

Genera of Birds

(Biological Classification)

Brody Gaffney

First Edition, 2012

ISBN 978-81-323-4143-7

© All rights reserved.

Published by:

White Word Publications

4735/22 Prakashdeep Bldg,

Ansari Road, Darya Ganj,

Delhi - 110002

Email: info@wtbooks.com

Table of Contents

Chapter 1 - Falcon

Chapter 2 - Avocet and Aburria

Chapter 3 - Acanthiza and Accentor

Chapter 4 - Accipiter and Acridotheres

Chapter 5 - Pink-Legged Graveteiro

Chapter 6 - Acrocephalus and Aechmophorus

Chapter 7 - Aerodramus

Chapter 8 - Aethia

Chapter 9 - Amazilia and Amazon Parrot

Chapter 10 - Anas

Chapter 11 - Anodorhynchus and Anser (Bird)

Chapter 12 - Aphelocoma

Chapter 13 - Apostlebird

Chapter 14 - Kiwi

Chapter 15 - Ara (Genus)

Chapter 1

Falcon

Falcon



Brown Falcon (*Falco berigora*)

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Falconiformes
Family:	Falconidae
Subfamily:	Falconinae
Genus:	<i>Falco</i> Linnaeus, 1758

Synonyms

- *Aesalon*
- *Lithofalco*
- *Tinnunculus* Linnaeus, 1766
- *Hierofalco* Cuvier, 1817
- *Cerchneis* Boie, 1826
- *Hypotriorchis* Boie, 1826
- *Rhynchodon* Nitzsch, 1829
- *Ieracidea* Gould, 1838
- *Hieracidea* Strickland, 1841
(unjustified emendation)
- *Gennaia* Kaup, 1847
- *Jerafalco* Kaup, 1850
(unjustified emendation)
- *Harpe* Bonaparte, 1855 (*non*
Lacepède 1802: preoccupied)
- *Dissodectes* Sclater, 1864
- *Genaïe* Heuglin, 1867
(unjustified emendation)
- *Harpa* Sharpe, 1874 (*non*
Pallas 1774: preoccupied)
- *Gennadas* Heine &
Reichenow, 1890 (unjustified
emendation)
- *Nesierax* Oberholser, 1899
- *Nesihierax* Dubois, 1902
(unjustified emendation)
- *Asturaetus* De Vis, 1906 (*non*
Asturaetos Brehm 1855:
preoccupied)
- *Plioaetus* Richmond, 1908
- *Sushkinia* Tugarinov, 1935

A **falcon** is any species of raptor in the genus *Falco*. The genus contains 37 species, widely distributed throughout Europe, Asia, and North America.

Adult falcons have thin tapered wings, which enable them to fly at high speed and to change direction rapidly. Fledgling falcons, in their first year of flying, have longer flight feathers which makes their configuration more like that of a general-purpose bird such as a broadwing. This makes it easier to fly while learning the exceptional skills required to be effective hunters as adults.

Peregrine Falcons have been recorded diving at speeds of 200 miles per hour (320 km/h), making them the fastest-moving creatures on Earth. Other falcons include the Gyrfalcon, Lanner Falcon, and the Merlin. Some small falcons with long narrow wings are called hobbies, and some which hover while hunting are called kestrels. The falcons are part of the family Falconidae, which also includes the caracaras, Laughing Falcon, forest falcons, and falconets.

The traditional term for a male falcon is *tercel* (British spelling) or *tiercel* (American spelling), from Latin *tertius* = third because of the belief that only one in three eggs hatched a male bird. Some sources give the etymology as deriving from the fact that a male falcon is approximately one third smaller than the female (Old French *tiercelet*).

A falcon chick, especially one reared for falconry, that is still in its downy stage is known as an *eyas* (sometimes spelt *eyass*). The word arose by mistaken division of Old French *un niais*, from Latin presumed *nidiscus* ("nestling", from *nidus* = nest). The technique of hunting with trained captive birds of prey is known as falconry.

As is the case with many birds of prey, falcons have exceptional powers of vision; one species has a visual acuity of 2.6 times that of a normal human.

In February 2005, the Canadian ornithologist Louis Lefebvre announced a method of measuring avian intelligence in terms of a bird's innovation in feeding habits. The falcon and corvids scored highest on this scale.

Systematics and evolution

Compared to other birds of prey, the fossil record of the falcons is not well distributed in time. The oldest fossils tentatively assigned to this genus are from the Late Miocene, less than 10 million years ago. This coincides with a period in which many modern genera of birds became recognizable in the fossil record. The falcon lineage may however be somewhat older than this and given the distribution of fossil and living *Falco* taxa is probably of North American, African or possibly Middle Eastern or European in origin.

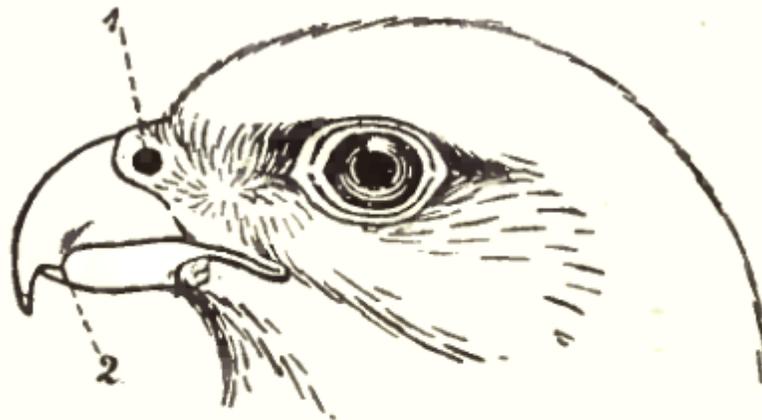
Falcons are roughly divisible into three or four groups. The first contains the kestrels (probably excepting the American Kestrel); usually small and stocky falcons of mainly brown upperside color and sometimes sexually dimorphic; three African species that are generally grey in colour stand apart from the typical members of this group. Kestrels feed chiefly on terrestrial vertebrates and invertebrates of appropriate size, such as rodents, reptiles, or insects.

The second group contains slightly larger (on average) and more elegant species, the hobbies and relatives. These birds are characterized by considerable amounts of dark slate-grey in their plumage; the malar area is nearly always black. They feed mainly on smaller birds.

Third are the Peregrine Falcon and its relatives: large powerful birds which also have a black malar area (except some very light color morphs), and often a black cap also. Otherwise, they are somewhat intermediate between the other groups, being chiefly medium grey with some lighter or brownish colours on the upper side. They are on average more delicately patterned than the hobbies and if the hierofalcons are excluded (see below), this group contains typically species with horizontal barring on the underside. As opposed to the other groups, where tail colour varies much in general but little according to evolutionary relatedness, the tails of the large falcons are quite

uniformly dark grey with rather inconspicuous black banding and small white tips, though this is probably plesiomorphic. These large *Falco* feed on mid-sized birds and terrestrial vertebrates.

Very similar to these and sometimes included therein are the 4 or so species of hierofalcons (literally, "hawk-falcons"). They represent taxa with usually more phaeomelanins which impart reddish or brown colours, and generally more strongly patterned plumage reminiscent of hawks. Notably, their undersides have a lengthwise pattern of blotches, lines or arrowhead marks. While these three or four groups, loosely circumscribed, are an informal arrangement, they probably contain several distinct clades in their entirety. A study of mtDNA cytochrome *b* sequence data of some kestrels (Groombridge *et al.* 2002) identified a clade containing the Common Kestrel and related "malar-striped" species, to the exclusion of such taxa as the Greater Kestrel (which lacks a malar stripe), the Lesser Kestrel (which is very similar to the Common but also has no malar stripe), and the American Kestrel. The latter species has a malar stripe, but its color pattern—apart from the brownish back—and notably also the black feathers behind the ear, which never occur in the true kestrels, are more reminiscent of some hobbies. The malar-striped kestrels apparently split from their relatives in the Gelasian, roughly 2.5-2 mya, and are apparently of tropical East African origin. The entire "true kestrel" group—excluding the American species—is probably a distinct and quite young clade, as also suggested by their numerous apomorphies.



Head of a Falcon (*Hierofalco islandus*)
to show impervious nostrils,
and tooth-like process of the bill.

Most members of the genus *Falco* show a *tooth* on the upper mandible

Other studies have confirmed that the hierofalcons are a monophyletic group—and, incidentally, that hybridization is quite frequent at least in the larger species falcon

species. Initial studies of mtDNA cytochrome *b* sequence data suggested that the hierofalcons are basal among living falcons. This is now known to be an erroneous result due to the presence of a numt (Wink & Sauer-Gürth 2000); in reality the hierofalcons are a rather young group, originating maybe at the same time as the start of the main kestrel radiation, about 2 million years ago. This lineage seems to have gone nearly extinct at some point in the past; the present diversity is of very recent origin, though little is known about their fossil history (Nittinger *et al.* 2005, Johnson *et al.* 2007).

The phylogeny and delimitations of the Peregrine and hobbies groups is more problematic. Molecular studies have only been conducted on a few species, and namely the morphologically ambiguous taxa have often been little researched. The morphology of the syrinx, which contributes well to resolving the overall phylogeny of the Falconidae, is not very informative in the present genus. Nonetheless, a core group containing the Peregrine and Barbary falcons which in turn group with the hierofalcons and the more distant Prairie Falcon (which was sometimes placed with the hierofalcons, even though it is entirely distinct biogeographically), as well as at least most of the "typical" hobbies, are confirmed to be monophyletic as suspected.

Given that the American *Falcos* of today belong to the Peregrine group or are apparently more basal species, it seems that the initially most successful evolutionary radiation was an Holarctic one that originated possibly around central Eurasia or in (northern) Africa. One or several lineages were present in North America by the Early Pliocene at latest.

The origin of today's major *Falco* groups—the "typical" hobbies and kestrels for example, or the Peregrine-hierofalcon complex, or the Aplomado Falcon lineage—can be quite confidently placed from the Miocene-Pliocene boundary through the Zanclean and Piacenzian and just into the Gelasian, that is from about 8 to 2.4 million years ago, when the malar-striped kestrels diversified. Some groups of falcons, such as the hierofalcon complex or the Peregrine-Barbary superspecies have only evolved in more recent times; the species of the former seem to be a mere 120,000 years old or so (Nittinger *et al.* 2005).

Species



Common Kestrel



New Zealand Falcon



Saker Falcon, a typical hierofalcon

The sequence follows the taxonomic order of White *et al.* (1996), except for adjustments in the kestrel sequence.

- Madagascar Kestrel, *Falco newtoni*
- Seychelles Kestrel, *Falco araea*
- Mauritius Kestrel, *Falco punctatus*
- Réunion Kestrel, *Falco duboisi* - extinct (c.1700)
- Spotted Kestrel, *Falco moluccensis*
- Nankeen Kestrel or Australian Kestrel, *Falco cenchroides*
- Common Kestrel, *Falco tinnunculus*
 - Rock Kestrel, *Falco (tinnunculus) rupicolus*

- Greater Kestrel, *Falco rupicoloides*
- Fox Kestrel, *Falco alopex*
- Lesser Kestrel, *Falco naumanni*
- Grey Kestrel, *Falco ardosiaceus*
- Dickinson's Kestrel, *Falco dickinsoni*
- Banded Kestrel, *Falco zoniventris*
- Red-necked Falcon, *Falco chicquera*
 - African Red-necked Falcon, *Falco (chicquera) ruficollis*
- Red-footed Falcon, *Falco vespertinus*
- Amur Falcon, *Falco amurensis*
- Eleonora's Falcon, *Falco eleonora*
- Sooty Falcon, *Falco concolor*
- American Kestrel or "Sparrow Hawk", *Falco sparverius*
- Aplomado Falcon, *Falco femoralis*
- (American) Merlin or "Pigeon Hawk", *Falco columbarius*
 - Eurasian Merlin, *Falco (columbarius) aesalon*
- Bat Falcon, *Falco rufifularis*
- Orange-breasted Falcon, *Falco deiroleucus*
- Eurasian Hobby, *Falco subbuteo*
- African Hobby, *Falco cuvierii*
- Oriental Hobby, *Falco severus*
- Australian Hobby or Little Falcon, *Falco longipennis*
- New Zealand Falcon, *Falco novaeseelandiae*
- Brown Falcon, *Falco berigora*
- Grey Falcon, *Falco hypoleucos*
- Black Falcon, *Falco subniger*
- Lanner Falcon, *Falco biarmicus*
- Laggard Falcon, *Falco jugger*
- Saker Falcon, *Falco cherrug*
 - Altai Falcon, *Falco cherrug altaicus* (status unclear)
- Gyrfalcon, *Falco rusticolus*
- Prairie Falcon, *Falco mexicanus*
- Peregrine Falcon, *Falco peregrinus*
 - Peale's Falcon, *Falco peregrinus pealei*
 - Pallid Falcon, *Falco peregrinus cassini* var. *kreyenborgi*
 - Barbary Falcon, *Falco (peregrinus) pelegrinoides*
- Taita Falcon, *Falco fasciinucha*

Fossil record

- *Falco medius* (Late Miocene of Cherevichnyi, Ukraine)
- ?*Falco* sp. (Late Miocene of Idaho)
- *Falco* sp. (Early Pliocene of Kansas)
- *Falco* sp. (Early Pliocene of Bulgaria - Early Pleistocene of Spain and Czechia)
- *Falco oregonus* (Early/Middle Pliocene of Fossil Lake, Oregon) - possibly not distinct from a living species

- *Falco umanskajae* (Late Pliocene of Kryzhanovka, Ukraine) - includes "Falco odessanus", a *nomen nudum*
- ?*Falco bakalovi* (Late Pliocene of Varshets, Bulgaria)
- *Falco antiquus* (Middle Pleistocene of Noailles, France and possibly Horvölgy, Hungary)
- Cuban Kestrel, *Falco kurochkini* (Late Pleistocene/Holocene of Cuba, West Indies)
- *Falco chowi* (China)

"Sushkinia" pliocaena from the Early Pliocene of Pavlodar (Kazakhstan) appears to be a falcon of some sort. It might belong into this genus or a closely related one (Becker 1987). In any case, the genus name *Sushkinia* is invalid for this animal because it had already been allocated to a prehistoric dragonfly relative.

The supposed "*Falco*" *pisanus* was actually a pigeon of the genus *Columba*, possibly the same as *Columba omnisanctorum* which in that case would adopt the older species name of the "falcon" (Mlíkovský 2002). The Eocene fossil "*Falco*" *falconellus* (or "*F.*" *falconella*) from Wyoming is a bird of uncertain affiliations, maybe a falconid, maybe not; it certainly does not belong into this genus. "*Falco*" *readei* is now considered a paleosubspecies of the Yellow-headed Caracara (*Milvago chimachima*).

Chapter 2

Avocet and Aburria

Avocet

Avocets



Pied Avocet
(*Recurvirostra avosetta*)

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Charadriiformes
Family:	Recurvirostridae
Genus:	<i>Recurvirostra</i> Linnaeus, 1758

Species

- *Recurvirostra avosetta*
- *Recurvirostra americana*
- *Recurvirostra novaehollandiae*
- *Recurvirostra andina*

The four species of **Avocets** are a genus, *Recurvirostra*, of waders in the same avian family as the stilts.



American Avocet Quintana, TX

Avocets have long legs and long, thin, upcurved bills (giving their scientific name

Recurvirostra) which they sweep from side to side when feeding in the brackish or saline wetlands they prefer. The plumage is pied, sometimes also with some red.

Members of this species have webbed feet and readily swim. Their diet consists of aquatic insects and other small creatures. They nest on the ground in loose colonies. In estuarine settings they may feed on exposed bay muds or mudflats.

The Pied Avocet is the emblem of the Royal Society for the Protection of Birds.

The four species, all in the genus *Recurvirostra*, are:

- Pied Avocet, *Recurvirostra avosetta*
- American Avocet, *Recurvirostra americana*
- Red-necked Avocet, *Recurvirostra novaehollandiae*
- Andean Avocet, *Recurvirostra andina*

In a large colony they are aggressively defensive and chase off any other species of birds that try to nest among or near them. That causes the annoyed remark "*Avocet : Exocet*" from some British birdwatchers.

They had been extinct in Britain for a long time because of land reclamation of their habitat and persecution by skin and egg collectors, but during or soon after World War II started breeding on reclaimed land near the Wash which was returned to salt marsh to make difficulties for any landing German invaders.

Aburria

Piping-guans



A Blue-throated Piping-guan.

Scientific classification

Kingdom: Animalia
Phylum: Chordata
Class: Aves
Order: Galliformes
Family: Cracidae
Genus: *Aburria*
Reichenbach, 1853

Species

Aburria aburri
Aburria kujubi
Aburria cumanensis
Aburria jacutinga
Aburria pipile

Synonyms

Pipile Bonaparte, 1856

Aburria are the **piping-guans**, a bird genus in the Cracidae family. Most species were formerly classified in *Pipile*, but a recent study (Grau *et al.* 2005), evaluating mtDNA, osteology and biogeography data (Grau *et al.*, 2005) concluding that the Wattled Guan belongs in the same genus as these and is a hypermelanistic piping-guan. Thus, *Pipile* became a junior synonym of *Aburria*, though this conclusion was not accepted by the South American Checklist Committee (Remsen *et al.*, 2007).

The same results also showed that the light-faced taxa *pipile*, *cumanensis* and *kujubi* are not, as was sometimes suggested, conspecific. However, free interbreeding between *A. kujubi* and *A. cumanensis grayi* in eastern Bolivia, creating a "hybrid swarm", casts doubt on this conclusion for the two species named (Remsen *et al.*, 2007, citing del Hoyo and Motis, 2004).

It was possible to confidently resolve that the white-faced species form a clade, whereas the more basal black-faced forms are of less certain relationship. Possibly, the Black-fronted Piping-guan is the basalmost taxon, but the placement of the Wattled Piping-guan in regard to its congeners is not all too well resolved. Blue wattles evolved only once, in a lineage which seems to have originated north of the Amazon River. The piping-guans' radiation began in the latter half of the Early Pliocene, roughly 4-3.5 mya. The white-faced lineage emerged around 3 mya and its present diversity began to evolve around the Pliocene-Pleistocene boundary, when the ancestors of the Red-throated Piping-guan and the blue-wattled taxa split. Due to not being calibrated by material evidence such as fossils, the divergence times cannot be estimated with a high confidence (Grau *et al.* 2005).

The origin of the genus was possibly in the general area of eastern Bolivia, at the very margin of its current range. From the phylogeny outlined above, the piping-guans would be expected to have originated in the southern Brazilian lowlands. However, although the

relationships of the genera of guans are not entirely clear, it seems most likely that the group originated in the northern Andes region: The northernmost guan genera *Chamaepetes* and *Penelopina* appear to be basal divergences, and *Aburria* is most likely closer to *Penelope* (which represents a generally southward radiation out of the northern Andes) than to these.

Thus it appears most likely that the present genus diverged in the eastern foothills of the Andes somewhere in the vicinity of Bolivia, far to the northwest from where its origin would be presumed from the phylogeny and present-day distribution of *Aburria* alone (Pereira *et al.* 2002, Grau *et al.* 2005). Two considerations are worthy of note: First, the time at which the ancestor of the piping-guans diverged from *Penelope* has been roughly dated to the Burdigalian, some 20-15 mya, which leaves a considerable gap during which no surviving piping-guan lineage evolved (Pereira *et al.* 2002). Secondly, it is notable that in the Late Pliocene, rising sea levels transformed much of the South American lowlands into brackish lagoon habitat unsuitable for piping-guans. Thus, the present distribution is apparently a relict, and extinction of populations/displacement by the more resilient *Penelope* guans seems to have played as much or possibly more of a role in shaping the diversity of piping-guans of our time than emergence of new lineages (Grau *et al.* 2005).

Species

- Black-fronted Piping-guan, *Aburria jacutinga*
- Wattled Piping-guan, *Aburria aburri*
- Red-throated Piping-guan, *Aburria kujubi*
- Trinidad Piping-guan, *Aburria pipile*
- Blue-throated Piping-guan, *Aburria cumanensis*
 - Gray's Piping-guan, *Aburria cumanensis grayi*

Chapter 3

Acanthiza and Accentor

Acanthiza



Yellow Thornbill

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Passeriformes
Family:	Acanthizidae
	<i>Acanthiza</i>
Genus:	Vigors & Horsfield, 1827

Acanthiza is a genus of passeriform birds, mostly found in Australia but with one species (*A. murina*) restricted to New Guinea. These birds are commonly known as **thornbills**. They are not closely related to species in the hummingbird genus *Chalcostigma* which are also called thornbills.

They are found primarily in Australia and have a thin long beak. Colloquially the thornbill is sometimes referred to as a Tit by locals, but in reality the Australian continent lacks any real Tits, albeit Acanthizan species do show some similarities with Tits in their behaviour. This is expressed in the fact that, like Tits, Thornbills live in small groups, except for the period of reproduction, during which the couples isolate themselves to raise their young.

The habitat preferences of the group vary from dense forest to open saltbush and bluebush plains.

Acanthiza follow a very characteristic undulating path when flying. Their diet is formed essentially of little insects and plant lice that these birds glean from foliage. They are also exceptional acrobats that are easily able to stay head downward like tits do.

The nest of the *Acanthiza* is a large dome-shaped construction, completely enclosed except for a side hole, just like that of the long-tailed tit; however *Acanthiza* adds to it an additional room whose function is unknown.

The incubation period is unknown but the number of eggs usually ranges from 2 to 4. The length of an adult bird is 8 - 10 centimeters.

Species

- Inland Thornbill, *Acanthiza apicalis*
- Yellow-rumped Thornbill, *Acanthiza chrysorrhoa*
- Tasmanian Thornbill, *Acanthiza ewingii*
- Western Thornbill, *Acanthiza inornata*
- Slender-billed Thornbill, *Acanthiza iredalei*
- Mountain Thornbill, *Acanthiza katherina*
- Striated Thornbill, *Acanthiza lineata*
- Papuan Thornbill, *Acanthiza murina*
- Yellow Thornbill, *Acanthiza nana*
- Brown Thornbill, *Acanthiza pusilla*
- Buff-rumped Thornbill, *Acanthiza reguloides*
- Slaty-backed Thornbill, *Acanthiza robustirostris*
- Chestnut-rumped Thornbill, *Acanthiza uropygialis*

Accentor

Accentor



Dunnock (*Prunella modularis*)

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Passeriformes
Suborder:	Passeri
Family:	Prunellidae Richmond, 1908
Genus:	<i>Prunella</i> Vieillot, 1816

The **accentors** are in the only bird family, the **Prunellidae**, which is completely endemic to the Palearctic. This small group of closely related passerines are all in a single genus *Prunella*. All but the Dunnock and the Japanese Accentor are inhabitants of the mountainous regions of Europe and Asia; these two also occur in lowland areas, as does the Siberian Accentor in the far north of Siberia. This genus is not strongly migratory, but they will leave the coldest parts of their range in winter, and make altitudinal movements.

These are small, fairly drab species superficially similar, but unrelated to, sparrows; they are generally regarded as being related to the thrushes or the warblers. They are 14 to 18 centimetres in length, and weigh between 25 and 35 grams. However, accentors have thin sharp bills, reflecting their diet of ground-dwelling insects in summer, augmented with seeds and berries in winter. They may also swallow grit and sand to help their stomach break up these seeds.

Their typical habitat is mountainous regions in an area far above the tree-line, but below the snow-line. The Himalayan accentor can be found as high as 17,000 ft above sea level when breeding, however, most accentors breed in scrub vegetation at lower levels. Most species migrate downwards to spend the winter, with only some being hardy enough to

remain. Accentors spend the majority of their time in the undergrowth and even when flushed, stay low to the ground until reaching cover.

Most of the species live together in flocks, like other members of Prunellidae. The dunnock is an exception since it prefers to be solitary except when feeding. The dunnock also earned a nickname of "shuffle-wing" since it most strongly displays the characteristic wing flicks used during courtship and other displays.

Accentors may have two to three broods a year. Courtship consists of a great deal of song from the males, which may include short lark-like song flights to attract a mate. In most species, the male and female share in the nest making, with the dunnocks again being an exception - their males have no part in nest building or incubation. They build neat cup nests and lay about 4 unspotted green or blue eggs. The eggs are incubated for around 12 days. The young are fed by both parents and take an additional 12 days or so to fledge.

Species list

FAMILY: PRUNELLIDAE

- **Genus: *Prunella***
 - Alpine Accentor, *Prunella collaris*
 - Altai Accentor, *Prunella himalayana*
 - Robin Accentor, *Prunella rubeculoides*
 - Rufous-breasted Accentor, *Prunella strophiiata*
 - Siberian Accentor, *Prunella montanella*
 - Brown Accentor, *Prunella fulvescens*
 - Radde's Accentor, *Prunella ocularis*
 - Black-throated Accentor, *Prunella atrogularis*
 - Koslow's Accentor, *Prunella koslowi*
 - Dunnock, Hedge Accentor or Hedge Sparrow, *Prunella modularis*
 - Japanese Accentor, *Prunella rubida*
 - Maroon-backed Accentor, *Prunella immaculata*
 - Yemen Accentor, *Prunella fagani*

Harrison used the group name **Dunnock** for all of the species, not just *Prunella modularis* (thus e.g. **Japanese Dunnock** for *P. rubida*); this usage has much to be said for it, based as it is on the oldest known name for any of the species (old English *dun-*, brown, + *-ock*, small bird: "little brown bird"), and a much more euphonious name than the contrived "Accentor". *Accentor* was the scientific name for the Alpine Accentor (*Accentor collaris*). It comes from Late Latin, meaning "sing with another" (ad + cantor).

Chapter 4

Accipiter and Acridotheres

Accipiter

Accipiter



Collared Sparrowhawk (*A. cirrocephalus*),
Kobble Creek (Queensland, Australia)

Scientific classification

Kingdom: Animalia
Phylum: Chordata
Class: Aves
Subclass: Neornithes
Infraclass: Neognathae
Superorder: Neoaves
Order: Falconiformes
Family: Accipitridae
Subfamily: Accipitrinae

Genus: *Accipiter*
Brisson, 1760

Diversity

About 50 species

Synonyms

Hieraspiza Kaup, 1844

The genus *Accipiter* is a group of birds of prey in the family Accipitridae, many of which are named as goshawks and sparrowhawks. They can be anatomically distinguished from their relatives by the lack of a procoracoid foramen. Two small and aberrant species usually placed here do possess a large procoracoid foramen and are also distinct as regards DNA sequence. They may warrant separation in the old genus *Hieraspiza*.

These birds are slender with short broad rounded wings and a long tail which helps them manoeuvre in flight. They have long legs and long sharp talons used to kill their prey, and a sharp hooked bill used in feeding. Females tend to be larger than males. They often ambush their prey, mainly small birds and mammals, capturing it after a short chase. The typical flight pattern is a series of flaps followed by a short glide. They are commonly found in wooded or shrubby areas.

Species in taxonomic order

- Northern Goshawk, *Accipiter gentilis*
- Eurasian Sparrowhawk, *Accipiter nisus*
- Grey-bellied Goshawk, *Accipiter poliogaster*
- Crested Goshawk, *Accipiter trivirgatus*
- Sulawesi Goshawk, *Accipiter griseiceps*
- Red-chested Goshawk, *Accipiter toussenelii*
- African Goshawk, *Accipiter tachiro*
- Chinese Goshawk, *Accipiter soloensis*
- Frances's Sparrowhawk, *Accipiter francesiae*
 - Anjouan Island Sparrowhawk, *Accipiter francesiae pusillus*
- Spot-tailed Goshawk, *Accipiter trinitatus*
- Grey Goshawk, *Accipiter novaehollandiae*
- Brown Goshawk, *Accipiter fasciatus*
 - Christmas Island Goshawk, *Accipiter (fasciatus) natalis*
- Black-mantled Goshawk, *Accipiter melanochlamys*
- Pied Goshawk, *Accipiter albogularis*
- Fiji Goshawk, *Accipiter rufitorques*
- White-bellied Goshawk, *Accipiter haplochrous*
- Moluccan Goshawk, *Accipiter henicogrammus*
- Grey-headed Goshawk, *Accipiter poliocephalus*
- New Britain Goshawk, *Accipiter princeps*
- Black Goshawk, *Accipiter melanoleucus*
- Henst's Goshawk, *Accipiter henstii*

- Meyer's Goshawk, *Accipiter meyerianus*
- Chestnut-flanked Sparrowhawk, *Accipiter castanius*



Shikra (*A. badius*) with a garden lizard (*Calotes* sp.) in Hyderabad, India



Brown Goshawk (*A. fasciatus*), Kurwongbah (Queensland, Australia)

- Nicobar Sparrowhawk, *Accipiter butleri*
- Levant Sparrowhawk, *Accipiter brevipes*
- Slaty-mantled Sparrowhawk, *Accipiter luteoschistaceus*
- Imitator Sparrowhawk, *Accipiter imitator*
- Red-thighed Sparrowhawk, *Accipiter erythropus*
- Little Sparrowhawk, *Accipiter minullus*
- Japanese Sparrowhawk, *Accipiter gularis*
- Small Sparrowhawk, *Accipiter nanus*
- Rufous-necked Sparrowhawk, *Accipiter erythrauchen*
- Collared Sparrowhawk, *Accipiter cirrocephalus*
- New Britain Sparrowhawk, *Accipiter brachyurus*

- Vinous-breasted Sparrowhawk, *Accipiter rhodogaster*
- Madagascar Sparrowhawk, *Accipiter madagascariensis*
- Ovampo Sparrowhawk, *Accipiter ovampensis*
- Rufous-chested Sparrowhawk, *Accipiter rufiventris*
- Shikra, *Accipiter badius*
- Tiny Hawk, *Accipiter superciliosus* – may belong in *Hieraspiza*
- Semicollared Hawk, *Accipiter collaris* – may belong in *Hieraspiza*
- Sharp-shinned Hawk, *Accipiter striatus*
- White-breasted Hawk, *Accipiter chionogaster*
- Plain-breasted Hawk, *Accipiter ventralis*
- Rufous-thighed Hawk, *Accipiter erythronemius*
- Cooper's Hawk, *Accipiter cooperii*
- Gundlach's Hawk, *Accipiter gundlachi*
- Bicoloured Hawk, *Accipiter bicolor*
 - Chilean Hawk, *Accipiter (bicolor) chilensis*
- Besra, *Accipiter virgatus*

An *Accipiter* was seen on 12 March 1994 south of the summit of Camiguin in the Philippines, where the genus was not known to occur. It may have been an undescribed taxon, but more likely it was not; it could simply have been a vagrant of a known species.

Acridotheres

Acridotheres



Common Myna, *Acridotheres tristis*

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Passeriformes
Family:	Sturnidae

Genus: *Acridotheres*
Vieillot, 1816

Acridotheres is a genus of starlings, the "typical" **mynas**, which are tropical members of the family Sturnidae. This genus has representatives in tropical southern Asia from Iran east to southern China and Indonesia. Two species have been introduced widely elsewhere. The Common Myna has been introduced to South Africa, Israel, Hawaii, North America, Australia and New Zealand, and the Crested Myna to the Vancouver region of British Columbia.

The *Acridotheres* mynas are generally dark or dull birds with and fluted calls like most starlings; the sexes are similar. They walk rather than hop, and have modifications to the skull and its muscles for open bill probing. They resemble the hill mynas (*Gracula*) with which they often co-occur, in having large white or buff wing patches which are obvious in flight and in some also naked areas on the head, but differ in that only the head plumage is glossy, and the underparts tend to be paler. The naked head patches are different in arrangement. *Acridotheres* mynas are also much more terrestrial than *Gracula*.

They have bowing courtship displays, whereas *Gracula* has no visual display. They lay unmarked pale blue eggs.

Several species have frontal crests which become covered with pollen when the birds take nectar from flowers, and may play a role in pollination.

Like most starlings, the *Acridotheres* mynas are fairly omnivorous, eating fruit, nectar and insects.

Systematics

Despite being both called "mynas", the *Acridotheres* mynas are closer related to a group of mainly terrestrial starlings from Eurasia, such as the Common Starling, and also African ones like the *Lamprotornis* glossy-starlings. Among these, they are among the larger and duller species; they seem to be one of the major groups to evolve most recently. Apparently, they all arose from ancestors which arrived from Central Asia and adapted to more humid conditions in the Tropics. They presumably were isolated in about their current range when the evolutionary radiation to which they belonged - including the Wattled Starling and the *Sturnia* species - was fragmented by desertification of their of origin at the start of the Early Pliocene, as Earth turned towards the last ice age 5 million years ago.

The taxonomy of this group is complex, and other authorities differ considerably in which species they place in this genus, and in the species boundaries within *Acridotheres*.

The following is a list of "core" *Acridotheres* species in taxonomic order:

- White-vented Myna, *Acridotheres grandis*
- Crested Myna, *Acridotheres cristatellus*
- Javan Myna, *Acridotheres javanicus*
- Pale-bellied Myna, *Acridotheres cinereus*
- Jungle Myna, *Acridotheres fuscus*
- Collared Myna, *Acridotheres albocinctus*
- Bank Myna, *Acridotheres ginginianus*
- Common Myna, *Acridotheres tristis*

The taxonomy of this group is complex, and other authorities differ considerably in which species they place in this genus, and in the species boundaries within *Acridotheres*. Several species from the paraphyletic *Sturnus* assemblage are often placed in *Acridotheres*. Indeed, as more recent studies suggest (Jønsson & Fjeldså 2006, Zuccon et al. 2006), this is most likely correct.

- Vinous-breasted Starling, *Sturnus burmannicus* - alternatively united in *Gracupica* with Black-collared Starling
- Asian Pied Starling, *Sturnus contra*
- Black-winged Starling, *Sturnus melanopterus*
- Red-billed Starling, *Sturnus sericeus*
- White-cheeked Starling, *Sturnus cineraceus*

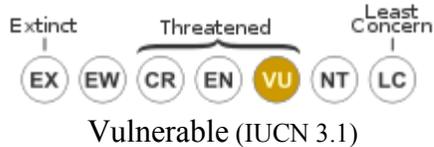
The last two are probably rather basal in the entire group and might even be closer to *Sturnia*. The relationships of the White-faced Starling are more unclear, but it is generally not held to be close to the present genus.

Chapter 5

Pink-Legged Graveteiro

Pink-legged Graveteiro

Conservation status



Scientific classification

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Passeriformes

Family: Furnariidae

Acrobatornis

Genus: Pacheco, B.M. Whitney & Gonzaga, 1996

Species: *A. fonsecai*

Binomial name

Acrobatornis fonsecai

Pacheco, B.M. Whitney & Gonzaga,
1996

The **Pink-legged Graveteiro** (*Acrobatornis fonsecai*) is a species of bird in the Furnariidae family that is endemic to Brazil (Pacheco 1996). More specifically the Atlantic Forest located in the southeast part of Brazil, thriving in the cocoa plantations (Pacheco 1996). As of 2000 the Pink-legged Graveteiro is listed as a vulnerable species (Birdlife International 2004). The estimated population of the Pink-legged Graveteiro is between 2,500 and 9,999 individuals left in the wild (Birdlife International 2007). Its main habitat is cocoa plantations which are now being wiped out, leaving the Pink-legged Graveteiro with no where to go (Pacheco 1996). Since this rare bird is only found

in this one location on earth there needs to be conservation steps implemented to ensure its survival. It is the only member of the genus *Acrobatornis*.

Description

The Pink-legged Graveteiro's most distinctive feature is, as the name suggests, its bright-pink legs and feet (Pacheco 1996). The plumage, as an adult, is mainly black and gray (Pacheco 1996). As juveniles they are commonly more brown in color (Birdlife International 2007). Its size is comparable to that of a warbler, and is thought to be stout for a bird its size (Line 1996). A more specific measurement of the bird is about 14 cm as an adult (Birdlife International 2007). One way to tell you have found a Pink-legged Graveteiro is by its unique song. The song is usually high-pitched and begins with sparse notes, then it accelerates, and finally finishes with a long trill (Birdlife International 2007).

Diet and feeding

The scientific name of the species, *Acrobatornis fonsceai* is a reference to its acrobatic habits. It tends to hang upside-down under the canopies of trees while slinking along searching for its next meal (Pacheco 1996). The diet of this bird includes mainly insects and more specifically Coleoptera, which are beetles (Birdlife International 2007). Some other species that were found in the stomachs of the birds were termites, moths, arthropods, ants, insect larvae, insect eggs, and spiders (Pacheco 1996).

Breeding

The Pink-legged Graveteiro has many special characteristics concerning the nest that it builds. One feature of the nests is that they are shaped kind of like an oven with a single chamber inside with a roof, instead of being open on top like common nests (Wilson 1996). This is why some people call it an ovenbird. The nests are made up of sticks and twigs, and are lined with leaves and moss (Wilson 1996). The type of tree that the Pink-legged Graveteiro tends to prefer for nesting over all others is the Leguminosae tree (Pacheco 1996). In a study done over the nesting of the Pink-legged Graveteiro, it was discovered that the nests were positioned in the canopies of tall shade trees (Wilson 1996). Also in the same study, where 131 nests were observed in 74 trees, it was recorded that on average there is 1.8 nests per tree, and the tree with the most nests had 5 (Wilson 1996). The interesting part about this study is that only one of the nests in each tree is actually used (Wilson 1996). The others are a kind of "mock" nest, and are usually smaller (Wilson 1996). The Pink-legged Graveteiro does this to ward off predators and to even use them as a resource for future nest building (Wilson 1996). These nests are put to use sometime between or after September and October, which happens to be their breeding season (Birdlife 2004). Within the nest every family member does their part, it is really a family affair. Both male and female parents play their role in the feeding of the 2 to 3 young that they produce that still need help feeding (Pacheco 1996). To help the parents the offspring that are not quite adults but can fly help with the feeding of the young, and with some repairs around the nest (Wilson 1996).

Conservation and threats

The Atlantic Forest of Brazil, where the Pink-legged Graveteiro is located, originally covered 330,000,000 acres (1,300,000 km²) of land and has quickly been reduced down to 7 percent of its original size (Places We Work 2007). The forest used to stretch from Rio Grande do Norte and Cerra to the north, to Rio Grande do Sol to the south (Atlantic Forest 2008). It also used to spread out over the coastal plains and the foothills and slopes of Serr do Mar (Atlantic Forest 2008). 5 percent of all vertebrates on earth call this forest home, and there are 2,200 different types of birds, mammals reptiles and amphibians (Places We Work 2007). The Atlantic Forest holds 8 percent of all the plants found on earth, including 20,000 different types of plants, with more being discovered all the time (Places We Work 2007). Because of its biodiversity, the Atlantic Forest is rightfully considered a biological hotspot (Atlantic Forest 2008). Some other statistics that directly affect the Pink-legged Graveteiro are that 60% of all Brazil's endangered animals reside here, and there are almost 200 different bird species that are only found in this remote location on earth (Places We Work 2007).

The degradation of the Atlantic Forest began when the Portuguese pioneers came over to settle the land (Atlantic Forest 2008). To get cattle they would chop down the trees and use it as an export trade and in return they would get the cattle (Atlantic Forest 2008). Also, the French and Spanish settlers cleared the forest for their cattle ranches (Atlantic Forest 2008). These same ideas are still in place today. People are still clearing land for timber and for more land for agriculture and grazing.

Another threat to the Atlantic Forest is population increase and the many problems that come with it. Currently the portion of Brazil that happens to have the most potential to have for the greatest biodiversity is the most populated region of Brazil (Atlantic Forest 2008). Two of the three most populated cities in South America are located here, São Paulo and Rio de Janeiro (Atlantic Forest 2008). This area makes up 70% of Brazil's population, and it is the location of the majority of its industries (Places We Work 2007). All of this poses major threats to the survival of the Atlantic Forest. As these two huge towns increase there will be a demand to expand which will mean taking out even more of the precious forest. They will want to make way for new housing developments as well as space for more industries to be manufactured. Along with all of this expansion and industrialization comes pollution. All different types of pollution, water, air, soil, all things that will hinder the integrity of the Atlantic Forest. Along with the people moving into Brazil comes the need for roads. The building of roads through the forests have left species of animals isolated in fragmented spaces when some of them need a large amount of space to survive (Ecosystem Profile 2001).

Another problem that the Atlantic Forest faces is logging. Logging is an age old business in Brazil, but has recently expanded to the point where the government had to ban it entirely in 1990 (Ecosystem Profile 2001). However, the logging continued and was done mainly illegally and is continuing to expand (Ecosystem Profile 2001). The harm that this does to the land is obvious. When you wipe out a creature's habitat you take away everything they need to survive which may wipe them out too if something is not done.

Monoculture and intensive land use are also harmful to the Atlantic forest, and they may go hand in hand. Eucalyptus trees are one example of a monoculture that has hurt the integrity of the forest as well as stripping the soil of nutrients without putting much back (Ecosystem Profile 2001). Another intensive use of the land is grazing (Ecosystem Profile 2001). To make room for the 1.8 million cows that occupy the region, the owners burn the forests and allow the cattle to overgraze the land (Ecosystem Profile 2001).

The Pink-legged Graveteiro populates a small area in the southeastern part of Bahia, Brazil in a part of the Atlantic Forest (Birdlife International 2007). More specifically, from the Rio de Contas in the north, to the Rio Jequitinhonha in the south, and from Ipiau in the west, to Itabuna in east. (Pacheco 1996). This part of Brazil gets more than 1300 millimeters of rain a year, and is a very hot and humid location (Pacheco 1996). Much of this naturally forested area has been converted into cocoa plantations, which is good news for the Pink-legged Graveteiro because its survival seems to depend on the presence of cocoa trees (Pacheco 1996). Although cocoa plantations are a type of agriculture and that means a lot of the biodiversity of an area is wiped out. However, cocoa plantations are one of the best forms of agriculture where habitat conservation is concerned. The main reason for this is that cocoa trees live in the under story of large shade trees (Greenburg 2006). The process for preparing the land for cocoa fields consists of clearing the under story of the forest, and reducing the canopy to about 10 percent of the trees that are naturally found (Line 1996). This type of agriculture is beneficial because the plantations can support life at more than one level compared to types of monoculture that can only hold life at one level. It also creates habitat that connects other habitats, which helps lessen the problem of habitat fragmentation. The Pink-legged Graveteiro really uses the cocoa plantations to the best of its ability. In the upper level, in the shade trees is where they make their nests and raise their young. In the lower levels of cocoa trees is where the Pink-legged Graveteiro does its foraging. There is enough biodiversity in the lower level to support all the food sources the Pink-legged Graveteiro needs to survive.

The cocoa plantations are facing many threats that will harm the Pink-legged Graveteiro if they are not reversed. When dealing with the “Evil Quartet”, habitat destruction and some over exploitation of the land are the two main factors driving the Pink-legged Graveteiro to endangerment. The overexploitation comes from cattle overgrazing in the pastures. The habitat destruction comes from many different problems. The first is the switch from shade crops to partly sun or even full sun crops, which will eliminate the different levels that sustain life in the shade plantations (Greenburg 2006). Also, about 5,000 km of cocoa plantation are estimated to be converted to pasture land in the coming years (McGinley 2007). This will further habitat fragmentation of this area making it hard for animals that reside in the plantation to move from one part of their habitat to another part of their habitat (McGinley 2007). One problem that the plantations have already experienced and was very detrimental to their livelihood was the outbreak of a disease called “Witches’ Broom” in the 1980s and 1990s. Witches’ Broom is caused by the fungus *Crinipellis pernicious*, this fungus wiped out a large portion of the cocoa that was being produced in Brazil and other surrounding countries (Oxford University Press 2005). At about the same time as the outbreak of Witches’ Broom, the market for cocoa crashed (Line 1996). The combination of these two catastrophes left the owners with

nothing else to do for money but chop down the trees and sell them for cash, destroying the Pink-legged Graveteiro's habitat (Line 1996).

The first part of restoring the Pink-legged Graveteiro back to sustainable numbers, is starting with the conservation of the Atlantic Forest. There are many conservation efforts already in place that are meant to serve the Atlantic Forest, and rightly so. The Atlantic Forest is home to 5 percent of the world's vertebrates and 8 percent of the world's plants (Places We Work 2007). Only about 8 percent of unbroken original habitat is left to support this hotspot (Duffy 2007). The government of Brazil is working to protect this vital piece of habitat by setting aside land for 108 national state parks, 85 federal and state biological reserves, and 31 federal and state ecological reserves, totaling 225 different areas set aside for conservation (Duffy 2007). Another successful program put in place is the private reserve system, which covers almost 1,000 kilometers of the Atlantic Forest (Duffy 2007). One main strategy that is in place to encourage biodiversity is establishing corridors because the habitats that are remaining are severely fragmented (Duffy 2007). There are many corridors being established to connect the wildlife, but the main one in the Atlantic Forest is located in the south part of Bahia and Espirito Santo (Duffy 2007).

One agency that is in the process of protecting the Atlantic Forest is the Nature Conservancy which has been in business since 1991 with a host of partners to help it along (Places We Work 2007). Their plan is to have 30,000,000 acres (120,000 km²) of forest restored and protected by 2015 (Places We Work 2007). The Nature Conservancy's main way of accomplishing this is through corridors (Places We Work 2007). These corridors will help reduce the growing fragmentation problems in Brazil and ensure the gene exchange throughout the different populations that inhabit the land (Places We Work 2007). One key point that the Nature Conservancy recognizes is the needs of the people that live in area (Places We Work 2007). Through their program they plan to develop economic alternatives that will support both forest protection and the local people, and also provide incentives for conservation (Places We Work 2007).

Another group that is helping the Atlantic Forest is the Critical Ecosystems Partnership Fund, which was started in 2002 (Duffy 2007). Through this program they strive to conserve threatened and endangered species through the Species Protection Program (Duffy 2007). Also, they help people that own land in Brazil manage their land in a sustainable way through the Program for Supporting Private Natural Heritage Reserves (Duffy 2007). Not only will this support biodiversity, but it will also ensure that the land is usable in the coming years. Lastly, the Critical Ecosystems Partnership Fund will supply the technology and support that is needed for private conservation efforts through the Institutional Strengthening Program (Duffy 2007). If the people do not have the technology and support that is necessary there will be no way for them to manage their land in a sustainable way.

There have also been recommended ways to increase the biodiversity within the cocoa plantations themselves. One way is to increase the diversity of the shade crops that are used (Greenburg 2006). The different types of shade crops that are brought in will bring

their own pieces of biodiversity with them adding to the total biodiversity of the farm (Greenburg 2006). It would also be beneficial if the shade crops that are planted were native to the area (Greenburg 2006). This helps keep out a member of the “Evil Quartet”, invasive species. If the farmer sticks with what is naturally found in Brazil no harmful species will accidentally be brought in. Another way that is recommended is to leave buffer zones of the natural vegetation on the edges of streams, property lines, and forest reserves (Greenburg 2006). This may be a small way to add biodiversity, but if every farmer started using this tactic it would all equal out to be a large contribution to biodiversity. Also, farmers could leave small trees to grow when they are weeding their fields (Greenburg 2006). Not only will this add to biodiversity of the plantation, it will also allow for more, fresh shade trees in the future. Throughout this all the native people of Brazil really need to be kept in mind. There are a few ways to do this and they include many incentives for supporting biodiversity, because without incentives the farmer is more likely to destroy the land. Some ways would be to guarantee free trade, access to pre-harvest credit, and taxing agrochemical inputs (Greenburg 2006).

One group that has helped the Pink-legged Graveteiro specifically is Birdlife (Langley 2003). They believe that many of the practices used in cocoa farming are not all that bad compared to other different types of agriculture (Langley 2003). So in their conservation effort they want to encourage and assist farmers in becoming organically certified (Langley 2003). To be an organic cocoa farmer you must maintain 20 percent of original forest on their farms (Langley 2003). The 20 percent more original forest will give the Pink-legged Graveteiro a lot more space for it to nest. This strategy will not only be beneficial to the Pink-legged Graveteiro, but will also help all other types of wildlife that thrive in the original forest. It is a way to help deal with the large problem of habitat fragmentation that is happening in the Atlantic Forest by connecting the environments that surround the farms. This plan will also help the farmers. There is growing market for organically grow foods, and in the end they may end up profiting from going organic. It will also help maintain the integrity of the soil so that future generations will be able to farm there too.

Chapter 6

Acrocephalus and Aechmophorus

Acrocephalus

Acrocephalus



Australian Reed-warbler, *Acrocephalus australis*

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Passeriformes

Family: Acrocephalidae
Acrocephalus
Genus: J. A. Naumann and J. F. Naumann,
1811

The *Acrocephalus* warblers are small, insectivorous passerine birds belonging to the genus *Acrocephalus*. Formerly in the paraphyletic Old World warbler assemblage, they are now separated as the namesake of the marsh- and tree-warbler family Acrocephalidae. They are sometimes called **marsh-warblers** or **reed-warblers**, but this invites confusion with Marsh Warbler and Reed Warbler proper, especially in North America where it is common to use lower case for bird species.

These are rather drab brownish warblers usually associated with marshes or other wetlands. Some are streaked, others plain. Many species are migratory.

Many species have a flat head profile, which gives rise to the group's scientific name.

Species breeding in temperate regions are strongly migratory.

The most enigmatic species of the genus, the Large-billed Reed-warbler (*A. orinus*), was rediscovered in Thailand on March, 2006. It was only found once before, in 1867. It was found also in a remote corner of Afghanistan in the Summer 2009.

List of species in taxonomic order



This Reed Warbler is raising the young of a Common Cuckoo

- Moustached Warbler, *Acrocephalus melanopogon*
- Aquatic Warbler, *Acrocephalus paludicola*
- Sedge Warbler, *Acrocephalus schoenobaenus*
- Streaked Reed-warbler, *Acrocephalus sorghophilus*
- Black-browed Reed-warbler, *Acrocephalus bistrigiceps*
- Paddyfield Warbler, *Acrocephalus agricola*
- Manchurian Reed-warbler, *Acrocephalus tangorum* (sometimes included in *A. agricola*)
- Blunt-winged Warbler, *Acrocephalus concinens*

- Eurasian Reed Warbler, *Acrocephalus scirpaceus*
 - Caspian Reed Warbler, *Acrocephalus (scirpaceus) fuscus*
 - Mangrove Reed Warbler, *Acrocephalus (scirpaceus) avicenniae*
- African Reed Warbler, *Acrocephalus baeticatus*
- Blyth's Reed Warbler, *Acrocephalus dumetorum*
- Marsh Warbler, *Acrocephalus palustris*
- Great Reed-warbler, *Acrocephalus arundinaceus*
- Oriental Reed-warbler, *Acrocephalus orientalis*
- Clamorous Reed-warbler, *Acrocephalus stentoreus*
- Large-billed Reed-warbler, *Acrocephalus orinus*
- Basra Reed-warbler, *Acrocephalus griseldis*
- Australian Reed-warbler, *Acrocephalus australis*
- Nightingale Reed-warbler, *Acrocephalus luscini*
 - Aguiguan Nightingale Reed-warbler, *Acrocephalus luscini nijoi* – doubtfully distinct; extinct (c.1997)
 - Astrolabe Nightingale Reed-warbler, *Acrocephalus luscini astrolabii* – extinct (mid-19th century?)
 - Pagan Nightingale Reed-warbler, *Acrocephalus luscini yamashinae* – doubtfully distinct; extinct (1970s)
- Caroline Reed-warbler, *Acrocephalus syrinx*
- Nauru Reed-warbler, *Acrocephalus rehsei*
 - Marshall Islands Reed-warbler, *Acrocephalus rehsei* ssp.? – hypothetical; extinct (c.1880?)
- Millerbird, *Acrocephalus familiaris*
 - Nihoa Millerbird, *Acrocephalus familiaris kingi*
 - Laysan Millerbird, *Acrocephalus familiaris familiaris* – extinct (late 1910s)
- Christmas Island Warbler, *Acrocephalus aequinoctialis*
- Tahiti Reed-warbler, *Acrocephalus caffer*
 - Huahine Reed-warbler, *Acrocephalus caffer garretti* – extinct (19th century?), renamed in *Acrocephalus musae garretti*
 - Raiatea Reed-warbler, *Acrocephalus caffer musae* – extinct (19th century?), renamed in *Acrocephalus musae musae*
- Moorea Reed-warbler, *Acrocephalus longirostris* – extinct (1980s?) (split from *Acrocephalus caffer* in 2008)
- Tuamotu Reed-warbler, *Acrocephalus atyphus*
- Rimatara Reed-warbler, *Acrocephalus rimatarae*
- Pitcairn Reed-warbler, *Acrocephalus vaughani*
- Henderson Island Reed-warbler, *Acrocephalus taiti*
- Marquesan Reed-warbler, *Acrocephalus mendanae*
- Cook Islands Reed-warbler, *Acrocephalus kerearako*
- Greater Swamp-warbler, *Acrocephalus rufescens*
- Cape Verde Swamp-warbler, *Acrocephalus brevipennis*
- Lesser Swamp-warbler, *Acrocephalus gracilirostris*
- Madagascar Swamp-warbler, *Acrocephalus newtoni*
- Thick-billed Warbler, *Acrocephalus aedon*

- Rodrigues Brush-warbler, *Acrocephalus rodericanus*
- Seychelles Warbler, *Acrocephalus sechellensis*

Fragmentary fossil remains from the Late Miocene (about 11 mya) of Rudabánya (NE Hungary) show some apomorphies typical of this genus (Bernor *et al.* 2002). Given its rather early age (most Passerida genera are not known until the Pliocene), it is not too certain that it is correctly placed here, but it is highly likely to belong to the Acrocephalidae at the least.

Aechmophorus

Aechmophorus



Clark's Grebe

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Podicipediformes
Family:	Podicipedidae
Genus:	<i>Aechmophorus</i> Coues, 1862

Species

A. occidentalis
A. clarkii

Aechmophorus is a genus of birds in the grebe family.

It has two living representatives breeding in western North America.

- Western Grebe, *Aechmophorus occidentalis*
- Clark's Grebe, *Aechmophorus clarkii*

One prehistoric species has been described from fossil remains:

- *Aechmophorus elasson* (Late Pliocene of W USA)

Although the two living species look very similar, bill shape and coloration, as well as feathering around the scarlet eye of the bird can be used to determine the precise species.

Distinguishing Features

The Western grebe has a straight bill with a dull green-yellow color as opposed to the Clark's grebe, which has a slightly upturned, bright orange-yellow bill. In both species the male has a longer and deeper bill than that of the female, making it a distinguishing feature (Nuechterlein & Buitron 1989). All species of grebes display the pattern of lobed feet. A tough skin surrounds each toe separately, providing more surface area for effective swimming. This form increases the power of propulsion per stroke and reduces drag when the bird is recovering (Johansson & Norberg 2001). Skeletal measurements taken from both species, when averaged together, revealed that for the most part the Western grebe is larger than the Clark's grebe (Livezey & Storer 1992). The two species also differ in their advertising calls. The Western grebe gives a call that includes two distinct "cree-cree" notes, while the Clark's grebe consists of a single "creet" note, more drawn out (Nuechterlein 1981).

Distribution and habits

Western North America is home for nearly all individuals of both species of grebes. When migration occurs, the birds in the northern range will travel west in flocks, at night to the Pacific coast. Both Western grebes and Clark's grebes winter in sheltered bays or estuaries on the Pacific coast and summer in freshwater lakes with marshy vegetation as well as large open areas of water. The site of nesting is usually in a shallow water marsh. Both males and females help to build a floating platform nest of vegetation (Kaufman 1996). Because of the colonial nature of these birds nests must be continually guarded during the breeding season. If left unattended other pairs of birds seeking nest sites will seize the platform (Nuechterlein & Storer 1989).

These two species, like most grebes, eat a diet consisting mostly of fish. They are also known to forage on crustaceans, insects, worms and salamanders (Kaufman 1996). Foraging techniques are composed of a number of foot-propelled dives. Current research is associating the use of springing dives by the Clark's grebe, in which the bird essentially leaps from the water before submerging, allowing it to reach deeper below the surface, with possibly proving niche separation between the two species (Nuechterlein & Buitron 1989).

Reproduction

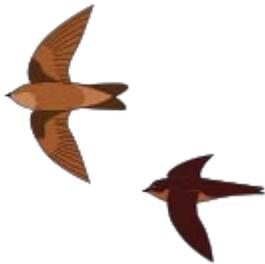
Western grebes and Clark's grebes take part in a courtship display known as mate feeding. This occurs regularly between a mated pair during the period prior to hatching of nestlings. In both species mate feeding appears to peak shortly before egg laying and involves the male providing large quantities of food to the begging female (Nuechterlein & Storer 1989). Pairs will also engage in a spectacular display, by rearing up and "rushing" across the surface of the water side by side, making a loud pattering sound with their feet. This display is not only done by mated pairs, but can also be done by two males competing for a female as well as the female along with the two males. Therefore, it has been suggested that the "rushing" ceremony is done for more than one purpose.

The typical clutch size for both Western and Clark's grebes is between 2 and 4 eggs per season. They are usually a pale bluish white and become stained by the nest to a speckled brown (Kaufman 1996, Nuechterlein & Storer 1989). Downy young of the Western grebe display a uniform gray along the back, a white belly along with a dark patch on the forehead. This differs in Clark's grebes where the young are almost entirely white. Both species of nestlings have an area of skin on the crown that changes color from orange to scarlet if the chick needs feeding or is in distress (Storer 1969). Males tend to hunt and provide chicks with food more often than females, however only one fish can be caught during each dive (Livezey & Storer 1992). Fledging occurs just hours after the last nestling emerges from its shell. The semialtricial nestlings travel on the backs of their parents for several weeks, this is referred to as back brooding and both parents participate in the activity. For the first two weeks after hatching chicks are completely camouflaged by their parents back feathers and will progressively become more visible. Chicks will stay close to their parents when predators are spotted or during feedings (Nuechterlein 1988).

Chapter 7

Aerodramus

Aerodramus



Indian Swiftlet
Aerodramus unicolor

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Apodiformes
Family:	Apodidae
Genus:	<i>Aerodramus</i> Oberholser, 1906

Aerodramus is a genus of small, dark, cave-nesting birds in the Collocaliini tribe of the swift family. Its members are confined to tropical and subtropical regions in southern Asia, Oceania and northeastern Australia. Many of its members were formerly classified in *Collocalia*, but were first placed in a separate genus by American ornithologist Harry Church Oberholser in 1906.

This is a taxonomically difficult group of very similar species. Echolocation, DNA sequencing and parasitic lice have all been used to establish relationships, but some

problems, such as the placement of the Papuan Swiftlet are not fully resolved. These swiftlets can pose major identification problems where several species occur.

What distinguishes *Aerodramus* swiftlets from other swifts, and indeed almost all other birds, is their ability to use a simple but effective form of echolocation. This enables them to navigate within the breeding and roosting caves.

The nests of *Aerodramus* swiftlets are constructed with saliva as a major component. In two species, saliva is the only material used, and the nests are collected for the famous Chinese delicacy 'bird's nest soup', the over-collection of which puts pressure on the swiftlet populations.

Distribution

The range of these swiftlets is confined to tropical southern Asia, Oceania, northeastern Australia and the Indian Ocean, with the greatest diversity in Southeast Asia, Indonesia and Papua New Guinea. Several of the species are restricted to small islands, and their limited range can make them vulnerable, like the Seychelles, Whitehead's and Guam Swiftlets. The Mangaia Swiftlet is a recently extinct species known only from fossils.

Description



White-rumped Swiftlet in flight

Aerodramus swiftlets are in many respects typical swifts, having narrow wings for fast flight, and a wide gape and small reduced beak surrounded by bristles for catching insects in flight. They have dull plumage which is mainly in shades of black, brown, and grey. Members of this genus typically have dark brown upper wings and upper body, sometimes with a paler rump, light brown underparts, a paler throat, and brownish-white under-wings with dark brown "armpits". Males and female plumages are similar in appearance, as is that of the juvenile, for those species for which it has been described; in some species the juvenile shows pale fringes to the flight feathers.

The legs, as with many swifts, are very short, preventing the birds from perching, but allowing them to cling to vertical surfaces. The flight is mainly gliding due to very long primary feathers and small breast muscles. *Aerodramus* swiftlets, depending on species, weigh 8–35 grammes (0.28–1.23 oz) and are 9–16 centimetres (0.28–1.23 in) long. These swiftlets are very similar, and where several species occur, such as Borneo, New Guinea and the Philippines, may not be separable in the field.

Behaviour



These juvenile German's Swiftlets have fallen from nests, and are being reared by hand.

Aerodramus swiftlets are aerial insectivores, which take prey like flies on the wing. They roost and breed in caves; during the day they leave the caves to forage for food, and return to roost at night. They are monogamous and both partners take part in caring for the nestlings. Males perform aerial displays to attract females and mating occurs at the nest. The breeding season overlaps the wet season, which corresponds to an increased insect population.

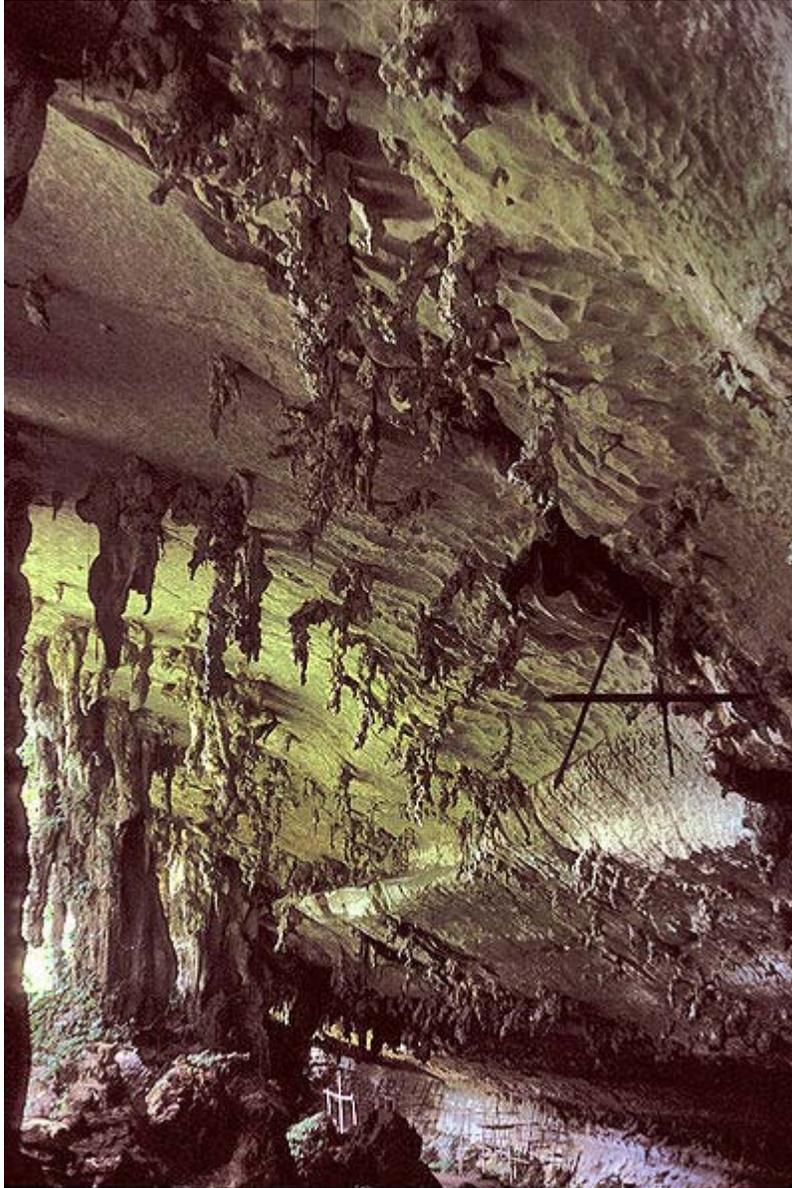
Clutch size depends on the location and the food source, but generally *Aerodramus* swiftlets lay one or two eggs. The eggs are a dull white, and are laid every other day. Many, if not all, species are colonial nesters; some build their nests in high, dark corners on cave walls.

Most *Aerodramus* swiftlets live in the tropical Indo-Pacific region and do not migrate. These birds usually remain in one cave or other roosting/nesting site. Examples of cave

sites include the Niah Caves and Gunung Mulu National Park, which are both located in Sarawak, Malaysian Borneo.

Characteristics of behaviour, such as what materials apart from saliva the nests contain, can be used to differentiate between certain species of *Aerodramus*.

Echolocation



Niah cave, a swiftlet nesting site

The genus *Aerodramus* is of special interest due to its use of echolocation. The swiftlets use this technique to navigate in darkness through the chasms and shafts of the caves

where they breed and roost at night. Apart from swiftlets, the only other avian species to use echolocation is the unrelated Oilbird.

The *Aerodramus* swiftlets' echolocating double clicks are within the normal human hearing range and up to 3 milliseconds apart, with the interval becoming shorter in darker locations. Unlike the rest of the genus (for those species which have been studied), the Atiu Swiftlet, *Aerodramus sawtelli*, and the Black-nest Swiftlet, *A. maximus*, emit only single clicks. Interestingly, the former species also uses echolocation outside its caves.

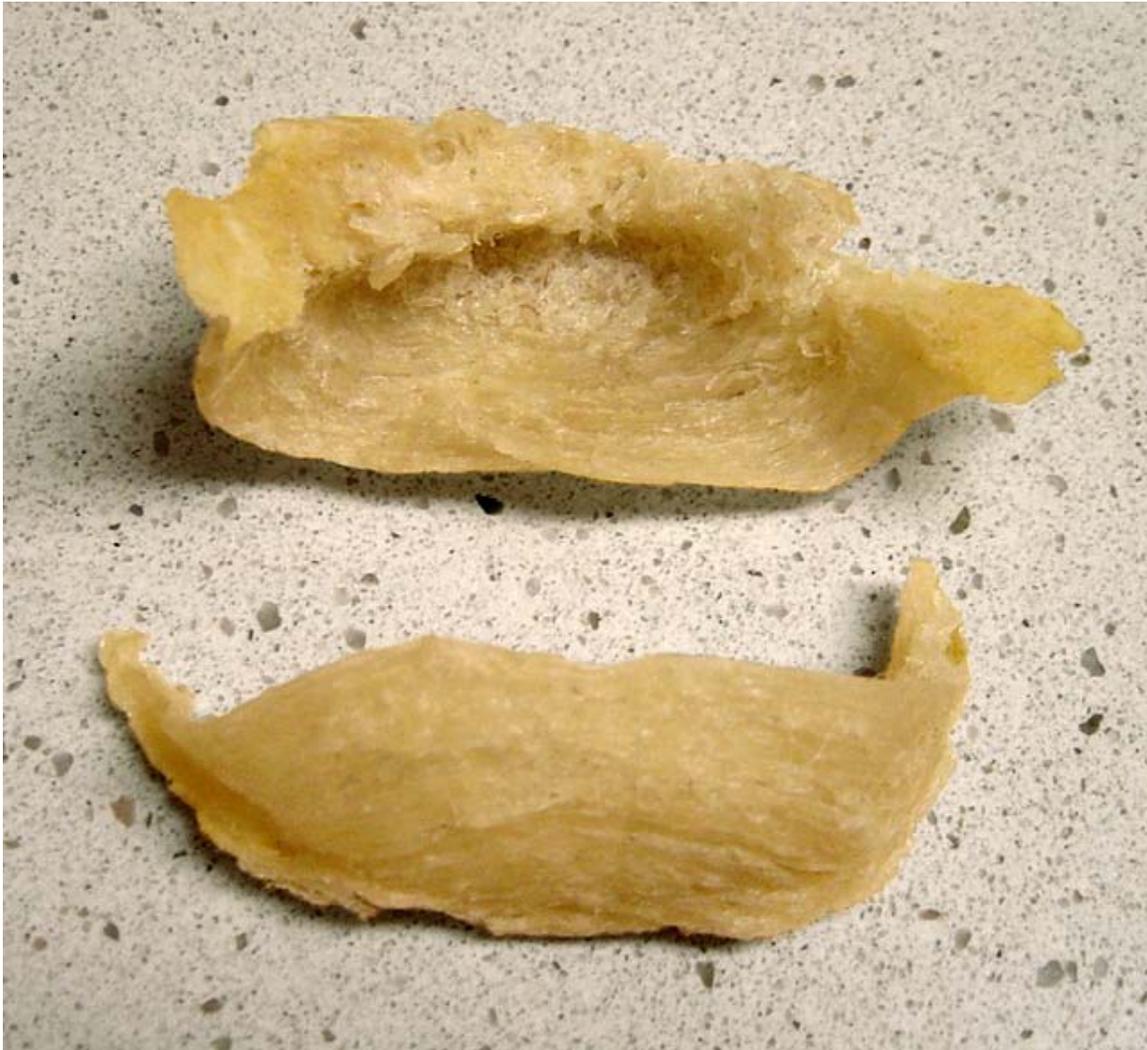
The use of echolocation was once used to separate *Aerodramus* from the other non-echolocating cave swiftlet genera *Collocalia* and *Hydrochous* (virtually nothing is known about *Schoutedenapus*). However, recently, the Pygmy Swiftlet, *Collocalia troglodytes*, was discovered making similar clicking noises both inside and outside its roosting cave.

It has recently been determined that the echolocation vocalizations do not agree with evolutionary relationship between swiftlet species as suggested by DNA sequence comparison. This suggests that as in bats, echolocation sounds, once present, adapt rapidly and independently to the particular species' acoustic environment.

A study suggested that the echolocation subunits were mainly located in the central nervous system, while the subunits in the vocal apparatus were already present and capable of use before echolocation even evolved. This study supports the hypothesis of independent evolution of echolocation in *Aerodramus* and *Collocalia*, with the subsequent evolution of complex behaviour needed to complement the physical echolocation system, or just possibly that the vocal apparatus-parts of the echolocation system might even be inherited from some prehistoric nocturnal ancestor.

It has been suggested that the Giant or Waterfall Swiftlet, *Hydrochous gigas*, which cannot echolocate, may be descended from an echolocating ancestor.

Saliva nests



An edible nest

The intricately constructed saliva nests of this swiftlet genus, which in some species contain no other material, are collected to make the delicacy bird's nest soup. They therefore command extremely high prices.

Authentic bird's nest soup is made from the nests of the Edible-nest Swiftlet (or White-nest Swiftlet), *Aerodramus fuciphagus*, and the Black-nest Swiftlet, *Aerodramus maximus*. Instead of incorporating twigs, feathers and straw like others in the genus, these two swiftlets make their nest only from strands of their gummy saliva, which harden when exposed to air. Once the nests are harvested, they are cleaned and sold to restaurants. Over the past twenty years, the high demand for the nests of these *Aerodramus* species has had an adverse effect on their populations. The Niah caves population of Black-nest Swiftlets plunged from around 1.5 million pairs in 1959 to 150,000–298,000 pairs in the early 1990s through over-harvesting.

Early authors had doubts about the material used to make the nest, with whale and fish sperm and sea foam being proposed as the basis for construction. Even in the 1830s, when the use of saliva had been fairly well established, it was believed that it was only a cement to bind a sea plant which provided the bulk of the gelatinous material of the nest.

Lice

As with other taxonomically difficult groups, ectoparasites can give information on relationships. A study of swiftlet parasites in northern Borneo involved transferring lice between closely related swiftlet species. The survival of lice in most of these transfers was significantly reduced in proportion to the mean difference in feather barb size between the donor and recipient species of hosts. Thus, adaptation to a particular resource on the body of the host appears to govern the specificity of swiftlet lice. In transfers where lice survived, the lice moved to different areas on the body of the host where the mean barb diameter of the feathers on which the lice occurred had the required value.

Papuan Swiftlet

The Papuan Swiftlet, *Aerodramus papuensis*, has three toes instead of the usual four in this group. It has the ability to echolocate, but whereas other previously studied species use echolocation primarily while flying in their caves, the Papuan Swiftlet appears to be nocturnal or crepuscular and uses echolocation while active outside at night. It uses single, not double, clicks. DNA sequence data provides strong support for a basal relationship between *A. papuensis* and other *Aerodramus* taxa and suggest that this species and the Waterfall Swift *Hydrochous gigas*, are sister taxa, a relationship that would indicate paraphyly of the genus *Aerodramus*.

Species in taxonomic order



John Latham figure of the "Esculent Swallow and its Nest"

- Seychelles Swiftlet, *Aerodramus elaphrus*
- Mascarene Swiftlet, *Aerodramus francicus*
- Indian Swiftlet, *Aerodramus unicolor*
- Philippine Swiftlet, *Aerodramus mearnsi*
- Moluccan Swiftlet, *Aerodramus infuscatus*
- Mountain Swiftlet, *Aerodramus hirundinaceus*
- White-rumped Swiftlet, *Aerodramus spodiopygius*
- Australian Swiftlet, *Aerodramus terraereginae*
- Himalayan Swiftlet, *Aerodramus brevirostris*
- Indochinese Swiftlet, *Aerodramus rogersi* (sometimes included in *A. brevirostris*)
- Volcano Swiftlet, *Aerodramus vulcanorum* (sometimes included in *A. brevirostris*)
- Whitehead's Swiftlet, *Aerodramus whiteheadi*
- Bare-legged Swiftlet, *Aerodramus nuditarsus*
- Mayr's Swiftlet, *Aerodramus orientalis*
- Palawan Swiftlet, *Aerodramus palawanensis*
- Mossy-nest Swiftlet, *Aerodramus salangana* (sometimes included in *A. vanikorensis*)
- Uniform Swiftlet, *Aerodramus vanikorensis*
- Grey Swiftlet, *Aerodramus amelis*
- Palau Swiftlet, *Aerodramus pelewensis*

- Guam Swiftlet, *Aerodramus bartschi*
- Caroline Islands Swiftlet, *Aerodramus inquietus*
- Mangaia Swiftlet, *Aerodramus manuoi* (prehistoric extinction)
- Atiu Swiftlet, *Aerodramus sawtelli*
- Polynesian Swiftlet, *Aerodramus leucophaeus*
- Marquesan Swiftlet, *Aerodramus ocistus*
- Black-nest Swiftlet, *Aerodramus maximus*
- Edible-nest Swiftlet, *Aerodramus fuciphagus*
 - Brown-rumped Swiftlet, *Aerodramus (fuciphagus) vestitus*
- German's Swiftlet, *Aerodramus germani*
- Papuan Swiftlet, *Aerodramus papuensis* (probably belongs in a distinct genus)

Chapter 8

Aethia

Aethia



Aethia pygmaea

Scientific classification

Kingdom: Animalia
Phylum: Chordata
Class: Aves
Order: Charadriiformes
Family: Alcidae
Genus: *Aethia*
Merrem, 1788

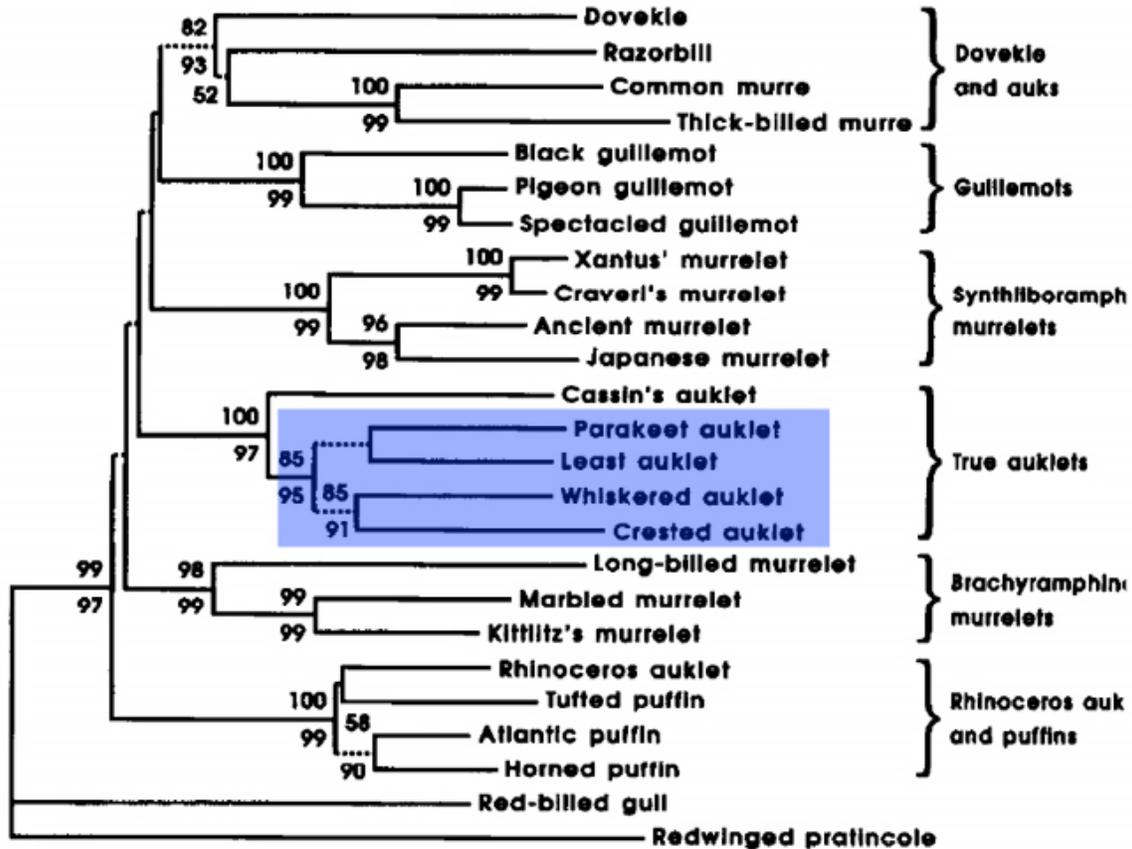
Species

Aethia cristatella
Aethia psittacula
Aethia pusilla

Aethia pygmaea

Aethia is a genus of four small (85-300g) auklets endemic to the North Pacific Ocean, Bering Sea and Sea of Okhotsk and among some of North America's most abundant seabirds. The relationships between the four true auklets remains unclear. Auklets are threatened by invasive species such as Arctic Foxes (*Alopex lagopus*) and Norway Rats (*Rattus norvegicus*) because of their high degree of coloniality and crevice-nesting.

Taxonomy and Evolution



Current accepted taxonomy of the Alcidae with *Aethia* shown in blue. Modified from Friesen et al. 1996. Mol. Biol. Evol. 13, 359-367.

The genus *Aethia* occurs only in the North Pacific and adjacent waters, mainly in the Bering Sea region. Along with Cassin's Auklet (*Ptychoramphus aleuticus*) they comprise the monophyletic tribe Aethini. Molecular work has not yet resolved the relationship between the *Aethia* auklets, but the group is a sister group to Cassin's Auklet, which is, in turn, a sister group to the Fraterculine auks (puffins and Rhinoceros Auklet).

The genus *Aethia* did not enter into widespread use until the 1960s. Initially, the auklets were placed in *Alca*, but later reorganized into genera including: *Simorhynchus*, *Phaleris* and *Cyclorhynchus*. *Cyclorhynchus* is still occasionally used for the Parakeet Auklet.

Fossil record

The first undisputed auk fossils are from the middle Miocene (15 million years ago). The first *Aethia* fossils date from the late Miocene (10-15 million years ago) and the four species likely diverged rapidly about 5 million years ago.

There are one or two fossil species which lived in the area of today's California during the Late Miocene, some 5 million years ago: *Aethia rossmoori* (Monterrey Formation of Orange County) and an undescribed taxon tentatively placed in this genus.

Species

There are four species of *Aethia*.



Least Auklet *Aethia pusilla*



Crested Auklet *Aethia cristatella*



Whiskered Auklet *Aethia pygmaea*



Parakeet Auklet *Aethia psittacula*

Distribution

Population Estimates

Censusing breeding auklets can be difficult because they nest in hidden crevices. At present, population estimates are:

- Least Auklet - 20,000,000+
- Whiskered Auklet - 100,000 - 250,000
- Crested Auklet - 5,000,000 - 10,000,000
- Parakeet Auklet - 1,000,000 - 2,000,000

Breeding Season

Aethia auklets are endemic to the North Pacific Ocean and Sea of Okhotsk with notable Asian colonies in the Kuril Islands, Commander Islands, along the Kamchatka and Chukota Peninsulas. In North America, large colonies are in the Aleutian Islands (Buldir, Kiska, Semisopochnoi and Gareloi) to the Gulf of Alaska and north to the islands of the Bering Sea (St. Lawrence Island, Pribilof Islands, St. Matthew Island).

Auklets are have high site fidelity, at both the colony and crevice level, although there can be a high divorce rate of up to 33% in Least and Crested Auklets when both mates survive.

Winter Distribution

Winter distribution of auklets is poorly known. Whiskered Auklets likely winter near to breeding colonies and many were reported by Aleuts to winter in the general area. Auklets from the northern Bering Sea must move further south because of pack ice surrounding colonies during the winter.

Breeding

Auklets are typically very social and nest in dense colonies (Parakeet Auklets are more dispersed). All have some form of facial ornamentation such as large crests (Whiskered and Crested Auklets), auricular plumes (all four species), and Crested and Whiskered Auklets have a tangerine-scented odour which may function in mate choice or species recognition, although this requires more study.

All *Aethia* auklets lay one white egg in a natural crevice and incubate for 25–36 days, after which, a semi-precocial chick emerges and fledges after 25–35 days. Age at first breeding is estimated at 3–5 years. Colony sizes are highly variable, and range from less than 100 individuals to over 1 million, although Least and Crested Auklets tend to nest in greater density than Parakeet and Whiskered Auklets.

Diet

The auklets are mainly planktivores, eating a variety of calanoid copepods, euphausiids and other invertebrates such as jellyfish and ctenophores. Winter diet has not been studied.

Threats and Conservation

Because they nest in crevices, auklets are vulnerable to predation by rats, and have been extirpated from some islands that contained Arctic Foxes introduced for farming. Eradication of rats from Rat Island was completed in 2008 and 2009.

The large colony at Sirius Point, Kiska Island, Alaska (perhaps the largest auklet colony in the world) experienced almost complete breeding failure in 2001 and 2002 because of rat predation and disturbance and has been the focus of researchers at Memorial University of Newfoundland.

Chapter 9

Amazilia and Amazon Parrot

Amazilia

Amazilia



Rufous-tailed Hummingbird, *Amazilia tzacatl*

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Apodiformes
Family:	Trochilidae
Genus:	<i>Amazilia</i> Lesson, 1843

Amazilia is a hummingbird genus in the subfamily Trochilinae. It occurs in tropical Central and South America.

Systematics

Some of the species listed here are occasionally placed in the genera *Agyrtria*, *Polyerata* and *Saucerottia*. But most authorities, notably the SACC, do not accept the validity of these until more comprehensive studies are available, instead placing them all in *Amazilia*. The IUCN and BirdLife International, after splitting up the genus *Amazilia* for some time, have followed the SACC's argument and treats these hummingbirds as a single genus until enough data is available for a thorough revision.

But regardless, the present arrangement is only temporary; it is generally recognized that *Amazilia* in the broad definition is overly inclusive and perhaps not even monophyletic, and that some species would be better moved to one or more distinct genera. However, the monophyly of the proposed additional genera is not conclusively established either.

Two additional species formerly included in *Amazilia* are usually included in *Leucippus* today as they are markedly distinct, but this placement requires confirmation. These are the White-bellied Hummingbird (*L. chionogaster*) and the Green-and-white Hummingbird (*L. viridicauda*).

Species

Amazilia sensu stricto

- Rufous-tailed Hummingbird, *Amazilia tzacatl*
 - Escudo Hummingbird, *Amazilia (tzacatl) handleyi*
- Chestnut-bellied Hummingbird, *Amazilia castaneiventris*
- Amazilia Hummingbird, *Amazilia amazilia*
 - Loja Hummingbird, *Amazilia (amazilia) alticola*
- Buff-bellied Hummingbird, *Amazilia yucatanensis*
- Cinnamon Hummingbird, *Amazilia rutila*



Cinnamon-sided Hummingbird, *Amazilia (viridifrons) wagneri* or *Agyrtria (viridifrons) wagneri*

***Agyrtria* group**

- Plain-bellied Emerald, *Amazilia leucogaster* or *Agyrtria leucogaster*
- Versicoloured Emerald, *Amazilia versicolor* or *Agyrtria versicolor*
 - Blue-green Emerald or Rondonia Emerald, *Amazilia (versicolor) rondoniae* or *Agyrtria (versicolor) rondoniae*
- White-chested Emerald, *Amazilia candida* or *Agyrtria candida*
- White-bellied Emerald, *Amazilia brevirostris* or *Agyrtria brevirostris* - formerly *A. chionopectus*
- Andean Emerald, *Amazilia franciae* or *Agyrtria franciae*

- Azure-crowned Hummingbird, *Amazilia cyanocephala* or *Agyrtria cyanocephala*
 - Mosquitia Hummingbird, *Amazilia (cyanocephala) chlorostephana* or *Agyrtria (cyanocephala) chlorostephana*
- Violet-crowned Hummingbird, *Amazilia violiceps* or *Agyrtria violiceps*
- Green-fronted Hummingbird, *Amazilia viridifrons* or *Agyrtria viridifrons*
 - Cinnamon-sided Hummingbird, *Amazilia (viridifrons) wagneri* or *Agyrtria (viridifrons) wagneri*

***Polyerata* group**



Glittering-throated Emerald, *Amazilia fimbriata* or *Polyerata fimbriata*

- Glittering-throated Emerald, *Amazilia fimbriata* or *Polyerata fimbriata*
- Sapphire-spangled Emerald, *Amazilia lactea* or *Polyerata lactea*
- Blue-chested Hummingbird, *Amazilia amabilis* or *Polyerata amabilis*
 - Charming Hummingbird, *Amazilia (amabilis) decora* or *Polyerata (amabilis) decora*
- Purple-chested Hummingbird, *Amazilia rosenbergi* or *Polyerata rosenbergi*
- Mangrove Hummingbird, *Amazilia boucardi* or *Polyerata boucardi*
- Honduran Emerald, *Amazilia luciae* or *Polyerata luciae*

Saucerottia group



Copper-rumped Hummingbird, *Amazilia tobaci* or *Saucerottia tobaci*

- Steely-vented Hummingbird, *Amazilia saucerrottei* or *Saucerottia saucerrottei*
 - Blue-vented Hummingbird, *Amazilia (saucerrotei) hoffmanni* or *Saucerottia (saucerrottei) hoffmanni*
- Copper-rumped Hummingbird, *Amazilia tobaci* or *Saucerottia tobaci*
- Indigo-capped Hummingbird, *Amazilia cyanifrons* or *Saucerottia cyanifrons*
 - Alfaro's Hummingbird or Miravalles Hummingbird, *Amazilia (cyanifrons) alfaroana* or *Saucerottia (cyanifrons) alfaroana* - probably extinct (c.1900)
- Snowy-breasted Hummingbird, *Amazilia edward* or *Saucerottia edward*
- Blue-tailed Hummingbird, *Amazilia cyanura* or *Saucerottia cyanura*
- Berylline Hummingbird, *Amazilia beryllina* or *Saucerottia beryllina*
- Green-bellied Hummingbird, *Amazilia viridigaster* or *Saucerottia viridigaster*

- Copper-tailed Hummingbird, *Amazilia (viridigaster) cupreicauda* or *Saucerottia (viridigaster) cupreicauda*

Amazon parrot

Amazon parrots



Orange-winged Amazon (*Amazona amazonica*)

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Psittaciformes
Family:	Psittacidae
Subfamily:	Psittacinae
Tribe:	Arini
Genus:	<i>Amazona</i> Lesson, 1830

Diversity

c. 30 species



Festive Amazon (*Amazona festiva*), illustration by Keulemans, 1891

Amazon parrot is the common name for a parrot of the genus *Amazona*. These are medium-size parrots native to the New World ranging from South America to Mexico and the Caribbean.

Most Amazon parrots are predominantly green, with accenting colors that depend on the species and can be quite vivid. They feed primarily on seeds, nuts, and fruits, supplemented by leafy matter.

Many Amazon parrots have a remarkable ability to mimic human speech and other sounds. Partly because of this they are popular as pets or companion parrots, and a small industry has developed in breeding parrots in captivity for this market. This popularity

has led to many parrots being taken from the wild to the extent that some species have become threatened. CITES treaties have made trapping wild parrots for the pet trade illegal to protect wild populations.

Classification

- Cuban Amazon, *Amazona leucocephala*
- Yellow-billed Amazon, *Amazona collaria*
- Hispaniolan Amazon, *Amazona ventralis*
- Puerto Rican Amazon, *Amazona vittata*
- Yellow-lored Amazon, *Amazona xantholora*
- White-fronted Amazon, *Amazona albifrons*
- Black-billed Amazon, *Amazona agilis*
- Tucumán Amazon, *Amazona tucumana*
- Red-spectacled Amazon, *Amazona pretrei*
- Red-crowned Amazon, *Amazona viridigenalis*
- Lilac-crowned Amazon, *Amazona finschi*
- Red-lored Amazon, *Amazona autumnalis*
 - Lilacine Amazon, *Amazona autumnalis lilacina*
- Blue-cheeked Amazon, *Amazona dufresniana*
- Red-browed Amazon, *Amazona rhodocorytha*
- Red-tailed Amazon, *Amazona brasiliensis*
- Festive Amazon, *Amazona festiva*
- Yellow-shouldered Amazon, *Amazona barbadensis*
- Blue-fronted Amazon, *Amazona aestiva*
- Yellow-crowned Amazon, *Amazona ochrocephala*
 - Panama Amazon, *Amazona ochrocephala panamensis*
- Yellow-naped Amazon, *Amazona auropalliata*
- Yellow-headed Amazon, *Amazona oratrix*
 - Tres Mariás Amazon, *Amazona oratrix tresmariae*
- Kawall's Amazon, *Amazona kawalli*
- Orange-winged Amazon, *Amazona amazonica*
- Scaly-naped Amazon, *Amazona mercenaria*
- Mealy Amazon, *Amazona farinosa*
- Vinaceous Amazon, *Amazona vinacea*
- St. Lucia Amazon, *Amazona versicolor*
- Red-necked Amazon, *Amazona arausiaca*
- St. Vincent Amazon, *Amazona guildingii*
- Imperial Amazon, *Amazona imperialis*

The taxonomy of the Yellow-crowned Amazon (*Amazona ochrocephala* complex) is disputed, with some authorities only listing a single species (*A. ochrocephala*), while others split it into as many as three species (*A. ochrocephala*, *A. auropalliata* and *A. oratrix*). The split is primarily based on differences related to extension of yellow to the plumage and the colour of bill and legs. Phylogenetic analysis of mtDNA do not support the traditional split.

Re-classification of the Yellow-faced Parrot

The Yellow-faced Parrot (*Alipiopsitta xanthops*) was traditionally placed within this genus of Amazon parrots, but recent research has shown that it is closer to the Short-tailed Parrot and the species from the genus *Pionus*, resulting in it being transferred to the monotypic genus *Alipiopsitta*.

Hypothetically extinct species

Populations of Amazon parrots that lived on the Caribbean islands of Martinique and Guadeloupe are now extinct. It is not known if they were separate species, subspecies, or if they originated from parrots introduced to the islands by humans, and so they are regarded as hypothetical extinct species. There are no surviving remains of them, and their taxonomy may never be established. Populations of several parrot species were described mainly in the unscientific writings of early travelers, and subsequently scientifically described by several naturalists (to have their names linked to the species that they were proposing) mainly in the twentieth century, with no more evidence than the earlier observations and without specimens.

- Martinique Amazon, *Amazona martinica* (hypothetical extinct species). A.H. Clark, 1905.
- Guadeloupe Amazon, *Amazona violacea* (hypothetical extinct species). Originally called *Psittacus violaceus* by J.F. Gmelin in 1789.

Aviculture



Orange-winged Amazons in a cage with toys

The Yellow-headed Amazon, Yellow-naped Amazon, Orange-winged Amazon, and Blue-fronted Amazon are some of the Amazon parrot species, which are commonly kept as pets. Amazon parrots, together with macaws, and the African Grey Parrot are all known for their exceptional vocal abilities, playfulness, and dexterity with their feet. Hand reared parrots are very loyal loving companions, and they can live for 50 years or more in captivity. However, some amazons—even well trained ones—can be aggressive during mating season. In order to maintain health and happiness, pet parrots require much more attention than domesticated animals such as dogs or cats. They require communication, manipulative toys, supervised time out of the cage, and so forth, or they may develop self-destructive behaviors. They have a strong, innate need to chew, and thus require safe, destructible toys.

Extant species



Yellow-headed Amazon (*Amazona oratrix*)



Cuban Amazon (*Amazona leucocephala*)



Red-lored Amazon (*Amazona autumnalis*)



St. Vincent Amazon (*Amazona guildingii*)



White-fronted Amazon male (*Amazona albifrons*)



Red-crowned Amazon (*Amazona viridigenalis*)



Lilac-crowned Amazon (*Amazona finschi*)



Puerto Rican Amazon (*Amazona vittata*)

Hypothetical extinct species



Martinique Amazon (*Amazona martinica*)



Guadeloupe Amazon (*Amazona violacea*)

Chapter 10

Anas



Female Mallard (*Anas platyrhynchos*) with brood of young, a typical member of this genus.

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Subclass:	Neornithes
Infraclass:	Neognathae
Superorder:	Galloanserae
Order:	Anseriformes
Family:	Anatidae
Subfamily:	Anatinae
Genus:	<i>Anas</i> Linnaeus 1758

Anas is a genus of dabbling ducks. It includes mallards, wigeons, teals, pintails and shovelers in a number of subgenera. Some authorities prefer to elevate the subgenera to genus rank. Indeed, as the moa-nalos are very close to this clade and may have evolved

later than some of these lineages, it is rather the absence of a thorough review than lack of necessity that this genus is rather over-lumped.

Systematics

The phylogeny of this genus is one of the most confounded ones of all living birds. Research is hampered by the fact the radiation of the two major groups of *Anas* – the teals and mallard groups –; took place in a very short time and fairly recently, roughly in the mid-late Pleistocene. Furthermore, hybridization may have long played a major role in *Anas* evolution, with within-subgenus hybrids regularly and between-subgenus hybrids not infrequently being fully fertile. The relationships between species are much obscured by this fact, and mtDNA sequence data is of dubious value in resolving their relationships; on the other hand, nuclear DNA sequences evolve too slowly to resolve the phylogeny of the subgenus *Anas* for example.

Some major clades can be discerned. For example, that the traditional subgenus *Anas*, the mallard group, forms a monophyletic (in the loose sense, i.e. non-holophyletic) group has never been seriously questioned by modern science and is as good as confirmed (but see below). On the other hand, the phylogeny of the teals is very confusing.

For these reasons, the dabbling duck lineages more distantly related to mallard group (which includes the type species of *Anas*) than the wigeons should arguably be separated in their own genera. These would include the Baikal Teal, the Garganey, the spotted black-capped *Punanetta* group, and the shovelers and other blue-winged species. Whether the wigeons, which are very distinct in morphology and behavior, but much less so in mtDNA cytochrome *b* and NADH dehydrogenase subunit 2 sequences, should also be considered a distinct genus *Mareca* (including the Gadwall and Falcated Duck) is essentially the one remaining point of dispute as regards the question which taxa should remain in this genus and which ones should not.

Species

The following arrangement is based on current morphological, molecular, and behavioral characters and presents apparent major evolutionary groupings compared to the subgenera the species were placed in at one time or another.



Baikal Teal, *Anas formosa*

Probable genus *Sibirionetta* – Baikal Teal

- Baikal Teal, *Anas formosa* (formerly in *Nettion*)

Probable genus *Querquedula* – Garganey (may include *Punanetta*)

- Garganey, *Anas querquedula*

Probable genus *Punanetta*

- Silver Teal, *Anas versicolor*
- Puna Teal, *Anas puna* – formerly included in *Anas versicolor*
- Hottentot Teal, *Anas hottentota*



Red Shoveler, *Anas platalea*

Probable genus *Spatula* – blue-winged ducks/shovelers and allies (polyphyletic?)

- Blue-winged Teal, *Anas discors*
- Cinnamon Teal, *Anas cyanoptera*
 - Borrero's Cinnamon Teal, *Anas cyanoptera borroroi* – possibly extinct (late 20th century?)
- Red Shoveler, *Anas platalea*
- Cape Shoveler, *Anas smithii*
- Australasian Shoveler, *Anas rhynchotis*
- Northern Shoveler, *Anas clypeata*



American Wigeon, *Anas americana*

Possible genus ***Mareca*** – wigeons (may include *Chaulelasmus* and *Eunetta*)

- Eurasian Wigeon, *Anas penelope*
- Amsterdam Island Duck, *Anas marecula* – tentatively placed here; extinct (c.1800)
- American Wigeon, *Anas americana*
- Chiloe Wigeon, *Anas sibilatrix*

Subgenus ***Chaulelasmus*** – Gadwall

- Gadwall, *Anas strepera*
 - Coues' Gadwall or Washington Island Gadwall, *Anas strepera couesi* – extinct (late 19th century)

Subgenus ***Eunetta*** – Falcated Duck

- Falcated Duck, *Anas falcata*

Subgenus ***Dafila*** – pintails

- Northern Pintail, *Anas acuta*
- Eaton's Pintail, *Anas eatoni*
 - Kerguelen Islands Pintail, *Anas eatoni eatoni*
 - Crozet Islands Pintail, *Anas eatoni drygalskii*
- Yellow-billed Pintail, *Anas georgica*
 - South Georgia Pintail, *Anas georgica georgica*



Northern Pintail, *Anas acuta*

- Chilean Pintail, *Anas georgica spinicauda*
- Niceforo's Pintail, *Anas georgica niceforoi* – extinct (1950s)
- White-cheeked Pintail, *Anas bahamensis* (formerly in *Poecilonetta*)
- Red-billed Teal, *Anas erythrorhyncha* (formerly in *Poecilonetta*)
- Cape Teal, *Anas capensis* (formerly in *Nettion*)

Subgenus *Nettion* – teals (paraphyletic)

- Indian Ocean clade (sometimes subgenus *Virago*)
 - Bernier's Teal, *Anas bernieri*
 - Mauritian Duck, *Anas theodori* – extinct (late 1690s)
 - Sunda Teal, *Anas gibberifrons*
 - Rennell Island Teal, *Anas gibberifrons remissa* – extinct (c.1959)
 - Andaman Teal, *Anas albogularis* – formerly included in *Anas gibberifrons*
 - Grey Teal, *Anas gracilis* – formerly included in *Anas gibberifrons*
 - Chestnut Teal, *Anas castanea*



Green-winged Teal, *Anas carolinensis*

- Atlantic/Red-and-green head clade
 - Common Teal, *Anas crecca*
 - Green-winged Teal, *Anas carolinensis* – formerly included in *Anas crecca*
 - Speckled Teal, *Anas flavirostris*
 - Andean Teal, *Anas (flavirostris) andinum*
- New Zealand clade (Placement unresolved)
 - Auckland Islands Teal, *Anas aucklandica*
 - Brown Teal, *Anas chlorotis* – formerly included in *Anas aucklandica*
 - Macquarie Islands Teal, *Anas* cf. *chlorotis* – prehistoric
 - Campbell Island Teal, *Anas nesiotis* – formerly included in *Anas aucklandica*

Subgenus *Melananas* – African Black Duck

- African Black Duck, *Anas sparsa*



Yellow-billed Duck, *Anas undulata*

Subgenus *Anas* – mallard and relatives (may include *Melananas*)

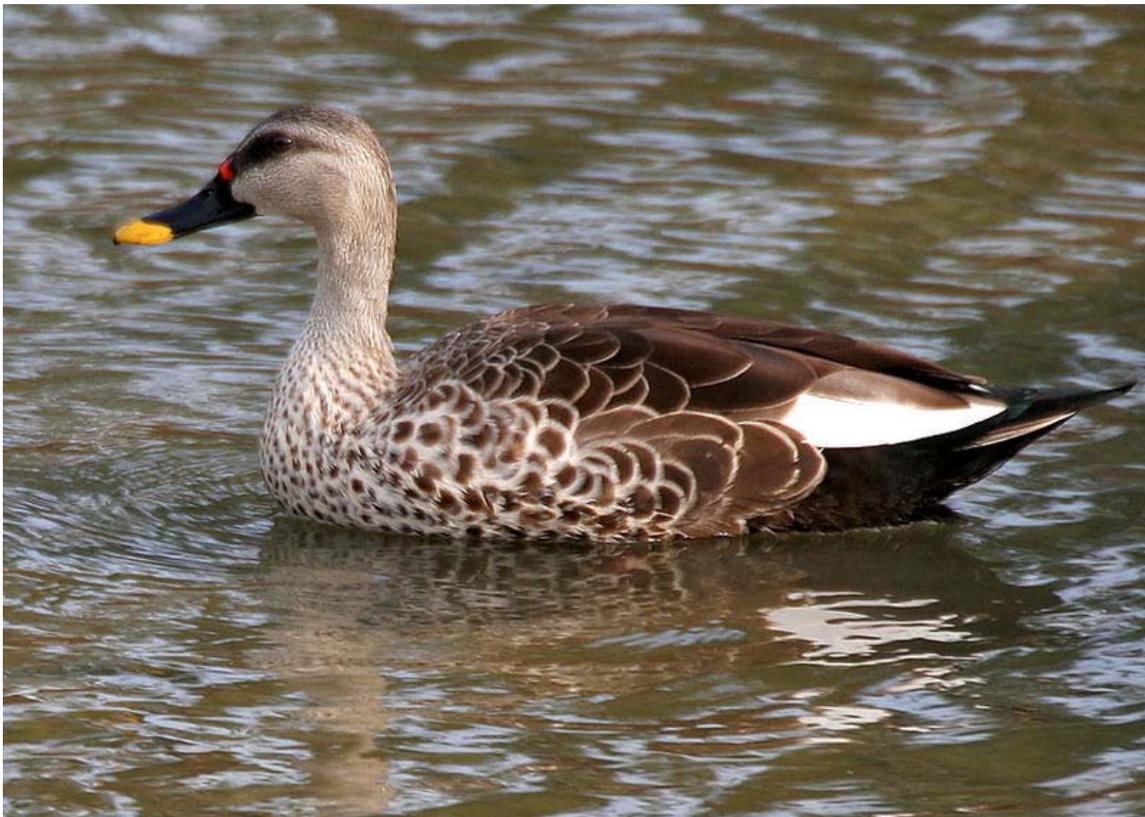
- Basal African species ("*Afranas*")
 - Meller's Duck, *Anas melleri*
 - Yellow-billed Duck, *Anas undulata*



The last male Mariana Mallard, ca. 1980

- American clade
 - Mottled Duck, *Anas fulvigula* – sometimes included in *Anas platyrhynchos*

- Florida Duck, *Anas fulvigula fulvigula* – sometimes included in *Anas platyrhynchos*
 - American Black Duck, *Anas rubripes* – sometimes included in *Anas platyrhynchos*
 - Mexican Duck, *Anas diazi* – sometimes included in *Anas platyrhynchos*
- Pacific clade – the moa-nalos might be derived from this group.
 - Mariana Mallard, *Anas (platyrhynchos) oustaleti* – sometimes considered a subspecies of *Anas superciliosa*; extinct (1981)
 - Hawaiian Duck, *Anas wyvilliana* – sometimes included in *Anas platyrhynchos*
 - Philippine Duck, *Anas luzonica*
 - Laysan Duck, *Anas laysanensis* – sometimes included in *Anas platyrhynchos*
 - Lisianski Duck, *Anas cf. laysanensis* – hypothetical; extinct (c.1845)
 - Pacific Black Duck, *Anas superciliosa*



Spotbill, *Anas poecilorhyncha*

- Ambiguous
 - Mallard, *Anas platyrhynchos*

- Domestic duck, *Anas platyrhynchos domesticus* sometimes *Anas domesticus*
- Spotbill, *Anas poecilorhyncha*
 - Chinese Spotbill, *Anas (poecilorhyncha) zonorhyncha* – sometimes considered a subspecies of *Anas superciliosa*

Formerly placed in *Anas*:

- Bronze-winged Duck, *Speculanas specularis*
- Crested Duck, *Lophonetta specularioides*
- Salvadori's Teal, *Salvadorina waigiuenis*

Fossil record



Pacific Black Duck, *Anas superciliosa*

A number of fossil species of *Anas* have been described. Their relationships are often undetermined:

- *Anas* sp. (Late Miocene of China)
- *Anas* sp. (Late Miocene of Rudabánya, Hungary)
- *Anas greeni* (Ash Hollow Late Miocene?/Early Pliocene of South Dakota, USA) – *Nettion* red-and-green head clade (doubtful)?

- *Anas ogallalae* (Ogalalla Late Miocene?/Early Pliocene of Kansas, USA) – *Nettion* red-and-green head clade (doubtful)?
- *Anas pullulans* (Juntura Late Miocene?/Early Pliocene of Juntura, Malheur County, Oregon, USA) – *Punanetta*?
- *Anas cheuen* (Early-Middle Pleistocene of Argentina) – *Dafila*?
- *Anas bunkerii* (Early -? Middle Pliocene – Early Pleistocene of WC USA) – *Nettion* red-and-green head clade?
- Bermuda Islands Flightless Duck *Anas pachyscelus* (Shore Hills Late Pleistocene of Bermuda, W Atlantic)
- *Anas schneideri* (Late Pleistocene of Little Box Elder Cave, USA)

Several prehistoric waterfowl supposedly part of the *Anas* assemblage are nowadays not placed in this genus anymore, at least not with certainty:

- "*Anas*" *basaltica* (Late Oligocene of "Warnsdorf", Czechia) is apparently an indeterminate heron.
- "*Anas*" *blanchardi*, "*A.*" *consobrina*, "*A.*" *natator* are now in *Mionetta*
- "*Anas*" *creccoides* (Early-mid Oligocene of Belgium), "*A.*" *risgoviensis* (Late Miocene of Bavaria, Germany) and "*A.*" *skalicensis* (Early Miocene of "Skalitz", Czechia), though possibly anseriform, cannot be placed with any certainty among modern birds at all.
- "*Anas*" *albae* (Late Miocene of Polgárdi, Hungary), "*A.*" *eppelsheimensis* (Early Pliocene of Eppelsheim, Germany), "*A.*" *isarensis* (Late Miocene of Aumeister, Germany) and "*A.*" *luederitzensis* (Kalahari Early Miocene of Lüderitzbucht, Namibia) are apparently Anatidae of unclear affiliations; the first might be a seaduck.
- "*Anas*" *integra* and "*A.*" *oligocaena* are now in *Dendrocygna*
- "*Anas*" *robusta* is now tentatively placed in *Anserobranta*
- "*Anas*" *velox* (Middle – Late? Miocene of C Europe) and "*A.*" *meyerii* (Middle Miocene of Öhningen, Germany; possibly the same species) do not seem to belong into the present genus either; they may still turn out to be ancestral dabbling ducks.

Highly problematic, albeit in a theoretical sense, is the placement of the moa-nalos. These are in may be derived from a common ancestor of the Pacific Black Duck, the Laysan Duck, and the Mallard, and an unknown amount of other lineages. Phylogenetically, they may even form a clade within the traditional genus *Anas*. However, as opposed to these species – which are well representative of dabbling ducks in general – the moa-nalos are the most radical departure from the anseriform bauplan known to science. This illustrates that in a truly evolutionary sense, a strictly phylogenetic taxonomy may be difficult to apply.

Chapter 11

Anodorhynchus and Anser (Bird)

Anodorhynchus

Anodorhynchus



Hyacinth Macaw

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Psittaciformes
Family:	Psittacidae
Subfamily:	Psittacinae
Tribe:	Arini
Genus:	<i>Anodorhynchus</i> Spix, 1824

species

- A. glaucus*
- A. hyacinthinus*

A. leari

Anodorhynchus is a genus of large blue macaws from open and semi-open habitats in central and eastern South America. Of the three species in the genus, two are endangered and one is probably already extinct. Additionally, a hypothetical extinct species has been postulated based on very little evidence. At about 100 centimetres (39 in) in length the Hyacinth Macaw is the longest parrot in the world. The three species mainly feed on the nuts from a few species of palms (notably *Acrocomia aculeata*, *Attalea phalerata*, *Butia yatay* and *Syagrus coronata*).

Taxonomy

There are three well established species of the genus, *Anodorhynchus* Spix, 1824:

- Glaucous Macaw, *Anodorhynchus glaucus* (Vieillot, 1816) – probably extinct
- Hyacinth Macaw, *Anodorhynchus hyacinthinus* (Latham, 1790)
- Lear's Macaw or Indigo Macaw, *Anodorhynchus leari* Bonaparte, 1856

Besides the three recognised species, there is the Oné Couli, *Anodorhynchus purpurascens*, which was described by Rothschild and featured in his book, *Extinct Birds* published in 1907, but there is very little evidence to support it as separate species and it should be regarded as a hypothetical extinct species. In the absence of a specimen, Rothschild scientifically described and named it as a separate species based on the evidence that violet macaws were said to have inhabited the island of Guadeloupe; however, they were probably Hyacinth Macaws imported from the mainland of South America.

Species

The three well established species are monotypic:

Species			
Common and binomial names	Image	Description	Range
Glaucous Macaw (<i>Anodorhynchus glaucus</i>)		70 cm (27.5 in) long, mostly pale turquoise-blue with a large greyish head. It has a long tail and a large bill. It has a yellow, bare eye-ring and half-moon-shaped lappets bordering the mandible.	South America (probably extinct)

Hyacinth Macaw
or Hyacinthine
Macaw
(*Anodorhynchus
hyacinthinus*)



100 cm (39 in) long, 120-140 cm (48-56 in) wingspan. It is almost entirely blue and has black under the wings. It has a large black beak with bright yellow along the sides of the lower part of the beak and also yellow eyerings. South America

Lear's Macaw
or Indigo Macaw
(*Anodorhynchus
leari*)



70 cm (27.5 in) long, mainly blue and the head is a slightly paler blue. It has bare pale yellow skin at the base of its beak and orange-yellow eyerings. It has a large blackish beak. Brazil

Anser (bird)

Anser



Greylag Goose, *Anser anser*

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Superorder:	Galloanserae
Order:	Anseriformes
Family:	Anatidae

Subfamily: Anserinae
Tribe: Anserini
Genus: *Anser*
Brisson, 1760

Species

Anser albifrons
Anser anser

- *A. a. anser*
- *A. a. rubrirostris*
- *A. a. domesticus*

Anser brachyrhynchus
Anser caerulescens
Anser canagicus
Anser cygnoides

- *A. c. cygnoides*
- *A. c. domesticus*

Anser fabalis
Anser erythropus
Anser indicus
Anser rossii
Anser serrirostris

Synonyms

Chen Boie, 1822
Cygnopsis Brandt, 1836
Cycnopsis Agassiz, 1846 (emendation)
Eulabeia Reichenbach, 1852
Philacte Bannister, 1870
Heterochen Short, 1970

The waterfowl genus *Anser* includes all **grey geese** and usually the **white geese** too. It belongs to the true geese and swan subfamily (Anserinae). The genus has a Holarctic distribution, with at least one species breeding in any open, wet habitats in the subarctic and cool temperate regions of the Northern Hemisphere in summer. Some also breed further south, reaching into warm temperate regions. They mostly migrate south in winter, typically to regions in the temperate zone between the January 0 °C (32 °F) to 5 °C (41 °F) isotherms.

The genus contains ten living species, which span nearly the whole range of true goose shapes and sizes. The largest is the Greylag Goose at 2.5-4.1 kg (5.5-9 lb) weight, and the smallest is the Ross's Goose at 1.2-1.6 kg. All have legs and feet that are pink, or orange,

and bills that are pink, orange, or black. All have white under- and upper-tail coverts, and several have some extent of white on their heads. The neck, body and wings are grey or white, with black or blackish primary - and also often secondary - remiges (pinions). The closely related "black" geese in the genus *Branta* differ in having black legs, and generally darker body plumage.

Systematics, taxonomy and evolution

Living species and taxonomy

- Swan Goose *Anser cygnoides* - sometimes separated in *Cygnopsis*
- Taiga Bean-Goose *Anser fabalis*
- Tundra Bean-Goose *Anser serrirostris*
- Pink-footed Goose *Anser brachyrhynchus*
- White-fronted Goose *Anser albifrons*
 - Greenland White-fronted Goose *Anser (albifrons) flavirostris*
- Lesser White-fronted Goose *Anser erythropus*
- Greylag Goose *Anser anser*

- Bar-headed Goose *Anser indicus* - sometimes separated in *Eulabeia*

- Snow Goose *Anser caerulescens* - sometimes separated in *Chen*
- Ross's Goose *Anser rossii* - sometimes separated in *Chen*
- Emperor Goose *Anser canagicus* - sometimes separated in *Chen* or *Philacte*

The white geese are sometimes separated as the genus *Chen*, with one of them sometimes split off in the genus *Philacte*. They cannot be distinguished anatomically, there is some evidence of a distinct lineage in evaluations of molecular data. While most ornithological works traditionally include *Chen* within *Anser*, the AOU and the IUCN are notable authorities which treat them as separate.

Some authorities also treat some subspecies as distinct species (notably Tundra Bean Goose) or as likely future species splits (notably Greenland White-fronted Goose).

Fossil record

Numerous fossil species have been allocated to this genus. As the true geese are near-impossible to assign osteologically to genus, this must be viewed with caution. It can be assumed with limited certainty that European fossils from known inland sites belong into *Anser*. As species related to the Canada Goose have been described from the Late Miocene onwards in North America too, sometimes from the same localities as the presumed grey geese, it casts serious doubt on the correct generic assignment of the supposed North American fossil geese. The Early Pliocene *Branta howardae* is one of the cases where doubts have been expressed about its generic assignment. Similarly, *Heterochen* = *Anser pratensis* seems to differ profoundly from other species of *Anser* and

might be placed into a different genus; alternatively, it might have been a unique example of a grey goose adapted for perching in trees.

- *Anser atavus* (Middle/Late Miocene of Bavaria, Germany) - sometimes in *Cygnus*
- *Anser arenosus* (Big Sandy Late Miocene of Wickieup, USA)
- *Anser arizonae* (Big Sandy Late Miocene of Wickieup, USA)
- *Anser cygniformis* (Late Miocene of Steinheim, Germany)
- *Anser oeningensis* (Late Miocene of Oehningen, Switzerland)
- *Anser thraceiensis* (Late Miocene/Early Pliocene of Trojanovo, Bulgaria)
- *Anser pratensis* (Valentine Early Pliocene of Brown County, USA) - possibly separable in *Heterochen*
- *Anser pressus* (Glenns Ferry Late Pliocene of Hagerman, USA) - formerly *Chen pressa*
- *Anser thompsoni* (Pliocene of Nebraska)
- *Anser azerbaijanicus* (Early? Pleistocene of Binagady, Azerbaijan)

The Maltese swan *Cygnus equitum* was occasionally placed into *Anser*, and *Anser condoni* is a synonym of *Cygnus paloregonus*. A goose fossil from the Early-Middle Pleistocene of El Salvador is highly similar to *Anser*. Given its age it is likely to belong to an extant genus, and biogeography indicates *Branta* as other likely candidate.

?*Anser scaldii* (Late Miocene of Antwerp, Belgium) may be a shelduck.

Relationship with humans and conservation status

Two species in the genus are of major commercial importance, having been domesticated as poultry: European domesticated geese are derived from the Greylag Goose, and Chinese and some African domesticated geese are derived from the Swan Goose.

Most species are hunted to a greater or lesser extent; in some areas, some populations are endangered by over-hunting. Most notably, the Lesser White-fronted Goose is listed by IUCN as Vulnerable throughout its range, and due to overhunting and rampant habitat destruction, the population of the Swan Goose is on the verge of collapsing, leading to a listing as Endangered.

Other species have benefitted from reductions in hunting since the late 19th/early 20th centuries, with most species in western Europe and North America showing marked increases in response to protection. In some cases, this has led to conflicts with farming, when large flocks of geese graze crops in the winter.

Chapter 12

Aphelocoma

Aphelocoma



A Western Scrub Jay (*Aphelocoma californica*)

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Passeriformes
Family:	Corvidae
Genus:	<i>Aphelocoma</i> Cabanis, 1851

Species

Aphelocoma californica
Aphelocoma coerulescens
Aphelocoma insularis
Aphelocoma ultramarina
Aphelocoma unicolor

The passerine birds of the genus *Aphelocoma* include the **scrub-jays** and relatives. They are New World jays found in Mexico, western Central America and the western United States, with an outlying population in Florida. This genus belongs to the group of New World (or "blue") jays—possibly a distinct subfamily—which is not closely related to other jays, magpies or treepies (Ericson *et al.*, 2005). They live in open pine-oak forests, chaparral, and mixed evergreen forests

Systematics



Florida Scrub-Jay, *Aphelocoma coerulescens*

Five species of *Aphelocoma* are generally recognized currently, since two taxa formerly treated as races of *A. coerulescens* were recently split off as separate species (*A. californica* and *A. insularis*); the 3 now separate species differ in color and bill size. They are believed to have evolved in the Pleistocene, and the Floridan species is known to have been recognizably distinct and present in its current range for at least 2 million years (Emslie, 1996). Indeed, the inland and coastal populations of *A. californica* seem to constitute 2 distinct species too, as might different populations of the Mexican Jay (Rice *et al.* 2003).

- Unicolored Jay, *Aphelocoma unicolor* – cloudforests of southern Mexico east to Honduras
- Mexican Jay or Gray-breasted Jay, *Aphelocoma ultramarina* – Sierra Madre Oriental and Sierra Madre Occidental mountains of Mexico, north to southeast Arizona, southwest New Mexico and westernmost Texas, US.
- Island Scrub-Jay, *Aphelocoma insularis* – Santa Cruz Island off southern California

- Western Scrub-Jay, *Aphelocoma californica*
 - California Scrub-Jay, *Aphelocoma [californica] californica* – coastal western North America from Washington to Baja California
 - Woodhouse's Scrub-Jay, *Aphelocoma [californica] woodhouseii* - inland western North America, from Oregon through Texas and south to northern interior Mexico
 - Sumichrast's Scrub-Jay, *Aphelocoma [californica] sumichrasti* - inland Mexico from Guerrero and Tlaxcala to Oaxaca
- Florida Scrub-Jay, *Aphelocoma coerulescens* – Florida

mtDNA NADH dehydrogenase subunit 2 sequence data (Rice *et al.* 2003) is unable to properly resolve the relationships of the species. Judging from New World jay biogeography, the Unicolored or Mexican Jays might represent the most basal lineage; morphology would tentatively lean towards the latter which retains more of the group's color patterns, while the available molecular data allows no robust conclusions whatsoever. In any case, the data of Rice *et al.* (2003) suggests - albeit also with very low confidence - that the Mexican Jay comprises 2 clades which might constitute different species. However, far too few individuals have been sampled to say anything definite on that matter, except that the lineages - if they indeed exist - do not correspond to the geographical pattern of intraspecific variation.

On the other hand, it is somewhat more likely that the Western Scrub-Jay is made up of 2 species. These would be separated by the Great Basin, with the Pacific coastal lineage ("California" Scrub-Jay) and the Island Scrub-Jay, as well as the inland lineage ("Woodhouse's" Scrub-Jay) and the Florida Scrub-Jay being sister species. This treatment fails to address the problem of birds from inland southern Mexico. What is known about the paleogeography of North America supports these findings, but they must be considered preliminary pending analysis of much more data (Rice *et al.* 2003). Nonetheless, it is actually *because* the molecular diversity pattern is so badly resolved that it supports the view that rapid Late Pliocene radiation of the North American Scrub-Jays led to the present diversity. Recent studies on the evolutionary history of *Aphelocoma* jays suggests that all New World jays originated in North America or Mesoamerica (Bonaccorso and Peterson, 2007).

Appearance

Aphelocoma jays are slightly larger than the Blue Jay and differ in having a longer tail, slightly shorter, more rounded wings, and no crest on the head. The top of the head, nape, and sides of the head are a rich deep blue. Some species have a white stripe above the eye and dark ear coverts. The breast is also white or grey-white and the back is a grey-brown contrasting with the bright blue tail and wings in most species. One species, Unicolored Jay, is blue all over, superficially similar to the Pinyon Jay from much further north. The bill, legs, and feet are black.

Habitat

Scrub-jays are frequently seen in the Los Angeles Basin.

Behavior



Juvenile Florida Scrub-Jay at Blue Spring State Park, Florida

Food is taken both on the ground and in trees. Acorns and pine nuts are the most important foods, making up the great bulk of the diet, with grain, berries and other fruits making up the rest of the vegetable diet. Many insects and other invertebrates are also taken, and eggs and nestlings, small frogs, mice and reptiles.

Wild *Aphelocoma* jays are frequent visitors at campsites and picnics and have frequently learned to eat from the hands of people where they have become accustomed to being fed.

The nest is in a tree or a bush, sometimes quite low down. The nests are compact and lined with hair and fine roots with an outer diameter of about 30 cm to 60 cm. Usually 2 to 4 eggs are laid and incubated over 14 to 16 days. There are two main variations of egg shell color: green with olive markings or a paler background of grayish-white to green with red-brown markings. The Florida Scrub-Jay and the Mexican Jay both have

cooperative breeding systems involving several 'helpers' at each nest, usually relatives of the breeding pair.

Increased prolactin in the breeding pair leads to the expression of parental behavior and physiology (Brown and Vleck, 1998). The source of the alloparental behavior found in helper birds has been the focus of many studies. Recently, a positive correlation between increased prolactin levels during the breeding period and helping behavior in non-breeding *Aphelocoma* jays was found (Brown and Vleck, 1998). This suggests that helper birds do not simply respond to the calls of the young, but begin to show parental behavior even before the chicks hatch. These data suggest that natural selection may be acting on [Cooperative breeding] in *Aphelocoma* jays and New World jays in general because the birds are reacting to more than just an environmental stimulus. Studies have also been done on Florida scrub-jays (*Aphelocoma coerulescens*) and results have confirmed the hypothesis that increased prolactin levels are correlated with an increase in parental behavior in helper birds (Schoech, 1998).

Aphelocoma jays are quite vocal and have a huge range of sounds and calls; common calls include a *cheek, cheek, cheek* and a guttural churring *kr'r'r'r'r*. *Aphelocoma* jays are also, like all other jays, often quite aggressive, and antagonistic at feeding areas, and sometimes regarded as a nuisance.

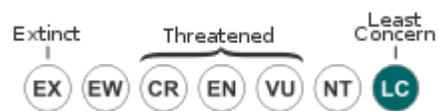
Chapter 13

Apostlebird

Apostlebird



Conservation status



Least Concern (IUCN 3.1)

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Passeriformes

Family: Corcoracidae
Genus: *Struthidea*
Gould, 1837
Species: *S. cinerea*

Binomial name

Struthidea cinerea
Gould, 1837

The **Apostlebird** (*Struthidea cinerea*), also known as the **Grey Jumper**, is a quick-moving, gray or black bird about 13 inches (33 centimetres) long. It is a native to Australia where it roams woodlands, eating insects and seeds at, or near, ground level. Apostlebirds often travel in groups of about 12; for this reason they were named after the Biblical apostles, the twelve chief followers of Jesus Christ.

Taxonomy



Originally described by ornithologist John Gould in 1837, its specific epithet is Latin *cinerea* "grey". In its own genus *Struthidea*, it is placed in the family known as the mud-nest builders or Corcoracidae, written as Grallinidae in older books before the removal of the genus *Grallina* to the Wagtail family. It is one of two remaining species, with the White-winged Chough (*Corcorax melanorhamphos*), which differs in appearance but exhibits many behavioural similarities. The mudnest builder family Corcoracidae itself is now placed in a narrower "Core corvine" group, which contains the crows and ravens, shrikes, birds of paradise, fantails, monarch flycatchers, and drongos.



The Apostlebird was named after the Biblical apostles, the twelve followers of Jesus Christ. In fact, the species travel in family groups of between 6 and 20, which may coalesce with other family groups into large feeding flocks of over 40. Their gregarious nature, and harsh scolding/grating calls have led to a plethora of colloquial names. They can be known locally as *Lousy Jacks* (due to heavy louse infestations), *Happy Jacks*, *Happy Families* and *CWA Birds*. The latter name is mildly derogatory, referring to the supposed resemblance of Apostlebird's constant chatter to a Country Women's Association meeting. *Grey Jumper* is an alternate name.

Description

Measuring around 33 cm (13 in) in length, the Apostlebird is a predominantly dark grey bird with a long black tail tinted greenish in sunlight. The grey feathers on the head, neck and breast are brushed with paler grey-white and the wings are brownish. The legs and bill are black and the eyes brown or white.

Distribution and habitat

The natural range is across inland eastern Australia, from the mallee regions of northern Victoria and eastern South Australia, north through New South Wales and central-western Queensland to the Gulf Country. There is an isolated population in the Northern

Territory. Dry open woodland is the preferred habitat, especially *Callitris* in New South Wales and *Casuarina* in Queensland, and Lancewood-Bulwaddi communities in the Northern Territory.

Breeding



Mud nest high in a Kurrajong tree

Apostlebirds are a socially living, cooperative breeding species with each breeding group generally containing only one breeding pair, the rest being either their helper offspring, kin or unrelated adult birds. Most group members help construct a mud nest, share in incubation of the eggs, and defense of the nest. Once the eggs are hatched, all members of the group help feed the chicks and keep the nest clean.

Apostlebirds are a fission-fusion society. In winter, birds flock in larger groups, and as breeding season approaches winter groups break into smaller breeding groups. This change in group size is a consequence of breeding groups merging in the winter and breaking apart again in the summer breeding season. Breeding groups use small, non overlapping home ranges around the nest site, while winter ranges are larger with groups freely interacting with other groups.

Breeding season is from August to December. The nest is a deep cup-shaped structure made of grasses held together with mud or sometimes manure in a tree fork up to seven

or eight metres above the ground. Three to five pale blue-white eggs sparsely splotched with brown and lavender shades are laid measuring 22 mm x 29 mm. They are tapered oval in shape.

Conservation status

Apostlebirds are not listed as threatened on the Australian Environment Protection and Biodiversity Conservation Act 1999. However, their conservation status varies from state to state within Australia. For example:

- The Apostlebird is listed as **threatened** on the Victorian Flora and Fauna Guarantee Act (1988). Under this Act, an *Action Statement* for the recovery and future management of this species has not yet been prepared.
- On the 2007 advisory list of threatened vertebrate fauna in Victoria, the Apostlebird is not listed as a threatened species.

Chapter 14

Kiwi

Kiwi



A North Island brown kiwi

Scientific classification

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Struthioniformes (or
Apterygiformes)

Family: **Apterygidae**
Gray, 1840

Genus: ***Apteryx***
Shaw, 1813

Species

Apteryx haastii Great Spotted Kiwi

Apteryx owenii Little Spotted Kiwi

Apteryx rowi Okarito Brown Kiwi

Apteryx australis Brown Kiwi

Apteryx mantelli North Island Brown Kiwi

Synonyms

Apterynx [*sic*] Swainson 1837
Stictapteryx Iredale & Mathews 1926
Kiwi Verheyen 1960

Kiwi are flightless birds endemic to New Zealand, in the genus *Apterynx* and family **Apterygidae**.

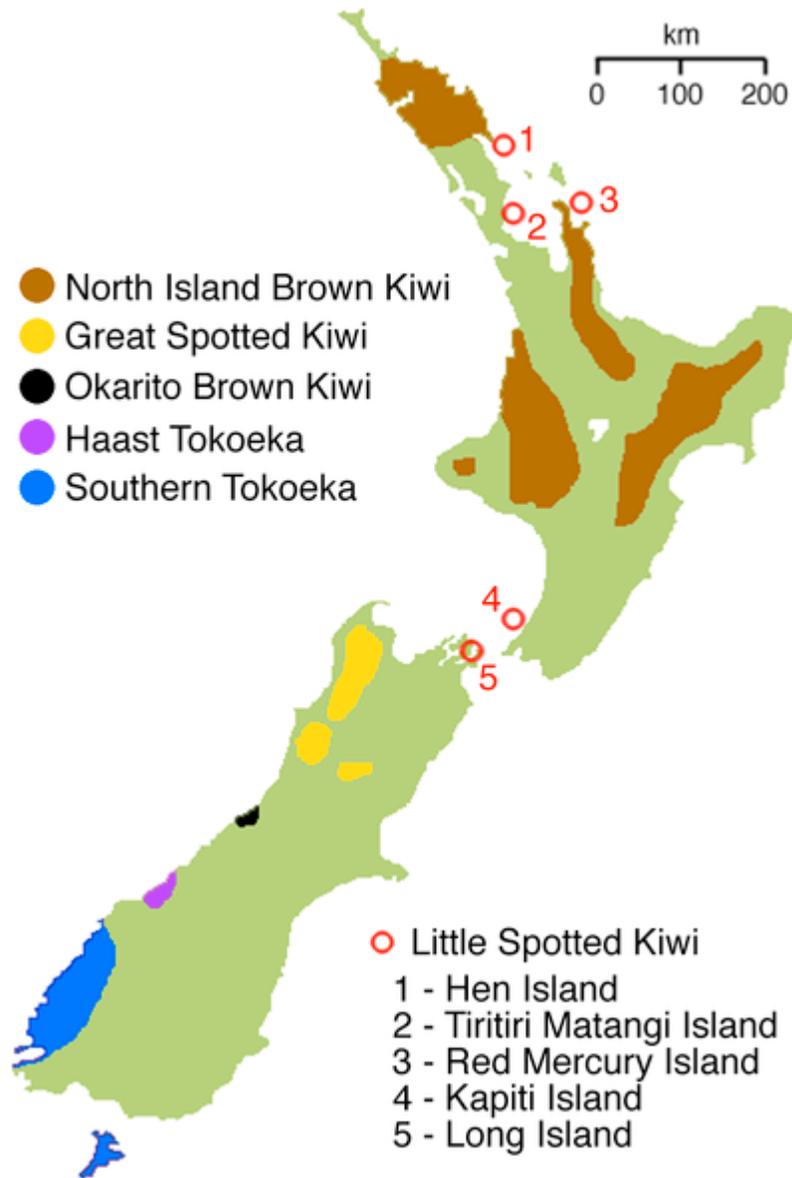
At around the size of a domestic chicken, kiwi are by far the smallest living ratites and lay the largest egg in relation to their body size of any species of bird in the world. There are five recognised species, all of which are endangered; all species have been adversely affected by historic deforestation but currently large areas of their forest habitat are well protected in reserves and national parks. At present, the greatest threat to their survival is predation by invasive mammalian predators.

The kiwi is a national symbol of New Zealand – indeed, the association is so strong that the term *Kiwi* is used, all over the world, as the colloquial demonym for New Zealanders.

Species

There are five accepted species of kiwi (one of which has four sub-species), plus one to be formally described.

- The largest species is the **Great Spotted Kiwi** or **Roroa**, *Apterynx haastii*, which stands about 45 cm (18 in) high and weighs about 3.3 kg (7.3 lb). (Males about 2.4 kg (5.3 lb)) It has grey-brown plumage with lighter bands. The female lays just one egg, which both parents then incubate. Population is estimated to be over 20,000, distributed through the more mountainous parts of northwest Nelson, the northern West Coast, and the Southern Alps.
- The very small **Little Spotted Kiwi**, *Apterynx owenii* is unable to withstand predation by introduced pigs, stoats and cats, which have led to its extinction on the mainland. About 1350 remain on Kapiti Island and it has been introduced to other predator-free islands and appears to be becoming established with about 50 'Little Spots' on each island. A docile bird the size of a bantam, it stands 25 cm (9.8 in) high and the female weighs 1.3 kg (2.9 lb). She lays one egg which is incubated by the male.



The distribution of each species of kiwi



Clockwise from left : Brown Kiwi (*Apteryx australis*), Little Spotted Kiwi (*Apteryx owenii*) and Great Spotted Kiwi (*Apteryx haastii*) at Auckland War Memorial Museum

- The **Rowi**, also known as the **Okarito Brown Kiwi** or *Apteryx rowi*, first identified as a new species in 1994, is slightly smaller, with a greyish tinge to the plumage and sometimes white facial feathers. Females lay as many as three eggs in a season, each one in a different nest. Male and female both incubate. Distribution of these kiwi are limited to a small area on the west coast of the South Island of New Zealand, however studies of ancient DNA have revealed that in prehuman times it was far more widespread up the west coast of the South Island and was present in the lower half of the North Island where it was the only kiwi species detected.
- The **Tokoeka**, *Apteryx australis*, relatively common species of kiwi known from south and west parts of the South Island that occurs at most elevations. It is

- approximately the size of the **Great Spotted Kiwi** and is similar in appearance to the **Brown Kiwi** but its plumage is lighter in colour. Ancient DNA studies have shown that in prehuman times the distribution of this species included the east coast of the South Island. There are several subspecies of the Tokoeka recognised:
- The **Stewart Island Tokoeka**, *Apteryx australis lawryi*, is a subspecies of **Tokoeka** from Stewart Island.
 - The **Northern Fiordland Tokoeka** (*Apteryx australis* ?) and **Southern Fiordland Tokoeka** (*Apteryx australis* ?) live in the remote southwest part of the South Island known as Fiordland. These sub-species of Tokoeka are relatively common and are nearly 40 cm (16 in) tall.
 - The **Haast Tokoeka**, *Apteryx australis 'Haast'*, is the rarest subspecies of kiwi with only about 300 individuals. It was identified as a distinct form in 1993. It only occurs in a restricted area in the South Island's Haast Range of the Southern Alps at an altitude of 1,500 m (4,900 ft). This form is distinguished by a more strongly downcurved bill and more rufous plumage.
 - The **North Island Brown Kiwi**, *Apteryx mantelli* or *Apteryx australis* before 2000 (and still in some sources), is widespread in the northern two-thirds of the North Island and, with about 35,000 remaining, is the most common kiwi. Females stand about 40 cm (16 in) high and weigh about 2.8 kg (6.2 lb), the males about 2.2 kg (4.9 lb). The North Island Brown has demonstrated a remarkable resilience: it adapts to a wide range of habitats, even non-native forests and some farmland. The plumage is streaky red-brown and spiky. The female usually lays two eggs, which are incubated by the male.

Analysis of mitochondrial DNA, ecology, behaviour, morphology, geographic distribution and parasites of the North Island Brown Kiwi has led scientists to propose that the Brown Kiwi is three distinct species. The North Island Brown Kiwi; the Okarito Brown Kiwi (Rowi), whose distribution is restricted to a single site on the West Coast of the South Island of New Zealand; and a third distinct population of the North Island Brown Kiwi, the Southern Tokoeka, distributed in the lowland forest to the north of Franz Josef glacier in the South Island and on Stewart Island/Rakiura, with a small population near Haast being another possibly distinct species, the Haast Tokoeka.

Biology

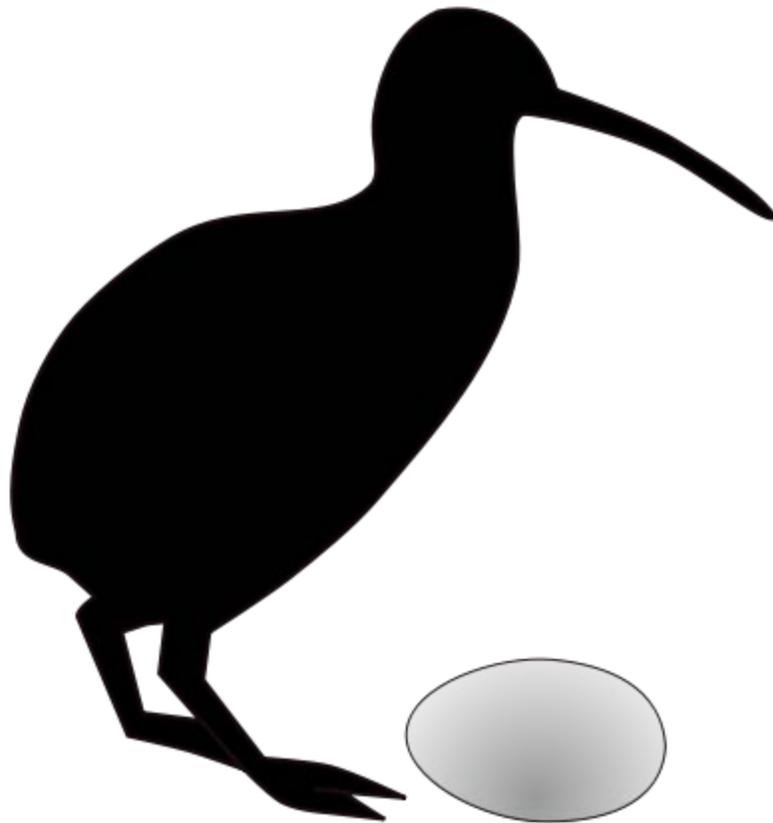
Evolution

It was long presumed that the kiwi was closely related to the other New Zealand ratites, the moa. However, recent DNA studies indicate that the Ostrich is more closely related to the moa and the kiwi is more closely related to the Emu and the cassowaries. This theory suggests that the ancestors of the kiwi arrived in New Zealand from elsewhere in Australasia well after the moa. According to British scientists, the kiwi may be an ancient import from Australia. Researchers at Oxford University have found DNA evidence connected to Australia's Emu and the Ostrich of Africa. Upon examining DNA from the moa, they believe that the kiwi is more closely related to its Australian cousins.

Behaviour and ecology

Before the arrival of humans in the 13th century or earlier, New Zealand's only endemic mammals were three species of bat, and the ecological niches that in other parts of the world were filled by creatures as diverse as horses, wolves and mice were taken up by birds (and, to a lesser extent, reptiles).

Kiwi are shy and usually nocturnal. Their mostly nocturnal habits may be a result of habitat intrusion by predators, including humans. In areas of New Zealand where introduced predators have been removed, such as sanctuaries, kiwi are often seen in daylight. They prefer subtropical and temperate podocarp and beech forests, but they are being forced to adapt to different habitat, such as sub-alpine scrub, tussock grassland, and the mountains. Kiwi have a highly developed sense of smell, unusual in a bird, and are the only birds with nostrils at the end of their long beak. Kiwi eat small invertebrates, seeds, grubs, and many varieties of worms. They also may eat fruit, small crayfish, eels and amphibians. Because their nostrils are located at the end of their long beaks, Kiwi can locate insects and worms underground without actually seeing or feeling them, due to their keen sense of smell.



Relative size of the egg

Once bonded, a male and female kiwi tend to live their entire lives as a monogamous couple. During the mating season, June to March, the pair call to each other at night, and meet in the nesting burrow every three days. These relationships may last for up to 20 years. They are unique among other birds in that they have a functioning pair of ovaries. Kiwi eggs can weigh up to one quarter the weight of the female. Usually only one egg is laid per season. The kiwi lays the biggest egg in proportion to its size of any bird in the world, so even though the kiwi is about the size of a domestic chicken, it is able to lay eggs that are about six times the size of a chicken's egg. Eggs are smooth in texture, and are ivory or green-ish white. The male incubates the egg, except for the Great spotted kiwi, *A. haastii*, where both parents are involved. The incubation period is 63–92 days. Producing the huge egg places a lot of demands on the female. For the thirty days it takes to grow the fully developed egg the female must eat three times her normal amount of food. Two to three days before the egg is laid there is little space left inside the female for her stomach and she is forced to fast.

Morphology

Their adaptation to a terrestrial life is extensive: like all ratites they have no keel on the breastbone to anchor wing muscles, and barely any wings. The vestiges are so small that they are invisible under the bristly, hair-like, two-branched feathers of the kiwi. While birds generally have hollow bones to minimise weight and make flight practicable, kiwi have marrow, in the style of mammals. With no constraints on weight due to flight requirements, some Brown Kiwi females carry and lay a single 450 g (16 oz) egg. Like most other ratites, they have no preen gland. Their bill is long, pliable, and sensitive to the touch, and their eyes have a reduced pecten. Their feathers lack barbules, and aftershafts, and they have large vibrissae around the gape. They have 13 flight feathers, no tail, just a small pygostyle. Finally, their gizzard is weak and their caecum is long and narrow.

Relationship with humans



The Kiwi on a 1898 New Zealand stamp.

Kiwi and Māori

The Māori traditionally believe that kiwi are under the protection of Tane Mahuta, god of the forest. Kiwi feathers are particularly important to Māori, as they are used for kahu-kiwi – ceremonial cloaks. Today, while kiwi feathers are still used, they are gathered from kiwi that die naturally or through road accidents or predation, and Māori no longer hunt kiwi, but consider themselves their guardians.

Discovery and documentation

The first kiwi specimen to be studied by Europeans was a kiwi skin brought to George Shaw by Captain Andrew Barclay aboard the ship *Providence*, who was reported to have been given it by a sealer in Port Jackson (Sydney Harbour) around 1811. George Shaw gave the kiwi its scientific name and drew sketches of the way he imagined a live bird to look which appeared as plates 1057 and 1058 in volume 24 of *The Naturalist's Miscellany* in 1813.

Zoos

In 1851, London Zoo became the first zoo to keep kiwi. The first captive breeding took place in 1945. As of 2007 only 13 zoos outside New Zealand hold kiwi. The Frankfurt Zoo has 12, the Berlin Zoo has 7, Walsrode Bird Park has 1, the Avifauna Bird Park in the Netherlands has 3, the San Diego Zoo has 5, the San Diego Wild Animal Park has 1, the Smithsonian National Zoological Park has 5, the Smithsonian Conservation Biology Institute has 1 and the Columbus Zoo and Aquarium in Columbus, Ohio has 3.

Etymology

The Māori language word *kiwi* is generally accepted to be "of imitative origin" from the call. However, linguists derive the word from Proto-Nuclear Polynesian **kiwi*, which refers to *Numenius tahitiensis*, the Bristle-thighed Curlew, a migratory bird that winters in the tropical Pacific islands. With its long decurved bill and brown body, the curlew resembles the Kiwi. So when the first Polynesian settlers arrived, they simply reused the word for the new-found bird. The genus name *Apteryx* is derived from Ancient Greek "without wing": *a-*, "without" or "not"; *pteryx*, "wing".

As a national symbol

The kiwi as a symbol first appeared in the late 19th century in New Zealand regimental badges. It was later featured in the badges of the South Canterbury Battalion in 1886 and the Hastings Rifle Volunteers in 1887. Soon after, the kiwi appeared in many military badges, and in 1906 when Kiwi Shoe Polish was widely sold in the UK and the USA the symbol became more widely known.

During the First World War, the name "kiwi" for New Zealand soldiers came into general use, and a giant kiwi, (now known as the Bulford Kiwi), was carved on the chalk hill above Sling Camp in England. Use has now spread so that now all New Zealanders overseas and at home are commonly referred to as "kiwis".

The kiwi has since become the most well-known national symbol for New Zealand, and the bird is prominent in the coat of arms, crests and badges of many New Zealand cities, clubs and organisations.

The New Zealand dollar is often referred to as "the kiwi dollar".

Programs for saving endangered Kiwi

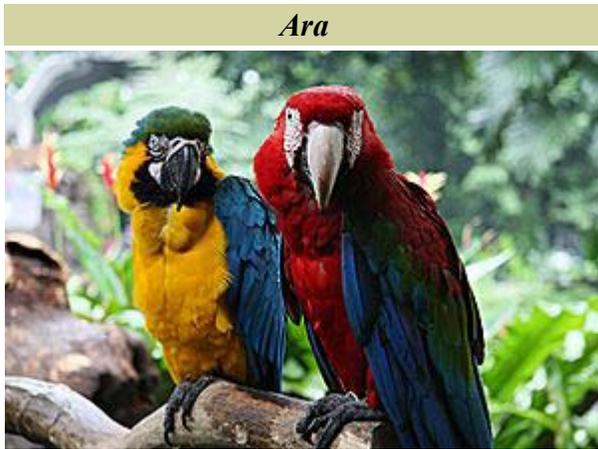
To protect the endangered Kiwi, a number of trusts and protection programs have been set up.

These include:

- BNZ save the Kiwi Trust
- Otanewainuku Kiwi Trust
- Rainbow Springs
- Karori Wildlife Sanctuary Trust
- Moehau Environment Group

Chapter 15

Ara (Genus)



Blue-and-yellow Macaw (left) and Green-winged Macaw (right) at Jurong BirdPark, Singapore

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Psittaciformes
Family:	Psittacidae
Subfamily:	Psittacinae
Tribe:	Arini
Genus:	<i>Ara</i> Lacepede, 1799

Ara is a Neotropical genus of macaws with eight extant species and at least two extinct species. The genus name was coined by French naturalist Bernard Germain de Lacépède in 1799. It gives its name to and is part of the Arini, or tribe of Neotropical parrots. The *Ara* macaws are large striking parrots with long tails, long narrow wings and vividly coloured plumage. They all have a characteristic bare face patch around the eyes. Males

and females have similar plumage. Many of its members are popular in the pet trade, and bird smuggling is a threat to several species.

Taxonomy

For many years the genus *Ara* contained a number of other species. Three genera have been split out from the genus, *Orthopsittaca*, *Primolius* and *Diopsittaca*. *Orthopsittaca* and *Diopsittaca* are two monotypic genera that were morphologically and behaviourally different, whereas the three *Primolius* macaws are three smaller green macaws.

Species and subspecies



Green-winged Macaw at Brookfield Zoo, USA

There are eight surviving species and one extinct species. The last confirmed sighting of the extinct Cuban Red Macaw was in 1864 when one was shot. Several skins of the Cuban Red Macaw are preserved in museums, but none of its eggs have survived.

The *Ara* genus is subdivided as follows:

- Blue-and-yellow Macaw, *Ara ararauna* (Linnaeus, 1758)
- Blue-throated Macaw, *Ara glaucogularis* Dabbene, 1921
- Military Macaw, *Ara militaris* (Linnaeus, 1766)
 - *Ara militaris bolivianus* Reichenow, 1908
 - *Ara militaris mexicanus* Ridgway, 1915
 - *Ara militaris militaris* (Linnaeus, 1766)
- Great Green Macaw or Buffon's Macaw, *Ara ambiguus* (Bechstein, 1811)
 - *Ara ambiguus ambiguus* (Bechstein, 1811)
 - *Ara ambiguus guayaquilensis* Chapman, 1925
- Scarlet Macaw, *Ara macao* (Linnaeus, 1758)
 - *Ara macao cyanopterus* Wiedenfeld, 1995
 - *Ara macao macao* (Linnaeus, 1758)
- Green-winged Macaw or Red-and-green Macaw, *Ara chloropterus* Gray, 1859
- †Cuban Red Macaw, *Ara tricolor* Bechstein, 1811 (extinct: last known individual shot in 1864)
- Red-fronted Macaw, *Ara rubrogenys* Lafresnaye, 1847
- Chestnut-fronted Macaw or Severe Macaw, *Ara severus* (Linnaeus, 1758)
- †Saint Croix Macaw, *Ara autocthonos* Wetmore, 1937 (extinct, known from subfossil bones)

Hypothetical extinct species

Several hypothetical extinct species of the *Ara* genus have been postulated based on very little evidence. They may have been subspecies, or familiar parrots that were imported onto an Island and later presumed to have a separate identity.

- Martinique Macaw, *Ara martinica* (Rothschild, 1905)
- Red-tailed Blue-and-yellow Macaw, *Ara erythrura* (Rothschild, 1907)
- Lesser Antillean Macaw, *Ara guadeloupensis* Clarke, 1905
- Jamaican Green-and-yellow Macaw, *Ara erythrocephala* Gosse, 1847
- Jamaican Red Macaw, *Ara gossei* Rothschild, 1905
- Dominican Green-and-yellow Macaw, *Ara atwoodi* Clarke, 1905

Morphology and appearance



Like the rest of the genus the wings of the Blue-and-yellow Macaw are long, as is the tail

The *Ara* macaws are large parrots ranging from 46–51 cm (18–20 in) in length and 285 to 287 g (10 oz) in weight in the Chestnut-fronted Macaw to 90–95 cm (35–37 in) 1708 g (60 oz) in the Green-winged Macaw. The wings of these macaws are long and narrow which is typical for species of parrot which travel long distances in order to forage. They have a massive downward curved upper mandible and a patch of pale skin around the eye that extends to base of the beak. The skin patch bears minute feathers arranged in lines that form a pattern over the otherwise bare skin in all species of the genus except the Scarlet Macaw in which the skin is bare. In most species the bill is black, but the Scarlet Macaw and Green-winged Macaw have a predominantly horn coloured upper mandible and a black lower one.

The colours in the plumage of the *Ara* macaws are spectacular. Four species are predominately green, two species are mostly blue and yellow, and three species (including the extinct Cuban Macaw) mostly red. There is no sexual dimorphism in the plumage, and that of the juveniles is similar to adults, although slightly duller in some species.

Distribution and habitat



Four Green-winged Macaws flying in Peru

The *Ara* macaws have a Neotropical distribution from Mexico to Argentina. The centre of *Ara* distribution is the Amazon Basin and the Panama-Colombia border-region; each with as many as four species found together (marginally five where the Military Macaw approach the western Amazon). Seven species are found in Bolivia, but no single locality in that (or any other) country surpasses four species. The most widespread species, the Scarlet Macaw, is (or was) distributed throughout large parts of Central America and the Amazon. On the other hand the Blue-throated Macaw and the Red-fronted Macaw have tiny distributions in Bolivia. The overall range of many species and the genus as a whole has declined in historical times due to human activities. The Military Macaw is distributed from northern Mexico to northern Argentina, but the distribution is discontinuous, with populations in Mexico, a large gap, then a population in the Venezuelan Coastal Range and a population along the Andes from western Venezuela to northern Argentina. The Blue-and-yellow Macaw was extirpated from Trinidad in the 1960s, as well as retreating from northern Argentina, and several species apparently went extinct in the islands of the Caribbean.

The *Ara* macaws are generally fairly adaptable in their habitat requirements; this reaches its extreme in the Scarlet Macaw, which as suggested in its widespread distribution, uses most habitat types from humid rainforest to open woodlands to savannah. The only requirement is sufficient large trees, which is where they obtain their food and breeding holes. The other species are slightly more narrow in their habitat choices, but the need for

large trees is universal. The Blue-throated Macaw generally inhabits forest "islands" in the savanna, and the Red-fronted Macaw prefers arid scrub and cactus woodland.

Within their range, birds may travel widely seasonally in search of food. They do not undertake large scale migrations, but instead more local movements amongst a range of different habitats.

Feeding and diet



Chestnut-fronted Macaws, Mealy Amazons and Dusky-headed Parakeets at a clay lick in Ecuador

Like all macaws and most parrots seeds and fruit are the major part of the diet of the genus *Ara*. The particular species and range of diet varies from species to species. Unlike many birds macaws are seed predators not seed dispersers, and use their immensely strong beaks to open even the hardest shells. Their diet overlaps with that of some monkey species; in one study of Green-winged Macaws in Venezuela they shared many of the same trees as bearded sakis, although in some cases they ate the seeds at an earlier stage of ripeness than the sakis, when they contained more poison. Macaws, like other parrots, may consume clay to absorb toxic compounds produced by some poisonous seeds they eat. As well, the toxic compounds of some foods may be neutralized by compounds, such as tannins, found in other foods consumed at the same time.

Breeding

Like almost all parrots, the *Ara* macaws are cavity nesters. The majority of species nest in cavities in trees, either a live or dead. Natural holes in trees may be used, particularly those in dead trees, otherwise holes created by other species; in Mexico Military macaws still use the cavities excavated by the now critically endangered Imperial Woodpecker. In addition to nesting in trees the Military Macaw and Green-winged Macaw will also nest in natural fissures in cliffs. This nesting habitat is the only one used by the Red-fronted Macaws, as sufficiently large enough trees are absent in its arid range.

Species

<i>Ara</i>			
Common and binomial names	Image	Description	Range
Great Green Macaw or Buffon's Macaw (<i>Ara ambiguus</i>)		85–90 cm (33–36 in) long. Mostly green, red on forehead, green and blue wings	Central and South America, from Honduras to Ecuador
Blue-and-yellow Macaw or Blue-and-gold Macaw (<i>Ara ararauna</i>)		80–90 cm (31.5–35.5 in) long. Mostly blue back and yellow front. Blue chin and green forehead. The upper zone of the bare white skin around each eye extending to the beak is patterned by lines of small dark feathers.	Panama, Colombia through to south-central Brazil.
Green-winged Macaw or Red-and-green Macaw (<i>Ara chloroptera</i>)		90 cm (36 in) long. Mostly red, with blue and green wings. The bare white skin around each eye extending to the bill is patterned by lines of small red feathers.	South America, from Colombia through to northern Paraguay (formerly northern Argentina)

Blue-throated
Macaw
(*Ara
glaucogularis*)



75–85 cm (30–34 in) long. Blue upperparts and mostly yellow lowerparts, blue throat. Areas of pale skin on the sides of the face are covered with lines of small dark-blue feathers, with pinkish bare skin at the base of the beak.

North Bolivia

Scarlet Macaw
(*Ara macao*)



81–96 cm (32–36 in) long. Mostly bright red, with red, yellow and blue in the wings. There is bare white skin around the each eye extending to the bill.

Mexico to
Colombia and
the Amazon
Basin.

Military Macaw
(*Ara militaris*)



70 cm (28 in) long. Mostly green, red forehead

Discontinuous
distribution in
Mexico and
along the
Andes from
Venezuela to
north
Argentina.

Red-fronted
Macaw
(*Ara rubrogenys*)



55–60 cm (21.5–23.5 in) long. Mostly green. red forehead and red patch over the ears, pinkish skin on the face, red at bend of wings, blue primary wing feathers

Central Bolivia

Chestnut-fronted
Macaw
or Severe Macaw
(*Ara severa*)



46 cm (18 in) long. Mostly green, chestnut forehead, red at bend of wings

Panama and
South America
in the Chocó
and Amazon
Basin

†Cuban Red Macaw
(*Ara tricolor*)
Extinct 1864



50 cm (20 in) long. Red forehead fading to orange and then to yellow at the nape of the neck, dark brown bill paler at the tip; orange face, chin, chest, abdomen and thighs; upper back mainly brownish red, and the rump and lower back blue; brown, red and purplish-blue wing feathers; upper surface of the tail was dark red fading to blue at the tip, and brownish red underneath.

Extinct - formerly endemic on Cuba and probably also on Isla de la Juventud (previously called the Isle of Pines).

†Saint Croix Macaw
(*Ara autocthonos*)
Extinct

Unknown appearance

Only known from sub-fossil bones found at two archeological sites; Saint Croix, U.S. Virgin Islands and central Puerto Rico.

Extinct - unknown former range

Hypothetical extinct Ara

Hypothetical extinct species			
Common and binomial names	Image	Description	Range
†Jamaican Green-and-yellow Macaw or Red-headed Green Macaw (<i>Ara erythrocephala</i>) Extinct		length unknown. Red head, bright green body, blue wings and greater coverts. scarlet tail and blue on top, whereas the tail and wings were intense orange-yellow underneath	Jamaica
†Red-tailed Blue-and-yellow Macaw (<i>Ara erythrura</i>) Extinct		length unknown. Blue and yellow. Rothschild's book Extinct Birds (1907) of <i>Ara erythrura</i> shows the tail tipped with blue on the color plate, while the text described it as "entirely red."	Jamaica or Martinique

†Jamaican Red
Macaw
or Gosse's
Macaw
(*Ara gossei*)
Extinct



length unknown. Similar to the
Cuban Red Macaw. Major
difference: yellow forehead

Jamaica

†Martinique
Macaw
(*Ara martinica*)
Extinct



length unknown. Blue and orange-
yellow (saffron). Similar to *Ara*
ararauna.