Biology and Evolution* **15**, 1360–1371.

Nunn GB, Cooper J, Jouventin P, Robertson CJR and Robertson GG (1996). Evolutionary relationships among extant albatrosses (Procellariiformes: Diomedeidae) established from complete cytochrome-b gene sequences. *Auk* **113**, 784–801.

O'Brien RM (1990). Geographical variation in *Eudyptes pachyrhynchus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 1. Ratites to Ducks.* (Coordinators S Marchant and PJ Higgins) p. 204. Oxford University Press, Melbourne.

O'Brien RM and Davies J (1990). A new subspecies of Masked Booby Sula *dactylatra* from Lord Howe, Norfolk and Kermedec Islands. *Marine Ornithology* **18**, 1–7.

O'Hara, RL (1989). An estimate of the phylogeny of the living penguins. *American Zoologist* 29, 11A [Abstract].

Ogawa A, Murata K and Mizuno S (1998). The location of Z- and W-linked marker genes and sequence on the homomorphic sex chromosomes of the ostrich and the emu. *Proceedings of the National Academy of Sciences, USA* **95**, 4415–4418.

Ohmart RD (1967). Comparative moult and pterylography in the quail genera *Callipepla* and *Lophortyx*. *Condor* **69**, 535–548.

Oliver WRB (1955). *New Zealand Birds*. 2nd edn. Reed, Wellington.

Olsen J, Wink M, Sauer-Gurth H and Trost S (2002). A new *Ninox* owl from Sumba, Indonesia. *Emu* **102**, 223–231.

Olsen KM and Larsson H (1997). *Skuas and Jaegers. A Guide to the Skuas and Jaegers of the World*. Pica Press, Sussex, UK.

Olsen PD (1999). Family Strigidae. In *Handbook of the Birds of the World. Vol. 5. Barn-owls to Hummingbirds* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 231–237. Lynx Edicions, Barcelona.

Olsen PD, Marshall RC and Gaal A (1989). Relationships within the genus *Falco*: a comparison of the electrophoretic patterns of feather proteins. *Emu* **89**, 193–203.

Olson SL (1970). The relationships of *Porzana flaviventer*. *Auk* **87**, 805–808.

Olson SL (1973). A classification of the Rallidae. *Wilson Bulletin* **85**, 381–446.

Olson SL (1979a). Multiple origins of the Ciconiiformes. *Proceedings of the Conference of the Colonial Waterbird Group* **1978**, 165–170.

Olson SL (1979b). *Picathartes*—another West African forest relict with probable Asian affinities. *Bulletin of the British Ornithologists' Club* **99**, 112–113.

Olson SL (1985a). The fossil record of birds. In *Avian Biology.* Vol. 8 (Eds DS Farner, J King and KC Parkes) pp. 79–238. Academic Press, New York.

Olson SL (1985b). Early Pliocene Procellariiformes (Aves) from Langebaaneng, south-western Cape Province, South Africa. *Annals of the South African Museum* **95**, 123–145.

Olson SL (1989). Preliminary systematic notes on some Old World passerines. *Rivista Italiana di Ornithologica* **59**, 183–195.

Olson SL (1992). Requiescat for *Tricholimnas conditicius*, a rail that never was. *Bulletin of the British Ornithologists' Club* **112**, 174–179.

Olson SL (1998a). Comment on the proposed suppression of all prior usages of generic and specific names of birds (Aves) by John Gould and others conventionally accepted as published in the *Proceedings of the Zoological Society of London*. *Bulletin of Zoological Nomenclature* **55**, 178–181.

Olson SL (1998b). Lectotypification of *Charadrius rubricollis* Gmelin, 1789. *Bulletin of the British Ornithologists' Club* **118**, 256–259.

Olson SL (2000). A new genus for the Kerguelen Petrel. *Bulletin of the British Ornithologists' Club* **120**, 59–62.

Olson SL (2005). First occurrence of *Gygis microrhyncha* in the Hawaiian Islands. *Bulletin of the British Ornitologists Union* **125**, 155–156.

Olson SL and Feduccia A (1980a). *Presbyornis* and the origin of the Anseriformes (Aves: Charadriomorphae). *Smithsonian Contributions to Zoology* **323**, 1–24.

Olson SL and Feduccia A (1980b). Relationships and evolution of flamingos (Aves: Phoenicopteridae). *Smithsonian Contributions in Zoology* **316**, 1–73.

Olson SL and Steadman DW (1981). The relationships of the Pedionomidae (Aves: Charadriiformes). *Smithsonian Contributions in Zoology* **337**, 1–25.

Olson SL and Warheit KI (1988). A new genus for *Sula abbotti*. *Bulletin of the British Ornithologists' Club* **108**, 9–12.

Olson SL, Balouet JC and Fisher, CT (1987). The owlet-nightjar of New Caledonia, *Aegotheles savesi*, with comments on the systematics of the Aegothelidae. *Le Gerfaut* **77**, 341–352.

Orta J (1992a). Family Fregatidae. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 362–374. Lynx Edicions, Barcelona.

Orta J (1992b). Family Anhingidae. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 354–361. Lynx Edicions, Barcelona.

Orta J (1992c). Family Phalacrocoracidae. In *Handbook of the Birds of the World. Vol. 1. Ostrich to Ducks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 326–353. Lynx Edicions, Barcelona.

Orta J (1994d). Family Accipitridae [species accounts] In *Handbook of the Birds of the World. Vol. 2. New World Vultures to Guineafowl* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 111–112, 118–119. Lynx Edicions, Barcelona.

Ottvall R, Bensch S, Walinder G, and Lifjeld JT (2002). No evidence of genetic differentiation between Lesser Redpolls *Carduelis flammea cabaret* and Common Redpolls *Carduelis f. flammea*. *Avian Science* **2**, 237–244.

Ovenden JR, Mackinlay AG and Crozier RH (1987). Systematic and mitochondrial genome evolution of Australian rosellas (Aves: Platycercidae). *Molecular Biology and Evolution* **4**, 526–543.

Palliser T (1999). Rare birds in 1998. *Wingspan* **9(3)**, 27–30.

Palliser T (2001). Rare birds in 2000. *Wingspan* **11(4)**, 18–20.

Palliser T (2002a). Rare birds in 2001. *Wingspan* **12(3)**, 18–21.

Palliser T (2002b). Tristram's Storm-Petrel *Oceanodroma tristrami* off Sydney, New South Wales: a new bird for Australia. *Australian Bird Watcher* **19**, 215–218.

Palliser T (2003). Rare birds in 2002. *Wingspan* **13(3)**, 22–23.

Palliser T (2004). Rare birds in 2003. *Wingspan* **14(3)**, 38–39.

Palliser T (2005). Rare birds in 2004. *Wingspan* **15(3)**, 38–39.

Palliser T (2006). Rare birds in 2005. *Wingspan* **16(3)**, 36–37.

Palliser T and Eades DW (2000). Rare birds in 1999. *Wingspan* **10(3)**, 26–27, 29.

Palmer RS (Ed.) (1988). *Handbook of North American Birds. Vol. 4. Diurnal Raptors (Part 1)*. Yale University Press, New Haven, Connecticut.

Parker SA (1971). Distribution of *Meliphaga flavescens* and *M. fusca* in northern Queensland. *Sunbird* **2**, 41–47.

Parker SA (1973). The tongues of *Ephthianura* and *Ashbyia*. *Emu* **73**, 19–20.

Parker SA (1981). Prolegomenon to further studies in the *Chrysococcyx* '*malayanus*' group (Aves, Cuculidae). *Zoologische Verhandelingen* **187**, 1–56.

Parker SA (1982). A new sandpiper of the genus *Calidris*. *South Australian Naturalist* **56**, 63.

Parker SA (1984). The extinct Kangaroo Island Emu, a hitherto-unrecognized species. *Bulletin of the British Ornithologists' Club* **104**, 19–22.

Parker SA and Eckert HJ (1983). Remarks on the taxonomy of the genus *Calamanthus* (fieldwrens). *South Australian Ornithologist* **29**, 65–71.

Parker SA, Eckert HJ and Ragless GB (1985). *An Annotated Checklist of the Birds of South Australia, Part 2A: Waterfowl*. South Australian Ornithologists' Association, Adelaide.

Parkes KC (1955). Systematic notes on North American birds. I. The herons and ibises (Ciconiiformes). *Annals of the Carnegie Museum* **33**, 287–293.

Parkes KC (1982). Nomenclatural notes on the phalaropes. *Bulletin of the British Ornithologists' Club* **102**, 84–85.

Parkes KC and Amadon D (1959). A new species of rail from the Philippine Islands. *Wilson Bulletin* **71**, 301–306.

Pasquet E, Han L-X, Khobkhet O and Cibois A (2001). Towards a molecular systematics of the genus *Crinifer*, and a preliminary phylogeny of the bulbuls (Aves, Passeriformes, Pycnonotidae). *Zoosystema* **23**, 857–863.

Paterson AM, Gray RD and Wallis GP (1993). Parasites, petrels and penguins: Does louse presence reflect seabird phylogeny? *International Journal for Parasitology* **23**, 515–526.

Paterson AM, Wallis GP and Gray RD (1995). Penguins, petrels, and parsimony: Does cladistic analysis of behaviour reflect seabird phylogeny? *Evolution* **49**, 974–989.

Paterson AM, Wallis GP, Wallis LJ and Gray RD (2000). Seabird and louse coevolution: Complex histories revealed by 12S rRNA sequences and reconciliation analyses. *Systematic Biology* **49**, 383–399.

Paton TA and Baker AJ (2006). Sequences from 14 mitochondrial genes provide a well-supported phylogeny of the charadriiform birds congruent with the nuclear RAG-1 tree. *Molecular Phylogenetics and Evolution* **39**, 657–667.

Paton TA, Baker AJ, Groth JG and Barrowclough GF (2003). RAG-1 sequences resolve phylogenetic relationships within charadriiform birds. *Molecular Phylogenetics and Evolution* **29**, 268–278.

Patterson C and Rich PV (1987). The fossil history of the emus, *Dromaius* (Aves: Dromaiinae). *Records of the South Australian Museum* **21**, 85–117.

Patterson RJ (1996). RAOU Records Appraisal Committee: Opinions and Case Summaries 1992–1995. *RAOU Report* **101**.

Pavlova A, Zink RM, Drovetski SV, Red'kin Y and Rohwer S (2003). Phylogeographic patterns in *Motacilla flava* and *Motacilla citreola*: Species limits and population history. *Auk* **120**, 744–758.

Pavlova A, Zink RM, Rowher S, Koblik EA, Red'kin YA, Fadeev IV and Nesterov EV (2005). Mitochondrial DNA and plumage evolution in the white wagtail *Motacilla alba*. *Journal of Avian Biology* **36**, 322–336.

Paxinos EE, James HF, Olson SL, Sorenson MD, Jackson J and Fleischer RC (2002). mtDNA from fossils reveals a radiation of Hawaiian geese recently derived from the Canada goose (*Branta canadensis*). *Proceedings of the National Academy of Science USA* **99**, 1399–1404.

Payne RB (1974). Species limits and variation of the New World Green Herons *Butorides virescens* and Striated Herons *B. striatus*. *Bulletin of the British Ornithologists' Club* **94**, 81–88.

Payne RB (1979). Family Ardeidae. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 193–244. Museum of Comparative Zoology, Cambridge, Massachusetts.

Payne RB (1997). Family Cuculidae. In *Handbook of the Birds of the World. Vol. 4. Sandgrouse to Cuckoos* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 508–607. Lynx Edicions, Barcelona.

Payne RB (2005). *The Cuckoos*. Oxford University Press, New York.

Payne RB and Risley CJ (1976). Systematics and evolutionary relationships among the herons (Ardeidae). *Miscellaneous Publications, Museum of Zoology, University of Michigan* **150**, 1–115.

Payne RB and Sorenson MD (2003). Museum collections as sources of genetic data. *Bonner Zoologische Beiträge* **51**, 97–104.

Paynter RA Jr (1963). Birds from Flores, Lesser Sunda Island. *Breviora* **182**, 1–5.

Pearson AJ (1966). The birds of Christmas Island (Indian Ocean). *Bulletin of the British Ornithologists' Club* **86**, 66–71.

Penhallurick J and Wink M (2004). An analysis of the taxonomy and nomenclature of the Procellariiformes using complete nucleotide sequences of the mitochondrial cytochrome-*b* gene. *Emu* **104**, 125–147.

Pereira SL and Baker AJ (2005). Multiple gene evidence for parallel evolution and retention of ancestral morphological states in the shanks (Charadriiformes: Scolopacidae). *Condor* **107**, 514–526.

Pereira SL and Baker AJ (2006). A molecular timescale for galliform birds accounting for uncertainty in time estimates and heterogeneity of rates of DNA substitutions across lineages and sites. *Molecular Phylogenetics and Evolution* **38**, 499–509.

Peter H-U, Blechschmidt K, Urness RW, Cohen BL, Wilson RH and de Korte J (1994). Molecular systematics of skuas. *Journal für Ornithologie* **135**, 320 [Abstract].

Peters JL (1931). *Check-list of Birds of the World*. Vol. 1. Harvard University Press, Cambridge, Massachusetts.

Peters JL (1934). *Check-list of Birds of the World*. Vol. 2. Harvard University Press, Cambridge, Massachusetts.

Peters JL (1937). *Check-list of Birds of the World*. Vol. 3. Harvard University Press, Cambridge, Massachusetts.

Peters JL (1940). *Check-list of Birds of the World*. Vol. 4. Harvard University Press, Cambridge, Massachusetts.

Peters JL (1945). *Check-list of Birds of the World*. Vol. 5. Harvard University Press, Cambridge, Massachusetts.

Peterson AT (1992). Review of `Sibley CG and Ahlquist JE. Phylogeny and Classification of Birds. A Study in Molecular Evolution. 1990'. *Ibis* **134**, 204–206.

Pierce RJ (1984). Plumage, morphology and hybridisation of New Zealand stilts *Himantopus* spp. *Notornis* **31**, 106–130.

Pierce RJ (1996). Family Recurvirostridae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 332–347. Lynx Edicions, Barcelona.

Piersma T (1996a). Family Scolopacidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 444–487. Lynx Edicions, Barcelona.

Piersma T (1996b). Family Charadriidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 384–409. Lynx Edicions, Barcelona.

Pitra C, Lieckfeldt D, Frahnert S and Fickel J (2002). Phylogenetic relationships and ancestral areas of the bustards (Gruiformes: Otididae), inferred from mitochondrial DNA and nuclear intron sequences. *Molecular Phylogenetics and Evolution* **23**, 63–74.

Poe S and Chubb AL (2004). Birds in a bush: Five genes indicate explosive evolution of avian orders. *Evolution* **58**, 404–415.

Pons J-M, Hassanin A and Crochet P-A (2005). Phylogenetic relationships with the Laridae (Charadriiformes: Aves) inferred from mitochondrial markers. *Molecular Phylogenetics and Evolution* **37**, 686–699.

Poole AF (1994). Family Pandionidae. In *Handbook of the Birds of the World. Vol. 2. New World Vultures to Guineafowl* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 42–51. Lynx Edicions, Barcelona.

Power DM and Ainley DG (1986). Seabird geographic variation: similarity among populations of Leach's Storm-Petrel. *Auk* **103**, 575–585.

Pratt HD, Bruner PL and Berret DG (1987). *A Field Guide to the Birds of Hawaii and the Tropical Pacific*. Princeton University Press, Princeton, New Jersey.

Price JJ, Johnson KP and Clayton DH (2004). The evolution of echolocation in swiftlets. *Journal of Avian Biology* **35**, 135–143.

Price JJ, Johnson KP, Bush SE and Clayton DH (2005). Phylogenetic relationships of the Papuan Swiftlet *Aerodramus papuensis* and implications for the evolution of avian echolocation. *Ibis* **147**, 790–796.

Priddel D, Hutton I, Olson S and Wheeler R (2005). Breeding biology of Masked Boobies (*Sula dactylatra tasmani*) on Lord Howe Island, Australia. *Emu* **105**, 105–113.

Quinn TW (1992). The genetic legacy of Mother Goose – phylogeographic patterns of lesser snow goose *Chen caerulescens caerulescens* maternal lineages. *Molecular Ecology* **1**, 105–117.

Raikow RJ (1982). Monophyly of the Passeriformes: test of a phylogenetic hypothesis. *Auk* **99**, 431–445.

Randi E and Spina F (1987). An electrophoretic approach to the systematics of Italian gulls and terns (Aves, Laridae and Sternidae). *Monitore Zoologico Italiano* **21**, 317–344.

Randi E, Fusco G, Lorenzini R and Crowe TM (1991). Phylogenetic relationships and rates of allozyme evolution within the Phasianidae. *Biochemical Systematics and Ecology* **19**, 213–221.

Randler C (2006). Behavioural and ecological correlates of natural hybridization in birds. *Ibis* **148**, 459–467.

RAOU (Royal Australasian Ornithologists Union) (1978a). Recommended English names for Australian birds. *Emu* **77 Supplement**, 245–313.

RAOU (1978b). Second amendments to the 1975 RAOU Checklist. *Emu* **78**, 80–87.

RAOU (1988). Second report of the Records Appraisal Committee. *Emu* **88**, 54–57.

Rasmussen PC (1991). Relationships between coastal South American King and Blue-eyed Shags. *Condor* **93**, 825–839.

Rasmussen PC (1994). Geographic variation in morphology and allozymes of South American Imperial Shags. *Auk* **111**, 143–181.

Rasmussen PC and Anderton JC (2005). *The Birds of South Asia: The Ripley Guide*. Vol. 2. Lynx Edicions, Barcelona.

Remsen JV (2005). Pattern, process, and rigor meet classification. *Auk* **122**, 403–413.

Rheindt FE and Austin JJ (2005). Major analytical and conceptual shortcomings in a recent taxonomic revision of the Procellariiformes – a reply to Penhallurick and Wink (2004). *Emu* **105**, 181–186.

Rich PV, van Tets GF, Orth K, Meredith C and Davidson P (1983). Prehistory of the Norfolk Island biota. In *A Review of Norfolk Island Birds: Past and Present* (Eds R Schodde, P Fullagar and N Hermes) pp. 7–29. ANPWS Special Publication **No. 8**. Australian National Parks and Wildlife Service, Canberra.

Ripley SD (1977). *Rails of the World*. Goldine, Boston, Massachusetts.

Ritichie PA (2001). The Evolution of the Mitochondrial DNA Control Region in the Adélie Penguins of Antarctica. PhD Thesis, Massey University, New Zealand.

Ritz MS, Hahn S, Janicke,T and Peter H-U (2006). Hybridisation between South polar skua (*Catharacta maccormicki*) and brown skua (*C. antarctica lonnbergi*) in the Antarctic Peninsula region. *Polar Biology* **29**, 153–159.

Roberson D and Bailey SF (1991). *Cookilaria* petrels in the eastern Pacific Ocean: identification and distribution. *American Birds* **45**, 399–403.

Roberts G (1996). A sight record of Singing Starling *Aplonis cantoroides* in Australia. *Sunbird* **26**, 42.

Robertson CJR and Nunn GB (1998). Towards a new taxonomy for albatrosses. In *Albatross Biology and Conservation* (Eds G Robertson and R Gales) pp. 13–19. Surrey Beatty and Sons, Chipping Norton.

Robertson DG (1980). First record of the House Swift *Apus affinis* (Apodidae) in Australia. *Australian Bird Watcher* **8**, 239–242.

Robinson TJ and Matthee CA (1999). Molecular genetic relationships of the extinct ostrich, *Struthio camelus syriacus*: consequences for ostrich introductions into Saudi Arabia. *Animal Conservation* **2**, 165–171.

Rogers DI (1990a). Geographical variation in *Pagodroma nivea*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 1. Ratites to Ducks.* (Coordinators S Marchant and PJ Higgins) p. 409. Oxford University Press, Melbourne.

Rogers DI (1990b). Geographical variation in *Pelecanoides urinatrix*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 1. Ratites to Ducks.* (Coordinators S Marchant and PJ Higgins) pp. 733–734. Oxford University Press, Melbourne.

Rogers DI (1990c). Geographical variation in *Eudyptes chrysolophus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 1. Ratites to Ducks.* (Coordinators S Marchant and PJ Higgins) p. 229. Oxford University Press, Melbourne.

Rogers DI (1993a). Geographical variation in *Rostratula benghalensis*.In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 2. Raptors to Lapwings.* (Eds S Marchant and PJ Higgins) pp. 665–666. Oxford University Press, Melbourne.

Rogers DI (1993b). Geographical variation in *Himantopus himantopus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 2. Raptors to Lapwings.* (Eds S Marchant and PJ Higgins) p. 768. Oxford University Press, Melbourne.

Rogers DI (1999a). Plumages of *Apus affinis*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* (Ed. PJ Higgins) pp. 1092–1093. Oxford University Press, Melbourne.

Rogers DI (1999b). Geographical variation of *Cacomantis variolosus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* (Ed. PJ Higgins) p. 686. Oxford University Press, Melbourne.

Rogers DI (1999c). Geographical variation of *Cuculus saturatus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* (Ed. PJ Higgins) pp. 660–661. Oxford University Press, Melbourne.

Rogers DI (1999d). Plumages of *Chrysococcyx minutillus*, *C. russatus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* (Ed. PJ Higgins) pp. 749–750, 756–757. Oxford University Press, Melbourne.

Rogers DI (1999e). Geographical variation of *Chrysococcyx minutillus*, *C. russatus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* (Ed. PJ Higgins) pp. 751–752, 758–759. Oxford University Press, Melbourne.

Rogers DI (1999f). Geographical variation of *Chrysococcyx lucidus*. In *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* (Ed. PJ Higgins) pp. 741–742. Oxford University Press, Melbourne.

Rogers DI, Collins P, Jessop RE, Minton CDT and Hassell CJ (2005). Gull-billed Terns in north-western Australia: subspecies identification, moults and behavioural notes. *Emu* **105**, 145–158.

Rothschild W and Hartert E (1907). List of a collection of birds made by Mr. A.S. Meek in the mountains of the Upper Aroa River and on the Angabunga River, British New Guinea. *Novitates Zoologicae* **14**, 447–483.

Rotthowe K and Starck JM (1998). Evidence for a phylogenetic position of button quails (Turnicidae: Aves) among the Gruiformes. *Journal of Zoological Systematics and Evolutionary Research* **36**, 39–51.

Roux J-P, Jouventin P, Moulin J-L, Stahl J-C and Weimerskirch H (1983). Un nouvel albatross *Diomedea amsterdamensis* n. sp. Découvert sur I'ile Amersterdam (37° 50' S, 77° 35' E). *L'Oiseau et la Revue Française d'Ornithologie* **53**, 1–11.

Rowley, I. (1997). Family Cacatuidae. In *Handbook of the Birds of the World. Vol. 4. Sandgrouse to Cuckoos* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 246–279. Lynx Edicions, Barcelona.

Ryan P (1998). The taxonomic and conservation status of the Spectacled Petrel *Procellaria conspicillata*. *Bird Conservation International* **8**, 223–235.

Saiff EI (1978). The middle ear of the skull of birds: the Pelecaniformes and Ciconiiformes. *Zoological Journal of the Linnean Society* **63**, 315–370.

Salomonsen F (1967a). Family Meliphagidae. In *Check-list of Birds of the World*. Vol. 12 (Ed. RA Paynter Jr) pp. 338–450. Harvard University Press, Cambridge, Massachusetts.

Salomonsen F (1967b). Family Dicaeidae. In *Check-list of Birds of the World*. Vol. 12 (Ed. RA Paynter Jr) pp. 166–208. Museum of Comparative Zoology, Cambridge, Massachusetts.

Salomonsen F (1983). Revision of the Melanesian swiftlets (Apodes, Aves) and their conspecific forms in the Indo-Australasian and Polynesian region. Noona Dan Papers n. 141. *Biologiske Skrifter Udgivet af Det Kongelige Danske Videnskabernes Selskab* **23**, 1–112.

Sanders SWH (1967). The Osteology and Myology of the Pectoral Appendage of Grebes. Unpublished PhD thesis, University of Michigan.

Sangster G (1997). Species limits in flamingos, with comments on lack of consensus in taxonomy. *Dutch Birding* **19**, 193–198.

Sangster G (1998). Purple Swamp-hen is a complex of species. *Dutch Birding* **20**, 13–22.

Sangster G (2005a). A name for the flamingo-grebe clade. *Ibis* **147**, 612–615.

Sangster G (2005b). A name for the clade formed by owlet-nightjars, swifts and hummingbirds (Aves). *Zootaxa* **799**, 1–6.

Sangster G, Hazevoet CJ, Van Den Berg AB, Roselaar CS and Sluys R. (1999). Dutch avifaunal list: Species concepts, taxonomic instability, and taxonomic changes in 1997–1998. *Ardea* **87**, 139–165.

Sangster G, Collinson JM, Helbig AJ, Knox AG and Parkin DT (2002). The generic status of Black-browed Albatross and other albatrosses. *British Birds* **95**, 583–585.

Saunders DA (1979). Distribution and taxonomy of the White-tailed and Yellow-tailed Black Cockatoos *Calyptorhynchus* spp. *Emu* **79**, 215–227.

Scheider J, Wink M, Stubbe M, Hille S and Wiltschko W (2004). Phylogeograpic relationships of the Black Kite *Milvus migrans*. In *Raptors Worldwide* (Eds RD Chancellor and B-U Meyburg) pp. 467–471. WWGBP/MME, Budapest.

Schliebusch I, Schliebusch G, Henning FW and Schottler B (2001). The systematic status of the Sulphur-crested and the Lesser Sulphur-crested cockatoo. *Papageienkunde* **5**, 166–174.

Schnell GD (1970). A phenetic study of the suborder Lari (Aves) II. Phenograms, discussion, and conclusions. *Systematic Zoology* **19**, 264–302.

Schnell GD and Wood DS (1976). More on chicken-turkey-pheasant resemblances. *Condor* **78**, 550–553.

Schodde R (1975). *Interim List of Australian Songbirds. Passerines*. Royal Australasian Ornithologists Union, Melbourne.

Schodde R (1977). Contributions to Papuasian Ornithology. VI. Survey of the birds of the southern Bougainville Island, Papua New Guinea. *CSIRO Division of Wildlife Research Technical Paper No.* **34**. Commonwealth Scientific and Industrial Research Organisation, Canberra.

Schodde R (1981). Bird communities of the Australian mallee: composition, derivation, distribution, structure and seasonal cycles. In *Mediterranean-Type Shrublands* (Eds F di Castri, DW Goodall and RL Specht) pp. 387–415. Elsevier, Amsterdam.

Schodde R (1982). Origin, adaptation and evolution of birds in arid Australia. In *Evolution of the Flora and Fauna of Arid Australia* (Eds WR Barker and PJM Greenslade) pp. 191–224. Peacock Press, Adelaide.

Schodde R (1989). New subspecies of Australian birds. *Canberra Bird Notes* **13**, 119–122.

Schodde R (1997a). Columbidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 9–63. CSIRO Publishing, Melbourne.

Schodde R (1997b). Cacatuidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 64–108. CSIRO Publishing, Melbourne.

Schodde R (1997c). Psittacidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 109–218. CSIRO Publishing, Melbourne.

Schodde R (1997d). Strigidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 284–298. CSIRO Publishing, Melbourne.

Schodde R (1997e). Tytonidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 264–283. CSIRO Publishing, Melbourne.

Schodde R (1997f). Caprimulgidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 320–329. CSIRO Publishing, Melbourne.

Schodde R (1997g). Apodidae. In Schodde R and Mason IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 330–345. CSIRO Publishing, Melbourne.

Schodde R (1997h). Alcedinidae. In Schodde, R and Mason, IJ. *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). pp. 346–376. CSIRO Publishing, Melbourne.

Schodde R and Bock WJ (1997). Case 3044. Generic and specific names of birds (Aves) conventionally accepted as published in the *Proceedings of the Zoological Society of London* and monographic works by John Gould and other contemporary zoologists: proposed conservation by suppression of all prior usages. *Bulletin of Zoological Nomenclature* **54**, 172–182.

Schodde R and Bock WJ (1998). Comment on the proposed suppression of all prior usages of generic and specific names of birds (Aves) by John Gould and others conventionally accepted as published in the *Proceedings of the Zoological Society of London*. *Bulletin of Zoological Nomenclature* **55**, 181–185.

Schodde R and Bock WJ (1999). Comment on the proposed suppression of all prior usages of generic and specific names of birds (Aves) by John Gould and others conventionally accepted as published in the *Proceedings of the Zoological Society of London*. *Bulletin of Zoological Nomenclature* **56**, 279–280.

Schodde R and Mason IJ (1980 [=1981]). *Nocturnal Birds of Australia*. Lansdowne, Melbourne.

Schodde R and Mason IJ (1997). *Aves* (*Columbidae to Coraciidae*). Zoological Catalogue of Australia. Vol. 37.2 (Eds Houston, WWK and Wells, A). CSIRO Publishing, Melbourne.

Schodde R and Mason IJ (1999). *The Directory of Australian Birds*. Passerines. CSIRO Publishing, Melbourne.

Schodde R and McKean JL (1976). The relationships of some monotypic genera of Australian oscines. In *Proceedings of the 16th International Ornithological Congress* (Eds HJ Frith and JH Calaby) pp. 531–541 Australian Academy of Sciences, Canberra.

Schodde R and Tidemann SC (Consultant Eds). (1986). *Complete Book of Australian Birds*. 2nd edn. Reader's Digest Services, Sydney.

Schodde R and van Tets GF (1981). First record of the Brown Hawk-Owl *Ninox scutulata* from Australasia. *Emu* **81**, 171.

Schodde R, Smith GT Mason IJ and Weatherly RG (1979). Relationships and speciation in the Australian corellas (Psittacidae). *Bulletin of the British Ornithologists' Club* **99**, 128–137.

Schodde R, Mason IJ and Gill HB (1982). The avifauna of Australian mangroves. A brief review of composition, structure and origin. In *Mangrove Ecosystems in Australia. Structure, Function and Management* (Ed. BF Clough) pp. 141–150. Institute of Marine Science in association with Australian National University Press, Canberra.

Schodde R, Fullagar P and Hermes N (1983). A Review of Norfolk Island Birds: Past and Present. *ANPWS Special Publication* **8**. Australian National Parks and Wildlife Service, Canberra.

Schodde R, Bock WJ, Boles WE, Christidis L and Steinheimer F (submitted). John Latham's '*Supplementum Indicis ornithologici sive Systematis Ornithologiae*': proposed determination of date of publication. *Bulletin of Zoological Nomenclature*.

Schreiweis DO (1982). A comparative study of the appendicular musculature of penguins (Aves: Sphenisciformes). *Smithsonian Contributions to Science* **341**, 1–46.

Scofield RP (2005). The supposed Macquarie Island parakeet in the collection of the Canterbury Museum. *Notornis* **52**, 117–120.

Scott IAW (1997). Molecular Phylogenetics of the Genus *Daphoenositta*. PhD thesis, La Trobe University, Bundoora Victoria Australia.

Scribner KT, Talbot SL, Pearce JM, Pierson BJ, Bollinger KS and Derksen DV (2003). Phylogeography of Canada Geese (*Branta canadensis*) in western North America. *Auk* **120**, 889–907.

Seibold I and Helbig AJ (1995). Evolutionary history of New and Old World vultures inferred from nucleotide sequences of the mitochondrial cytochrome *b* gene. *Philosophical Transactions of the Royal Society of London B* **350**, 163–178.

Seibold I, Helbig AJ and Wink M (1993). Molecular systematics of falcons (Family Falconidae). *Naturwissenschaften* **80**, 87–90.

Serventy DL, Condon HT and Mayr E (1965). *Dromaius* Vieillot, 1816 (Aves): Proposed addition to the official list. *Bulletin of Zoological Nomenclature* **22**, 63–65.

Shapiro B, Sibthorpe D, Rambaut A, Austin J, Wragg GM, Bininda-Emonds ORP, Lee PLM and Cooper A (2002). Flight of the Dodo. *Science* **295**, 1683.

Sharpe RB (1894). *Catalogue of the Fulicariae* (*Rallidae and Heliornithidae*) *and Alectorides* (*Aramidae, Eurypygidae, Mesitidae, Rhinochetidae, Gruidae, Psophiidae, and Otididae*) *in the Collection of the British Museum*. Trustees of the British Museum (Natural History), London.

Shaughnessy PD (1975). Variation in facial colour of the Royal Penguin. *Emu* **75**, 147–159.

Shaw G (1789–1813). *The Naturalist's Miscellany* (24 vols). Nodder, London.

Sheldon FH (1987a). Phylogeny of herons estimated from DNA-DNA hybridization data. *Auk* **104**, 97–108.

Sheldon FH (1987b). Rates of single-copy DNA evolution in herons. *Molecular Biology and Evolution* **4**, 56–69.

Sheldon FH and Gill FB (1996). A reconsideration of songbird phylogeny, with emphasis on the evolution of titmice and their sylvioid relatives. *Systematic Biology* **45**, 473–495.

Sheldon FH and Winkler DW (1993). Intergeneric phylogenetic relationships of swallows estimated by DNA-DNA hybridization. *Auk* **110**,798–824.

Sheldon FH, McCracken KG and Stubbing KD (1995). Phylogenetic relationships of the Zigzag Heron (*Zebrilus undulatus*) and the White-crested Bittern (*Tigriornis leucolophus*) estimated by DNA-DNA hybridization. *Auk* **112**, 672–679.

Sheldon FH, Jones CE and McCracken KG (2000). Relative patterns and rates of evolution in heron nuclear and mitochondrial DNA. *Molecular Biology and Evolution* **17**, 437–450.

Sheldon FH, Whittingham LA, Moyle RB, Slikas B and Winkler DW (2005). Phylogeny of swallows (Aves: Hirundinidae) estimated from nuclear and mitochondrial DNA sequences. *Molecular Phylogenetics and Evolution* **35**, 254–270.

Short LL (1969). Taxonomic aspects of avian hybridization. *Auk* **86**, 84–105.

Short LL, Horne JFM and Schodde R (1983). Vocal behaviours, morphology, and hybridization of Australian Spotted and Yellow-rumped Pardalotes (Aves, *Pardalotus*). *American Museum Novitates* **2756**, 1–15.

Shufeldt RW (1900). On the osteology of woodpeckers. *Proceedings of the American Philosophical Society* **39**, 578–622.

Sibley CG (1960). The electrophoretic patterns of avian egg-white proteins as taxonomic characters. *Ibis* **102**, 215–284.

Sibley CG (1970). A comparative study of the egg-white proteins of passerine birds. *Peabody Museum of Natural History Bulletin* **32**, 1–131.

Sibley CG (1976). Protein evidence of the relationships of some Australian passerine birds. In *Proceedings of the XVI International Ornithological Congress* (Eds HJ Frith and JH Calaby) pp. 557–570 Australian Academy of Sciences, Canberra.

Sibley CG and Ahlquist JE (1985). The phylogeny and classification of the Australo-Papuan passerine birds. *Emu* **85**, 1–14.

Sibley CG and Ahlquist JE (1990). *Phylogeny and Classification of Birds. A Study in Molecular Evolution*. Yale University Press, New Haven, Connecticut.

Sibley CG and Monroe BL Jr (1990). *Distribution and Taxonomy of Birds of the World*. Yale University Press, New Haven, Connecticut.

Sibley CG and Monroe BL Jr (1993). *A Supplement to Distribution and Taxonomy of Birds of the World*. Yale University Press, New Haven, Connecticut.

Sibley CG, Ahlquist JE and Monroe BL Jr (1988). A classification of the living birds of the world, based on DNA-DNA hybridization studies. *Auk* **105**, 409–423.

Sibley CG, Ahlquist JE and DeBenedictis P (1993). The phylogenetic relationships of the rails, based on DNA comparisons. *Journal of the Yamashina Institute for Ornithology* **25**, 1–11.

Sibson RB (1948). Black-fronted Terns in the north. *New Zealand Bird Notes* **3**, 10–12.

Siegel-Causey D (1986). The courtship behaviour and mixed-species pairing of King and Imperial Blue-eyed Shags. (*Phalacrocorax albiventer* and *P. atriceps*). *Wilson Bulletin* **98**, 571–580.

Siegel-Causey D (1988). Phylogeny of the Phalacrocoracidae. *Condor* **90**, 885–905.

Siegel-Causey D (1989). Cranial pneumatization in the Phalacrocoracidae. *Wilson Bulletin* **101**, 108–112.

Siegel-Causey D (1992). Review of `Sibley CG and Monroe BL Jr. Distribution and Taxonomy of Birds of the World. 1990'. *Auk* **109**, 939–944.

Siegel-Causey D (1997). Phylogeny of the Pelecaniformes: Molecular systematics of a primitive group. In *Avian Molecular Evolution and Systematics* (Ed. DP Mindell) pp. 159–171. Academic Press, San Diego, California.

Siegel-Causey D and Lefevre C (1989). Holocene records of the Antarctic Shag (*Phalacrocorax* [*Notocarbo*] *bransfieldensis*) in Feugian waters. *Condor* **91**, 408–415.

Simmons RE (2000). *Harriers of the World. Their Behaviour and Ecology*. Oxford University Press, Oxford.

Sindel S and Gill J (1996). *Australian Grass Parakeets*. Surrey Beatty and Sons, Sydney.

Slack KE, Jones CM, Ando T, Harrison GL, Fordyce RE, Arnason U and Penny D (2006). Early penguin fossils, plus mitochondrial genomes, calibrate avian evolution. *Molecular Biology and Evolution* **23**, 1144–1155.

Slikas B (1997). Phylogeny of the avian family Ciconiidae (storks) based on cytochrome *b* sequences and DNA-DNA hybridization distances. *Molecular Phylogenetics and Evolution* **8**, 275–300.

Slikas B, Olson SL and Fleischer RC (2002). Rapid, independent evolution of flightlessness in four species of Pacific Island rails (Rallidae): an analysis based on mitochondrial sequence data. *Journal of Avian Biology* **33**, 5–14.

Smeenk C (1974). Comparative ecological studies of some East African birds of prey. *Ardea* **62**, 1–97.

Smith GA (1975). Systematics of parrots. *Ibis* **117**, 18–68.

Snow DW (1978). *An Atlas of Speciation in African Non-Passerine Birds*. British Museum (Natural History), London.

Somadikarta S (1982). The White-bellied Swiftlet *Collocalia esculenta* from Java. *Bulletin of the British Ornithologists' Club* **102**, 18–20.

Somadikarta S (1986). *Collocalia linchi* Horsfield & Moore – a revision. *Bulletin of the British Ornithologists' Club* **106**, 32–40.

Sorenson MD and Payne RB (2001). A single ancient origin of brood parasitism in African finches: Implications for host-parasite coevolution. *Evolution* **55**, 2550–2567.

Sorenson MD and Payne RB (2005). A molecular genetic analysis of cuckoo phylogeny. In *The Cuckoos*. (RB Payne). pp. 68–94. Oxford University Press, New York.

Sorenson MD, Oneal E, García-Moreno J and Mindell DP (2003). More taxa, more characters: the hoatzin problem is still unresolved. *Molecular Phylogenetics and Evolution* **20**, 1484–1499.

Sorenson MD, Balakrishnan CN and Payne RB (2004). Clade-limited colonization in brood parasitic finches (*Vidua* spp.). *Systematic Biology* **53**, 140–153.

Spear LB, Howell SNG and Ainley DG (1992). Notes on the at-sea identification of some Pacific gadfly petrels (Genus: *Pterodroma*). *Colonial Waterbirds* **15**, 202–218.

Sraml M, Christidis L, Easteal S, Horn P and Collet C (1996). Molecular relationships within Australasian waterfowl (Anseriformes). *Australian Journal of Zoology* **44**, 47–58.

St John J, Cotter J-P and Quinn TW (2005). A recent chicken repeat 1 retrotransposition confirms the Coscoroba-Cape Barren goose clade. *Molecular Phylogenetics and Evolution* **37**, 83–90.

Stapel SO, Leunissen JA, Versteeg M, Wattel J and De Jung W (1984). Ratites as the oldest offshoot of avian stem – evidence from alpha-crystallin A sequences. *Nature* **311**, 257–259.

Steadman DW (1987). Two new species of rails (Aves: Rallidae) from Mangaia, southern Cook Islands. *Pacific Science* **40**, 27–43.

Steinbacher, J. (1979). Family Threskiornithidae. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 253–268. Museum of Comparative Zoology, Cambridge, Massachusetts.

Stokes T (1988). A Review of the Birds of Christmas Island, Indian Ocean. *ANPWS Occasional Paper* **No. 16**. Australian National Parks and Wildlife Service, Canberra.

Stokes T (1990). Confirmation of the Yellow Bittern record from Christmas Island, Indian Ocean. *Australian Bird Watcher* **13**, 165.

Stokes T and Goh P (1987). Records of Herald Petrels and the Christmas Frigatebird from North Keeling Island, Indian Ocean. *Australian Bird Watcher* **12**, 132–133.

Stokes T, Merton D, Hicks J and Tranter J (1987). Additional records of birds from Christmas Island, Indian Ocean. *Australian Bird Watcher* **12**, 1–7.

Storer RW (1963). Courtship and mating behaviour and the phylogeny of the grebes. In *Proceedings of the 13th International Ornithological Congress* (Ed. CG Sibley) pp. 562–569. American Ornithologists' Union, Baton Rouge, Louisiana.

Storer RW (1967). The patterns of downy grebes. *Condor* **69**, 469–478.

Storer RW (1979). Order Podicipediformes. In *Check-list of Birds of the World*, Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 140–155. Museum of Comparative Zoology, Cambridge, Massachusetts.

Storer RW (1982). Fused thoracic vertebrae in birds: their occurrence and possible significance. *Journal of the Yamashina Institute of Ornithology* **14**, 86–95.

Storer RW (1987). Morphology and relationships of the Hoary-headed Grebe and the New Zealand Dabchick. *Emu* **87**, 150–158.

Storer RW (2006). The grebe-flamingo connection: A rebuttal. *Auk* **123**, 1183–1184.

Storr GM (1952). Remarks on the Streperidae. *South Australian Ornithologist* **20**, 78–80.

Storr GM (1973). List of Queensland Birds. *Western Australian Museum Special Publication*.**No. 5**. Western Australian Museum, Perth.

Storr GM (1977). Birds of the Northern Territory. *Western Australian Museum Special Publication* **No. 7**. Western Australian Museum, Perth.

Storr GM (1980). Birds of the Kimberley Division, Western Australia. *Western Australian Museum Special Publication* **No. 11**. Western Australian Museum, Perth.

Storr GM (1984). Revised List of Queensland Birds. *Records of the Western Australian Museum Supplement* **21**, 1–191.

Storr GM (1985). Birds of the Mid-eastern Interior of Western Australia. *Records of the Western Australian Museum Supplement* **22**, 1–45.

Strauch JG Jr (1978). The phylogeny of the Charadriiformes (Aves): a new estimate using the method of character compatibility analysis. *Transactions of the Zoological Society of London* **34**, 263–345.

Straw P (1999). South Island Pied Oystercatcher: First Australian record? *Tattler* **18**, 7.

Stresemann E and Amadon D (1979). Order Falconiformes. In *Check-list of Birds of the World*. Vol. 1, 2nd edn (Eds E Mayr and GW Cottrell) pp. 271–425. Museum of Comparative Zoology, Cambridge, Massachusetts.

Studer-Thiersch A (1975). Group display in *Phoenicopterus*. In *Flamingos* (Eds J Kear and N Duplaix-Hall) pp. 150–158. Poyser, Berkhamsted, UK.

Sturmbauer C, Berger B, Dallinger R and Föger M (1998). Mitochondrial phylogeny of the genus *Regulus* and implications on the evolution of breeding behaviour in sylvioid songbirds. *Molecular Phylogenetics and Evolution* **10**, 144–149.

Sutter E (1955). Uber die Mauser einiger Laufhuhnchen und die Rassen von *Turnix maculosa* and *sylvatica* im indo-australischen Gebeit. *Verhandlungen der Naturfforschenden Gesellschaft in Basel* **66**, 85–139.

Suzuki N, Laskowski M Jr and Lee YC (2004). Phylogenetic expression of Gal 1-4Gal on avian glycoproteins: glycan differentiation inscribed in the early history of modern birds. *Proceedings of the National Academy of Sciences of the United States of America* **101**, 9023–9028.

Taylor, PB (1996). Family Rallidae. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 108–209. Lynx Edicions, Barcelona.

Taylor PB (1998). *Rails*: *A Guide to the Rails, Crakes, Gallinules and Coots of the World*. Pica Press, Sussex, UK.

Tennyson AJD and Bartle JA (2005). A scientific name for fulmar prions nesting at Auckland and Heard Islands. *Notornis* **52**, 47–55.

Thiollay JM (1994). Family Accipitridae [family account] In *Handbook of the Birds of the World. Vol. 2. New World Vultures to Guineafowl*. (Eds J del Hoyo, A Elliot and J Sargatal) pp. 52–105. Lynx Edicions, Barcelona.

Thomas GH, Wills MA and Székely, T (2004a). Phylogeny of shorebirds, gulls, and alcids (Aves: Charadrii) from the cytochrome-*b* gene: parsimony, Bayesian inference, minimum evolution, and quartet puzzling. *Molecular Phylogenetics and Evolution* **30**, 516–526.

Thomas GH, Wills MA and Székely T (2004b). A supertree approach to shorebird phylogeny. *BMC Evolutionary Biology* **4** <http://www.biomedcentral.com/content/pdf/1471-2148-4-28.pdf> Accessed 04 March 2007.

Thomassen HA, Wiersema AT, de Bakker MAG, de Hetebrij E and and Povel GDE (2003). A new phylogeny of swiftlets (Aves: Apodidae) based on cytochrome-*b* DNA. *Molecular Phylogenetics and Evolution* **29**, 86–93.

Thomassen HA, den Tex R-J, de Bakker MAG and Povel GDE (2005). Phylogenetic relationships amongst swifts and swiftlets: A multi locus approach. *Molecular Phylogenetics and Evolution* **37**, 264–277.

Totterman B, Clancy G and Moffat R. (1999). First record of a South Island Pied Oystercatcher in Australia. *Australian Bird Watcher* **18**, 153–159.

Treplin S and Tiedemann R (2007) Specific chicken repeat 1 (CR1) retrotransposon insertion suggests phylogenetic affinity of rockfowls (genus *Picathartes*) to crows and ravens (Corvidae). *Molecular Phylogenetics and Evolution* **43**, 328–337.

Trewick SA (1997). Flightlessness and phylogeny amongst endemic rails (Aves: Rallidae) of the New Zealand region. *Philosophical Transactions of the Royal Society of London* B **352**, 429–446.

Turbott EG (Convener). (1990). *Checklist of the Birds of New Zealand and the Ross Dependency, Antarctica*, 3rd edn. Ornithological Society of New Zealand Incorporated and Random House Century New Zealand Limited, Auckland.

Turner A and Rose C (1989). *A Handbook to the Swallows and Martins of the World*. Christopher Helm, London.

Tyrrell K (1994). Evolutionary Genetics and Phylogeny of the Australian Pigeons and Doves (Columbidae). Honours Thesis, University of Melbourne, Melbourne, Australia.

van den Elzen R and Khoury F (1999). Systematik, phylogenetische Analyse und Biogeographie der Grossgattung *Serinus* Koch, 1816 (Aves, Carduelidae) *Courier Forschungsinstitut Senckenberg* **215**, 55–65.

van del Elzen R and Nemeschkal H-L (2001). Radiation in African canaries (Carduelidae): A comparison of different classificatory approaches. In *Acta XX Congressus Internationalis Ornithologici* (Eds BD Bell, RO Cossee, JEC Flux, BD Heather, RA Hitchmough, CJR Robertson and MJ Williams) pp. 459–467. New Zealand Ornithological Congress Trust Board, Wellington.

Van der Meij MAA, de Bakker MAG and Bout RG (2005). Phylogenetic relationships of finches and allies based on nuclear and mitochondrial DNA. *Molecular Phylogenetics and Evolution* **34**, 97–105.

van Gils J and Wiersma P (1996). Scolopacidae [species accounts]. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 488–533. Lynx Edicions, Barcelona.

van Tets GF (1976). Australasia and the origin of shags and cormorants, Phalacrocoracidae. In *Proceedings of the 16th International Ornithological Congress* (Eds HJ Frith and JH Calaby) pp. 121–124. Australian Academy of Sciences, Canberra.

van Tets GF (1977). Review of `Payne RB and Risley CJ. Systematics and evolutionary relationships among the herons (Ardeidae)'. *Emu* **77**, 156–157.

van Tets GF, Meredith CW, Fullagar PJ and Davidson PM (1988). Osteological differences between *Sula* and *Morus*, and a description of an extinct new species of *Sula* from Lord Howe and Norfolk Islands, Tasman Sea. *Notornis* **35**, 35–57.

van Tuinen M, Sibley CG and Hedges SB (1998). Phylogeny and biogeography of ratite birds inferred from DNA sequences of the mitochondrial ribosomal genes. *Molecular Biology and Evolution* **15**, 370–376.

van Tuinen M, Sibley CG and Hedges SB (2000). The early history of modern birds inferred from DNA sequences of nuclear and mitochondrial ribosomal genes. *Molecular Phylogenetics and Evolution* **17**, 451–457.

van Tuinen M, Butvill DB, Kirsch JAW and Hedges SB (2001). Convergence and divergence in the evolution of aquatic birds. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **268**, 1345–1350.

van Tuinen M, Waterhouse D and Dyke GJ (2004). Avian molecular systematics on the rebound: a fresh look at modern shorebird phylogenetic relationships. *Journal of Avian Biology* **35**, 191–194.

Vaurie C (1965). *The Birds of the Palearctic Fauna. Non-Passeriformes*. Witherby, London.

Veitch CR, Miskelly CM, Harper GA, Taylor GA and Tennyson AJD (2004). Birds of the Kermadec Islands, south-west Pacific. *Notornis* **51**, 61–90.

Veron G and Winney BJ (2000). Phylogenetic relationships within the turacos (Musophagidae). *Ibis* **142**, 446–456.

Vieillot LJP (1816). *Analyse d'une Nouvelle Ornithologie Élémentaire*. Deterville, Paris.

Voelker G (1999a). Molecular evolutionary relationships in the avian genus *Anthus* (pipits: Motacillidae). *Molecular Phylogenetics and Evolution* **11**, 84–94.

Voelker G (1999b). Dispersal, vicariance, and clocks: historical biogeography and speciation in a cosmopolitan passerine genus (*Anthus*: Motacillidae). *Evolution* **53**, 1536–1552.

Voelker G (2002). Systematics and historical biogeography of wagtails: Dispersal versus vicariance revisited. *Condor* **104**, 725–739.

Voelker G and Spellman GM (2004). Nuclear and mitochondrial DNA evidence of polyphyly in the avian superfamily Muscicapoidea. *Molecular Phylogenetics and Evolution* **30**, 386–394.

Voelker G, Rohwer S, Bowie RCK and Outlaw DC (2007). Molecular systematics of a speciose, cosmopolitan songbird genus: Defining the limits of, and relationships among, the *Turdus* thrushes. *Molecular Phylogenetics and Evolution* **42**, 422–434.

Voisin J-F (1973). Notes on the blue-eyed shags genus *Leucocarbo* Bonaparte. *Notornis* **20**, 262–271.

Voisin J-F (1978). Observations sur le comportment des Petrels géants de 1'Archipel Crozet. *Alauda* **46**, 209–234.

Voisin J-F, Voisin C, Bock WJ and Théry M (1993). Application Case 2816. *Catharacta antarctica lonnbergi* Mathews, 1912 (currently *Catharacta skua lonnbergi*; Aves, Charadriiformes): proposed conservation of the subspecific name. *Bulletin of Zoological Nomenclature* **50**, 43–51.

Voous KH (1960). *Atlas of European Birds*. Nelson, London.

Vuilleumier F, LeCroy M. and Mayr E (1992). New species of birds described from 1981–1990. *Bulletin of the british ornithologists' club*, **Centenary Supplement 112A**, 267–309.

Wagstaffe, R (1972). The status of *Oceanodroma tristrami* Salvin. *Bulletin of the British Ornithologists' Club* **92**, 27–28.

Ward D (1992). The behavioural and morphological affinities of some vanelline plovers (Vanellinae: Charadriiformes: Aves). *Journal of Zoology* **228**, 625–640.

Warham J (1974). The Fiordland Crested Penguin *Eudyptes pachyrhynchus*. *Ibis* **116**, 1–27.

Warham J (1975). The crested penguins. In *The Biology of Penguins* (Ed B Stonehouse) pp. 189–269. MacMillan Press, London.

Warham J (1990). *The Petrels, Their Ecology and Breeding Systems*. Academic Press, London.

Warheit KI, Good DA and De Queiroz K (1989). Variation in numbers of scleral ossicles and their phylogenetic transformations within the Pelecaniformes. *Auk* **106**, 383–388.

Watson DM (2005). Diagnosable versus distinct: Evaluating species limits in birds. *BioScience* **55**, 60–68.

Watson GE (1977). *Birds of the Antarctic and Sub-Antarctic*. American Geophysical Union, Washington, DC.

Watson GE and Mayr E (1986). Family Monarchidae, Monarch flycatchers, Subfamily Rhipidurinae. In *Check-list of Birds of the World*. Vol. 11 (Eds E Mayr and GW Cottrell) pp. 530–556. Museum of Comparative Zoology, Cambridge, Massachusetts.

Watson, GE, Traylor MA Jr and Mayr E (1986a). Family Sylviidae, Old World warblers. In *Check-list of Birds of the World*. Vol. 11 (Eds E Mayr and GW Cottrell) pp. 3–284. Museum of Comparative Zoology, Cambridge, Massachusetts.

Watson GE, Traylor MA Jr and Mayr E (1986b). Family Monarchidae, Monarch flycatchers, Subfamily Monarchinae. In *Check-list of Birds of the World*. Vol. 11 (Eds E Mayr and GW Cottrell) pp. 464–529. Museum of Comparative Zoology, Cambridge, Massachusetts.

Weber E (1996). Das Skelet-Muskel-System des Kieferapparates von *Aepypodius arfakianus* (Salvadori, 1877) (Aves, Megapodiidae). Eine vergleichend-anatomische Untersuchung mit Anmerkungen zu den Grundplanen der Aves und der Neognathae. *Courier Forschungsinstitut Senckenberg* **189**, 1–130.

Wetmore A (1960). A classification for the birds of the world. *Smithsonian Miscellaneous Collection* **139**, 1–37.

White CMN (1976). Comments on the Dusky Moorhen *Gallinula tenebrosa*. *Bulletin of the British Ornithologists' Club* **96**, 125–128.

White CMN and Bruce MD (1986). *The Birds of Wallacea* (*Sulawesi, The Moluccas and Lesser Sunda Islands, Indonesia*). B.O.U. Check-list No. 7. British Ornithologists' Union, Tring, UK.

White J (1790). *Journal of a Voyage to New South Wales*. Debrett, London.

Whittingham LA, Sheldon FH and Emlen ST (2000). Molecular phylogeny of jacanas and its implications for morphologic and biogeographic evolution. *Auk* **117**, 22–32.

Wieneke J and James DJ (2006). Populations of Indian Peafowl *Pavo cristatus* and Helmeted Guineafowl *Numida meleagris* in north-eastern Queensland. *Sunbird* **36**, 15–19.

Wiersma P (1996). Charadriidae [species accounts]. In *Handbook of the Birds of the World. Vol. 3. Hoatzin to Auks* (Eds J del Hoyo, A Elliot and J Sargatal) pp. 410–442. Lynx Edicions, Barcelona.

Williams TD (1995). *The Penguins*. Oxford University Press, Oxford.

Wingate DB and Watson GE (1974). First North Atlantic record of the White Tern. *Auk* **91**, 614–617.

Wink M and Heidrich P (1999). Molecular evolution and systematics of the owls (Strigiformes). In *Owls. A Guide to the Owls of the World* (Eds C König, F Weick and J-H Becking) pp. 39–57. Pica Press, Sussex, UK.

Wink M and Heidrich P (2000). Molecular systematics of owls (Strigiformes) based on DNA-sequences of mitochondrial cytochrome b gene. In *Raptors at Risk* (Eds RD Chancellor and B-U Meyburg) pp. 819–828. WWGBP & Hancock House, Berlin.

Wink M and Sauer-Gürth H (2004). Phylogenetic relationships in diurnal raptors based on nucleotide sequences of mitochondrial and nuclear gene markers. In *Raptors Worldwide* (Eds RD Chancellor and B-U Meyburg) pp. 483–498. WWGBP/MME, Budapest.

Wink M, Heidrich P and Fentzloff C (1996). A mtDNA phylogeny of sea eagles (genus *Haliaeetus*) based on nucleotide sequences of the cytochrome *b*-gene. *Biochemical Systematics and Ecology* **24**, 783–791.

Wink M, Sauer-Gürth H and Witt H-H (2004a). Phylogenetic differentiation of the Osprey *Pandion haliaetus* inferred from nucleotide sequences of the mitochondrial cytochrome *b* gene. In *Raptors Worldwide* (Eds RD Chancellor and B-U Meyburg) pp. 511–516. WWGBP/MME, Budapest.

Wink M, Sauer-Gürth H, Ellis D and Kenward R (2004b). Phylogenetic relationships in the *Hierofalco* complex (Saker-, Gyr-, Lanner-, Laggar Falcon). In *Raptors Worldwide* (Eds RD Chancellor and B-U Meyburg) pp. 499–504. WWGBP/MME, Budapest.

Wink M, Sauer-Gürth H and Fuchs M (2004c). Phylogenetic relationships in owls based on nucleotide sequences of mitochondrial and nuclear marker genes. In *Raptors Worldwide* (Eds RD Chancellor and B-U Meyburg) pp. 517–526. WWGBP/MME, Budapest.

Winkler DW and Sheldon FH (1993). Evolution of nest construction in swallows (Hirundinidae): a molecular phylogenetic perspective. *Proceedings of the National Academy of Sciences of the United States of America* **90**, 5705–5707.

Woinarski JCZ (1984). Interbreeding of the Spotted and Yellow-rumped Pardalotes *Pardalotus punctatus* and *P. xanthopygus*. *Emu* **89**, 80–86.

Wolters HE (1975–82). *Die Vogelarten der Erde*. Eine systematische Liste mit Verbreitungsangaben sowie deutschen und englischen Namen. Paul Parey, Hamburg.

Wood DS (1979). Phenetic relationships within the family Gruidae. *Wilson Bulletin* **91**, 384–399.

Wood DS (1984). Concordance between classification of the Ciconiidae based on behavioural and morphological data. *Journal für Ornithologie* **125**, 25–37.

Wood TC and Krajewski C (1996). Mitochondrial DNA sequence variation among the subspecies of Sarus Crane (*Grus antigone*). *Auk* **113**, 655–663.

Woodall PF (2001). Family Alcedinidae. In *Handbook of the Birds of the World. Vol. 6. Mousebirds to Hornbills* (Eds J del Hoyo, A Elliott and J Sargatal). pp. 130–249. Lynx Edicions, Barcelona.

Woodbury CJ (1998). Two spinal cords in birds: novel insights into early avian evolution. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **265**, 1721–1729.

Woolfenden GE (1961). Postcranial osteology of the waterfowl. *Bulletin of the Florida State Museum, Biological Sciences* **6**, 1–129.

Worthy TH and Holdaway RN (2002). *The Lost World of the Moa. Prehistoric Life in New Zealand*. Indiana University Press, Bloomington.

Worthy TH and Jouventin P (1999). The fossil avifauna of Amsterdam Island, Indian Ocean. *Smithsonian Contributions to Paleobiology* **89**, 39–65.

Worthy TH and Olson SL (2002). Relationships, adaptations, and habits of the extinct duck '*Euryanas*' *finschi*. *Notornis* **49**, 1–17.

Worthy TH, Holdaway RN, Sorenson MD and Cooper AC (1997). Description of the first complete skeleton of the extinct New Zealand goose *Cnemiornis calcitrans* Owen, (Aves: Anatidae), and a reassessment of the relationships of *Cnemiornis*. *Journal of Zoology, London* **243**, 695–723.

Yuri T and Mindell DP (2002). Molecular phylogenetic analysis of Fringillidae, 'New World nine-primaried oscines' (Aves: Passeriformes). *Molecular Phylogenetics and Evolution* **23**, 229–243.

Zelenitsky DK and Modesto SP (2003). New information on the eggshell of ratites (Aves) and its phylogenetic implications. Canadian *Journal of Zoology* **81**, 962–970.

Zhang B-W, Chang Q, Zhu L-F and Wei F-W (2004). Phylogeny of Botaurinae and classification of Black Bittern based on analyses of mitochondrial cytochrome *b* gene. *Chinese Journal of Zoology* **39**, 105–108.

Zimmer R, Erdtmann B, Thomas WK and Quinn TW (1994). Phylogenetic analysis of the *Coscoroba coscoroba* using mitochondrial srRNA gene sequences. *Molecular Phylogenetics and Evolution* **3**, 85–91.

Zink RM (2002). A new perspective on the evolutionary history of Darwin's finches. *Auk* **119**, 864–871.

Zink RM (2004). The role of subspecies in obscuring biological diversity and misleading conservation policy. *Proceedings of the Royal Society of London, Series B, Biological Sciences* **271**, 561–564.

Zink RM and McKitrick MC (1995). The debate over species concepts and its implications for ornithology. *Auk* **112**, 701–719.

Zink RM, Rohwer S, Andreev AV and Dittmann DL (1995). Trans-Beringia comparisons of mitochondrial DNA differentiation in birds. *Condor* **97**, 639–649.

Zonfrillo B (1988). Notes and comments on the taxonomy of Jouanin's Petrel *Bulweria fallax* and Bulwer's Petrel *Bulweria bulweri*. *Bulletin of the British Ornithologists' Club* **108**, 71–75.

Zuccon D, Cibois A, Pasquet E and Ericson PGP (2006). Nuclear and mitochondrial sequence data reveal the major lineages of starlings, mynas and related taxa. *Molecular Phylogenetics and Evolution* **41**, 333–344.

Zusi RL and Livezey BC (2000). Homology and phylogenetic implications of some enigmatic cranial features in galliform and anseriform birds. *Annals of the Carnegie Museum* **69**, 157–193.

Index