HELM FIELD GUIDES

# Birds of Argentina

## and the South-west Atlantic

Mark Pearman & Juan Ignacio Areta

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# ARGENTINA
## AND THE SOUTH-WEST ATLANTIC

*Dedicated to Alejandra, Ian and Luca, and Mecky, Simona and Ainara,*

*and to all Argentine ornithologists and birders*

*In memory of Harry Pearman and Pacho Centeno*

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# Birds of ARGENTINA AND THE SOUTH-WEST ATLANTIC

Mark Pearman and Juan Ignacio Areta

Illustrated by
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Richard Johnson and Alan Harris

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# BOOK PLAN AND AIMS OF THE BOOK

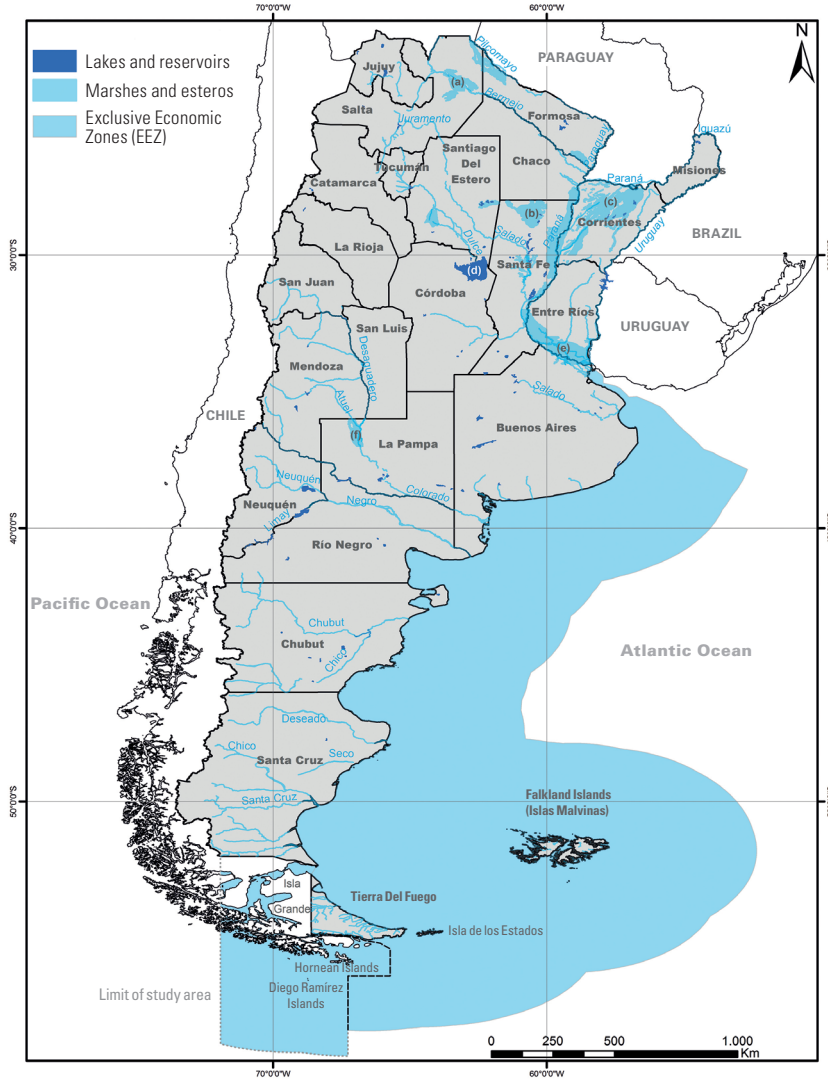
The book consists of two volumes: **Volume 1 (Field guide)** and **Volume 2 (Identification, natural history, distribution and taxonomy)**. Volume 1 is a light, field-friendly guide that contains illustrated plates and accompanying succinct texts focused on bird identification, as well as distribution maps. Volume 2 forms the bulk of the work and is a detailed account of identification at subspecific level, describing the differences between similar species and providing behavioural and vocal data, as well as giving the status and distribution of every taxon, the worldwide species range, the global conservation status, and taxonomic notes.

The main aims of these two volumes are:

- To provide detailed descriptions of all species and subspecies occurring in the region, combined with a user-friendly synthesis of diagnostic features and comparisons of potential confusion species.
- To describe, define and depict the current and historical distribution, altitudinal range and relative abundance of all bird taxa known in the region, on a provincial and maritime scale, with special emphasis on the complex migratory patterns.
- To provide accurate illustrations of all species together with subspecies, colour morphs and age-related plumages which differ to the extent that they might cause confusion or promote certain interest.
- To provide relevant taxonomic notes with sourced references and a synthesis of possible future updates.
- To provide a comprehensive dataset on behaviour and voice, partially drawn from published material and partially from the authors' own field research.
- To describe the habitat preferences for every species, and provide a detailed illustrated account of ecosystems and habitats.
- To provide the first detailed synthesis of breeding data for all species in the region.

# AREA COVERED BY THE BOOK

This book has been compiled from a biological, ornithological and non-political, perspective and covers a single biogeographical unit, namely continental Argentina, associated Fuegian and subantarctic islands (including those belonging to other countries) and the maritime Exclusive Economic Zones associated with these regions. The EEZs extend 200 nautical miles from land, their boundaries entering the Drake Passage in the far south. The foremost region covered includes the twenty-three provinces of the Republic of Argentina (Map 1), representing the eighth largest country in the world.




Map 1. Boundaries and hydrography
This map delimits the area covered by the book, the international and provincial boundaries of Argentina, and shows the major rivers and water bodies. Key: (a) Bañados del Quirquincho, (b) Bajos Submeridionales, (c) Esteros del Iberá, (d) Laguna de Mar Chiquita and Bañados del Río Dulce, (e) Paraná Delta and (f) Bañados del Atuel.

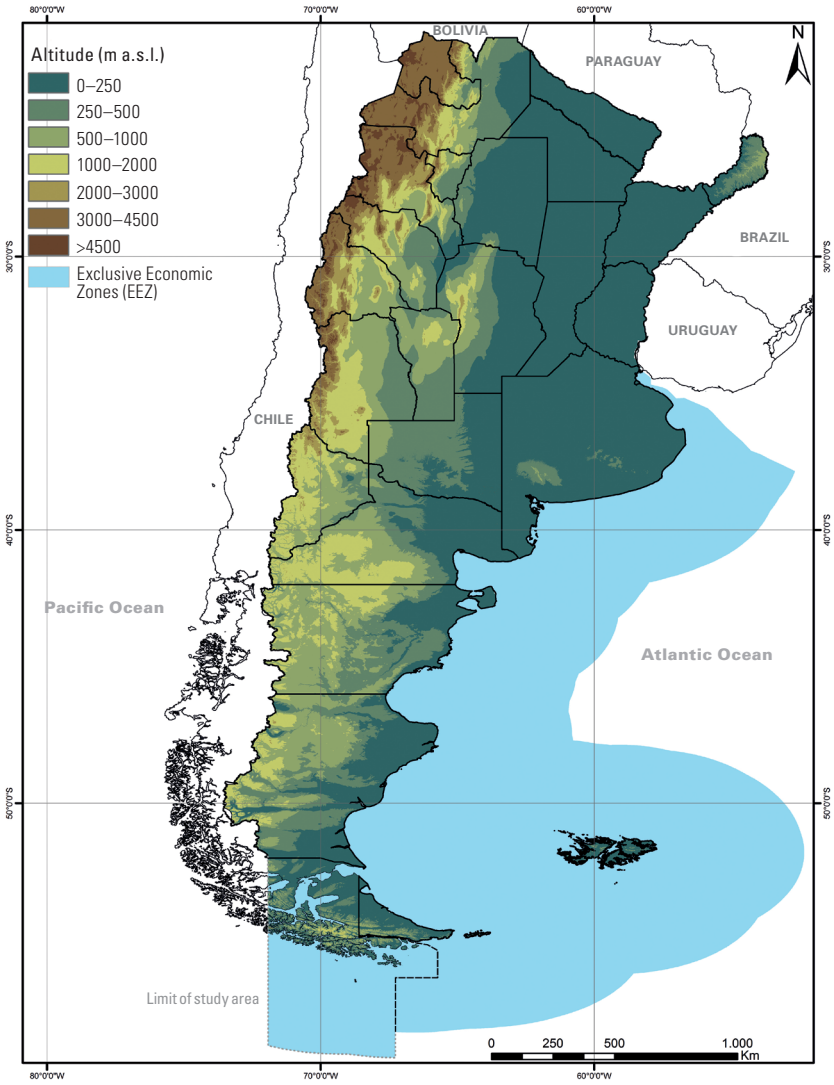
The subantarctic islands included are all adjacent to the continent and either comprise undisputed Argentine territory, or are otherwise claimed by, inhabited by or disputed between Argentina, the United Kingdom or Chile. The Islas de los Estados (or Staten Islands) lying south-east of Isla Grande represent an outstanding and ornithologically important inclusion. The remaining Atlantic islands of Tierra del Fuego, to the south of Isla Grande and belonging to Chile, are also covered. These include all islands in the Beagle Channel and, in particular, the Hornean islands complex including Wollaston, Amarilla, Hoste and Cabo de Hornos (Cape Horn) islands; which extend the Chilean EEZ further south as a consequence. These islands represent an intrinsic component of the Fuegian avifauna in that some species are largely restricted to the Hornean island group, and only occasionally reach Isla Grande. Other Atlantic islands such as Evout and Barnevelt and the remote Diego Ramírez (Chile) have received little attention, but are covered here (Map 1) because of their important breeding seabird populations, details of which have been published in little-known journals, and have been rarely documented in the mainstream literature.

Within the defined oceanic boundary, the only offshore island group in addition to the several more remote islands mentioned above, are the Falkland Islands (Map 1) which lie 490 km east of southern Patagonia. The name given to this archipelago differs in the Argentine Spanish language in that they are known as the *Islas Malvinas* or more simply *Las Malvinas*. Since this is an English language edition, we considered it appropriate to use the English name for these islands and localities within the island group. A forthcoming Spanish edition will use Argentine names. While there is an indisputable link between the avifaunal and botanical composition between Tierra del Fuego, Isla de los Estados, the Hornean group and the Falkland Islands at family and generic level, other islands to the east and south, e.g. South Georgia, South Sandwich, South Orkney and South Shetland, have extremely weak ornithological links and share virtually no botanical links. These are devoid of all but one land bird: South Georgia Pipit *Anthus antarcticus*, a typical representative of a cosmopolitan genus that recent molecular phylogenetic work suggests may be just a subspecies of the widespread Correndera Pipit *Anthus correndera*, and it is excluded here. Numerous species of seabirds breed on islands to the south of the Antarctic convergence, with a few breaching both sides, and as such this is usually regarded as a natural biological barrier. The oceanic and island coverage in this book therefore relates exclusively to a single biogeographic area, which is explicitly related to the continental avifauna of Argentina and its adjacent maritime region.

It should also be noted that the Antarctic islands and the Antarctic Peninsula have already received much ornithological exploration resulting in many detailed books and publications, not to mention their location in a completely distinct continent. Their inclusion here would have meant considerable additional research, deferring from the title of this work and its original concept. Nevertheless, many Antarctic species have occurred as vagrants inside our study area and hence their inclusion. Ultimately, the species coverage in this book includes almost 100% of bird species from Uruguay, in addition to approximately 86% of the Chilean avifauna and 93% of the Paraguayan avifauna.

# GEOGRAPHY AND HYDROGRAPHY

The Republic of Argentina ranges from sea-level to the highest peak in the Americas, Aconcagua with its 6961 m peak also representing the highest mountain in the Western Hemisphere and Southern Hemisphere. Two main geographical features characterise the Argentine landscape; the **Andean Cordillera** and the **Chaco/Pampean plain** (Map 2). The Cordillera de los Andes extends throughout the western flank of Argentina from north to south for more than 3700 km. Numerous peaks extend over 6300 m above sea-level, from Jujuy in the north to Mendoza (e.g. Volcán Llullaillaco, Nevado de Cachi, Volcán Ojos del Salado, Monte Pissis, Cerro Bonete, Cerro Mercedario), while several active volcanoes are found from northern Neuquén



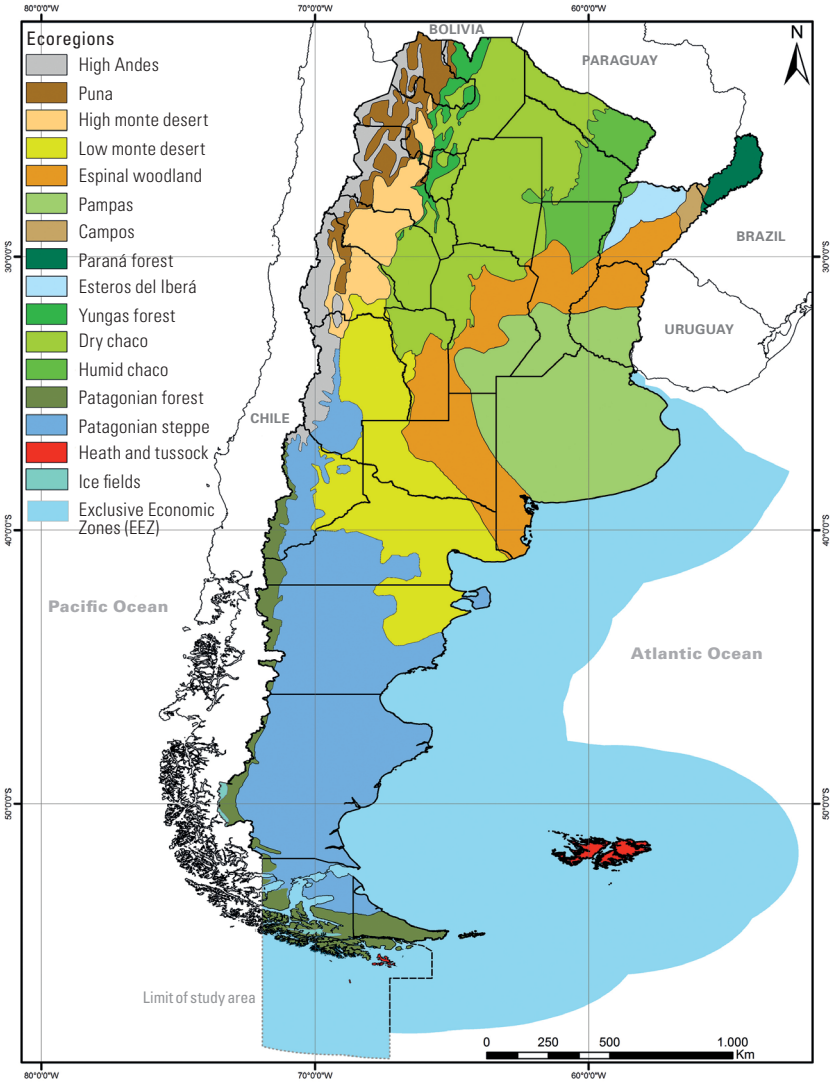

Map 2. Geography
This map shows the relief of Argentina and the study area.

to the south (Volcán Domuyo, Volcán Copahue and Volcán Lanín), from where the Cordillera decreases progressively in height as it crosses Tierra del Fuego and terminates on Isla de los Estados. To the east of the southern Andes buttress, the landscape is dominated by desertic *mesetas* (table-top mountains), of which the Meseta de Somuncurá in central Río Negro and the mesetas of Santa Cruz province should be highlighted. Several extra-Andean ranges rise either from near the Andes (the Subandean ranges) or further inland (the Pampean ranges). The **Subandean ranges** are of biogeographic importance for birds, as it is here that some endemic species occur (Sierra de Santa Bárbara/Cresta del Gallo, Sierras de Medina/Castillejos, Serranía del Aconquija, Serranía de Ambato/Ancasti and Sierra de Velasco). The **Chaco/Pampean plain** inclines mostly to the southeast spanning 1.2 million km² encompassing the chaco, Pampas, Espinal, Esteros del Iberá and Campos ecoregions. In this vast flat area, the **Pampean ranges** of the Sierras de Córdoba together with the Sierras de San Luis (the Central Sierras) harbour several endemic species and subspecies. Other important ranges are the Sierra de Guasayán, rising in the western portion of the dry chaco, and the Sierra de Ventania in the southern Pampas. The northeast and central portions of Paraná forest also experience drastic avifaunal changes despite the relative low altitude (maximum of 1000 m) of local mountain ranges.

The complex topography of Argentina results in a similarly complex hydrography (Map 1). The **Rio de la Plata basin** is the second largest in South America; its main tributaries, the Paraguay, Paraná and Uruguay rivers run essentially from north to south. The Paraná and Uruguay rivers constitute important biogeographic corridors and biogeographic breaks, and jointly delimit the region known as **Mesopotamia** which includes the provinces of Misiones, Corrientes and Entre Ríos, from north to south. The Delta of the Paraná river extends for 14,000 km² and for some 320 km from Entre Ríos province to the Rio de la Plata estuary (see Pampas ecoregion below). The Bermejo river traverses the chaco region from west to east, while the parallel Pilcomayo is interrupted in the middle portion; these sinuous, meandering rivers flow into the Paraguay river and are characterised by the presence of oxbow lakes known as *madrejones*. An important tributary of the Paraná river is the Río Salado (Salado del Norte or Juramento), beginning in the high Andes above 5000 m in the Calchaqui valley, Salta and representing the longest river in the country. In central Argentina, the **Rio Desaguadero basin** collects water from the San Juan, Mendoza, Tunuyán and Atuel rivers, reaching the sea only intermittently during exceptional floods. The flooding of the Atuel and Desaguadero rivers form the *bañados del Atuel*. Further south, the **Patagonian system** includes several independent rivers that run west to east into the sea, and include the Colorado, Río Negro, Chubut and Santa Cruz rivers. Most basins drain to the Atlantic Ocean, but a few Patagonian rivers (e.g. Hua Hum, Manso, Puelo and Futaleufú) drain through Chile into the Pacific slope. **Endorheic basins** give rise to extensive salt flats or large saltwater bodies. Among the latter, the Laguna de los Pozuelos (Jujuy province) and the vast Laguna de Mar Chiquita (Córdoba province) covering 2000 km², deserve special mention for the number of waterbirds, and especially waders, that they harbour in spring and autumn. The Río Dulce is the main affluent of Laguna de Mar Chiquita and forms the *bañados del Río Dulce* to the north of the lake.

# ECOREGIONS AND HABITATS

The distribution of birds in Argentina is intrinsically linked to the major ecoregions on the mainland and subantarctic islands in the south-west Atlantic (Map 3). The distribution of these ecoregions is heavily influenced by mountainous regions and climatic factors. Most of these ecoregions contain a variety of distinct habitats. Floristic composition varies from a relatively low diversity in the Puna and Patagonian steppe, to a highly complex one in the chaco, Yungas and Paraná forests, but this diversity does not strictly reflect the diversity of the avifauna. Most ecoregions and habitats grade into one another forming ecotones, and some even contain flora from disjunct regions. A schematic representation of the distribution of ecoregions




Map 3. Ecoregions
This map defines the main ecoregions of Argentina and the study area.

(Map 3) showcases the general distributional patterns. At a more local scale, patches of habitat from some ecoregions may occur locally embedded in others. Thus, the distribution of ecoregions should be used as a general aid to birdwatching, bearing in mind that local settings may vary substantially from the general map, while taking into account the size of the area that is covered. The Southern Patagonian ice field covering 19,500 km² is devoid of vegetation and is not further discussed (see Map 3).

After describing the principal floral composition of each ecoregion and habitat, the endemic bird species and genera are mentioned for each habitat, together with any other noteworthy species. Note that a large variety of native flora is illustrated on the plates (see Appendix 5). The flora taxonomy employed follows that of *Flora Argentina* (1997–2017) published by the Instituto de Botánica Darwinion.

## PUNA AND HIGH ANDES

(**Habitats**: Pre-puna, Puna brush-steppe, Tola heath, Puna grasslands, Andean grass-steppe, sierran grasslands)

The dry Andean slopes above the Yungas forest range from 2000 to 3400 m in Jujuy and Salta south to La Rioja (descending to 1000 m) and are classed as **Pre-puna**, becoming intermixed and grading into the Monte Desert. The dominant vegetation of Pre-puna is formed by leguminous bushes such as Pichana *Senna crassirame*, and composite shrubs such as *Aphyllocladus spartioides* and *Gochnatia glutinosa*. Certain sectors are dominated by cacti including stands of giant columnar Cardón del Valle *Trichocereus terschekii* reaching 12 m in height, and the smaller Pasacán *T. pasacana*, Airampu *Tunilla soehrensii*, and a variety of other cacti including *Opuntia tilcarensis*, *Parodia maassii* and the low spherical *Lobivia formosa*. Some rivers harbour low woodlands of Visco *Acacia visco*, thorny Churqui *Prosopis ferox*, Chilca *Baccharis salicifolia* and Molle *Schinus areira*. The highest slopes only have a sparse cover of bromeliads (*Deuterocohnia brevifolia*, *D. lorentziana*) and *Tillandsia bryoides*. Typical bird species include Brown-backed Mockingbird *Mimus dorsalis* and Rusty-vented Canastero *Asthenes dorbignyi*, while the endemic Moreno's Ground Dove *Metriopelia morenoi* is almost exclusively found in rocky areas in Pre-puna.

Above the Pre-puna is a flat desert known as Puna or 'altiplano', extending from southern Peru across northern Chile and western Bolivia into northwest Argentina. This arid landscape alternates between brush- and grass-steppe. **Puna brush-steppe** is dominated by Tolilla *Fabiana densa*, Añagua *Adesmia horrida*, Chijúa *Baccharis boliviensis* and Tola *Parastrephia* spp. **Puna grasslands** are dominated by *Festuca orthophylla* bunchgrass and climax grasses of the genera *Festuca*, *Pennisetum*, *Bouteloua*, *Eragrostis* and *Aristida*. Bird species diversity is relatively low but a number of exclusive species include Puna Tinamou *Tinamotis pentlandii*, Puna Miner *Geositta punensis* and Puna Yellow Finch *Sicalis lutea*. Boulders and rocks covered with cushion-plants, especially *Frankenia triandra,* form a microhabitat for Red-backed Sierra Finch *Idiopsar dorsalis*. In striking contrast, lakes and wetlands in the Puna region are lined with *Zameioscirpus atacamensis*, *Juncus stipulatus* and *Eleocharis quinqueflora*, and support a large and varied avifauna including many Puna specialties e.g. Andean Goose *Oressochen melanopterus*, Puna Ibis *Plegadis ridgwayi*, Puna and Andean Flamingos *Phoenicoparrus jamesi* and *P. andinus*, Horned, Giant and Andean Coots *Fulica cornuta, F. gigantea, F. ardesiaca*, and Andean Avocet *Recurvirostra andina*. From San Juan to Santa Cruz and above the tree-line in Tierra del Fuego, vegetation is more sparse although **Andean grass-steppe** dominates in certain areas with several compact bushes.

Above the tree-line from 1500 to 3000 m in the sierras of Córdoba, San Luis, Catamarca, La Rioja and western Santiago del Estero, the **sierran grasslands** are composed of a variety of grasses of the genera *Stipa*, *Festuca*, *Digitaria*, *Diplachne*, *Trichloris*, *Pappophorum* and *Elionurus*. These grasslands also have sparse bush cover with Chilca *Eupatorium buniifolium* and Piquillín *Condalia microphylla*, also *Senna*, *Berberis* and *Baccharis* spp. among others. In the Central Sierras, the habitat supports the endemic Córdoba Cinclodes *Cinclodes comechingonus* and Sierran Meadowlark *Leistes* [*loyca*] *obscura*, and another 11 endemic subspecies accepted here.

## MONTE DESERT

(**Habitats**: low monte desert, high monte desert)

The Monte desert is the only ecosystem which is strictly endemic to Argentina, and this is reflected by a number of endemic bird species, endemic breeders and other species shared only between the monte and the adjacent dry chaco or Patagonian steppe. Monte desert is an arid steppe ecosystem with very low rainfall, sandy soils and is dominated by thorn bushes. It forms a band which commences in the arid northern intermontane Andean valleys and is bordered by Pre-puna and dry chaco woodlands, and in the south intergrades with Espinal woodland and Patagonian steppe. The Monte desert strip extends from Salta through Tucumán, Catamarca, La Rioja, San Juan, north-west San Luis, Mendoza, western La Pampa, eastern Neuquén, Río Negro and north-east Chubut. The dominant flora comprises three species of low thorny Creosote bushes (*Larrea divaricata*, *L. nitida* and *L. cuneifolia*) which have small yellow flowers. These are usually intermixed with other xerophytic bushes and stunted trees which rarely exceed three metres in height, and include the green-barked Brea *Cercidium praecox*, Retamo *Bulnesia retama*, various algarrobos including *Prosopis flexuosa* and *P. alpataco*, Chañar *Geoffroea decorticans*, Molle *Schinus fasciculatus*, Piquillín *Condalia microphylla*, Mata Sebo *Monttea aphylla*, Monte Negro *Bougainvillea spinosa*, Pichana *Senna aphylla*, and Chirriadora *Chuquiraga erinacea*. A large variety of cacti are found (e.g. *Opuntia sulphurea*, *O. anacantha*, *Pterocactus*, *Tephrocactus* and *Trichocereus* spp.) while grassland communities are represented by *Aristida*, *Bouteloua*, *Pappophorum*, *Eragrostis*, *Stipa*, *Hordeum*, *Bromus*, etc. Sand dune formations are frequent throughout the monte. In the south, the **low monte desert** extends mostly over a vast plain while in the north the **high monte desert** is mostly distributed as narrower strips of habitat surrounded by mountains.

Bird species diversity is low, compared to all other wooded or forested habitats in Argentina. However, five species are completely endemic to Argentina: White-throated Cacholote *Pseudoseisura gutturalis*, Steinbach's Canastero *Pseudasthenes steinbachi*, Sandy Gallito *Teledromas fuscus,* Carbonated Sierra Finch *Rhopospina carbonaria* and Monte Yellow Finch *Sicalis mendozae*. There are another five endemic breeding species: Black-crowned Monjita *Neoxolmis coronata*, Hudson's Black Tyrant *Knipolegus hudsoni*, Straneck's Tyrannulet *Serpophaga griseicapilla*, White-banded Mockingbird *Mimus triurus* and Cinnamon Warbling Finch *Poospiza ornata*. Finally, three other species are almost exclusively found in the Monte desert, but may also breed in adjoining Patagonian steppe: Patagonian Canastero *Pseudasthenes patagonica*, Rusty-backed Monjita *Neoxolmis rubetra* and Lesser Shrike-Tyrant *Agriornis murina*.

## YUNGAS

(**Habitats**: *Polylepis* woodlands, *Podocarpus* forest, alder forest, cloud forest, transitional foothill forest)

The Yungas includes a complex and varied number of montane forest types ranging mostly from 400 to 2600 m on the Andean slopes of Jujuy, Salta, Tucumán, Catamarca and adjacent La Rioja province with an outlying sector on the Sierra de Guasayán, Santiago del Estero, where Yungas forest grades into sierran chaco woodlands. There is a marked decline in floral and faunal diversity from north to south, and also dramatic variation in composition by altitude. The forest is contiguous only with similar forests in southern Bolivia. ***Polylepis* woodlands** are representative of the highest altitude trees in the world, occurring at and above the usual tree-line, mainly along river gorges, and also forming isolated habitat within the Puna grass-steppe. *Polylepis australis* extends sparsely in northern Salta and Jujuy (at 1900–3000 m) and reappears in the sierras of Córdoba and San Luis, while *P. tomentella* occurs at 2400–4300 m in Jujuy only. Exclusive bird species include Tawny Tit-Spinetail *Sylviorthorynchus yanacensis* and Giant Conebill *Conirostrum binghami*, although many other bird species have strong ties. Two other high altitude Yungas trees have a somewhat localised distribution and each may be dominant in certain areas, forming monospecific woodlands. ***Podocarpus* forest** *P. parlatorei* occurs from 1500 to 2000 m, providing a seasonal food source for Tucumán Amazon *Amazona tucumana*, and is also inhabited by local species such as Smoky-brown Woodpecker *Dryobates fumigatus*, Fulvous-headed Brushfinch *Atlapetes fulviceps*, and the fairly specialised Buff-banded Tyrannulet

*Mecocerculus hellmayri*. Alder forest *Alnus acuminata* is somewhat more widespread (from 1300 to 2500 m) and is inhabited by Tucumán Amazon, and forms typical, but not exclusive, habitat for the near-endemic Tucumán Mountain Finch *Poospiza baeri* and the endemic White-browed Tapaculo *Scytalopus superciliaris* and Yellow-striped Brushfinch *Atlapetes citrinellus*. It also lines the rivers on which Rufous-throated Dipper *Cinclus schulzi* can most frequently be encountered.

The floristic composition becomes subtropical, complex and dense below 1600 m and descends the Andean slope mainly to 550 m. The mid- and upper elevation forest is classed as cloud forest because it is shrouded in cloud cover in summer and autumn. The dominant trees are the endemic 30–40 m-high Horco Molle *Blepharocalyx salicifolius*, the 25 m-high endemic Laurel de la Falda *Cinnamomom porphyria* (usually heavily laden with epiphytes), the 15–30 m-high Nogal Criollo *Juglans australis* and, among others, the Cedro Tucumano or Coya *Cedrela lilloi*, Cedro Salteño *C. balansae*, Saúco *Sambucus peruviana*, Horco-Cebil *Parapiptadenia excelsa*, Lapacho Amarillo *Tabebuia lapacho* and Carnaval *Senna spectabilis*. Humid areas support extensive stands of *Chusquea lorentziana* bamboo and *Alsophila odonelliana* tree-ferns. This sector of Yungas forest holds the highest bird species diversity. The entire Yungas forest system is home to some 18 species which can be considered endemic to Bolivia and Argentina. However, species distribution is by no means uniform since the forest is divided into a number of semi-connected and unconnected blocks which follow major Andean and extra-Andean chains and sierras. Representative Yungas birds include Red-faced Guan *Penelope dabbenei*, Yungas Guan *Penelope bridgesi*, Blue-capped Puffleg *Eriocnemis glaucopoides*, Slender-tailed Woodstar *Microstilbon burmeisteri*, Hoy's Screech Owl *Megascops hoyi*, Spot-breasted Thornbird *Phacellodomus maculipectus*, Sclater's Tyrannulet *Phyllomyias sclateri*, Rufous-browed Warbling Finch *Microspingus erythrophrys* and Fulvous-headed Brushfinch *Atlapetes fulviceps*.

The lower slopes of the Yungas from 400 to 700 m are mostly covered with foothill forest which shares floristic characters with the Caatinga of Brazil and the guajira of NE Colombia and NW Venezuela. Here, the dominant trees include the Tipa Blanca *Tipuana tipu*, a Yungas endemic reaching 40 metres, the 30 m-high Palo Blanco *Calycophyllum multiflorum*, the endemic 20–30 m-high Lapacho Rosado *Tabebuia impetiginosa,* Urundel *Astronium urundeuva*, Roble Criollo *Amburana cearensis*, Jacarandá *Jacaranda mimosifolia* and Quina *Myroxylon peruiferum*. This basal forest is not a transition between dry chaco woodlands and Yungas forest but has instead been invaded by some chaco flora only in recent times, e.g. the Palo Amarillo *Phyllostylon rhamnoides* and the 30 m-high Pacará *Enterolobium cortotisiliquum* which are widespread chaco trees. Virtually all of the foothill forest from 400 to 550 m has been clear-felled for sugar cane, citrus and tobacco plantations. The avifauna mostly comprises Yungas forest species, but some typical lowland chaco species, such as Cream-backed Woodpecker *Campephilus leucopogon* and Great Rufous Woodcreeper *Xiphocolaptes major*, also occur and ascend the Andean slopes.

## INTER-ANDEAN DRY VALLEYS

(Habitats: *Polylepis* forest, dry shrub, low cactus beds, Aguaribay woodland)

An impoverished version of the Inter-Andean Dry Valleys of Bolivia extends into a very short and narrow section of NW Argentina in extreme nc. Salta, centred around the town of Santa Victoria, north to the Bolivian border and south possibly slightly beyond Punco Viscana. These valleys range from 2200 to 3200 m and are dry by virtue of the rain shadow created from the west by the high Sierra de Santa Victoria range and from the east by lower mountain chains with luxuriant Yungas cloud forest. The deep gorges are characterised by sparse forests of *Polylepis tomentella*, while the drier valley slopes harbour a diversity of small cacti, sparse shrub cover and generally isolated Aguaribay *Schinus areira* trees. Small-scale farming is widespread. Despite its restricted distribution in Argentina, this ecoregion is ornithologically relevant. The very sparse woods that grow alongside rivers harbour a small population of Bolivian Woodpeckers *Dryobates* [*lignarius*] *puncticeps*; sparse shrubs on steep rocky slopes are inhabited by Bolivian Earthcreeper *Tarphonomus harterti*, while Bolivian Warbling Finch *Poospiza boliviana* and a white-browed form of Azara's Spinetail *Synallaxis azarae* are also found. The only reports of Cliff Parakeet *Myiopsitta* [*monachus*] *luchsi* come from this area.

## CHACO

(**Habitats**: Dry chaco woodlands, sierran chaco woodlands, humid chaco woodlands, forest islands in savanna, palm savanna, gallery forest)

One of the largest ecoregions in Argentina are the mainly low-lying thorn woodlands known as the chaco (of which Chaco province itself only forms a small part) and which also extends over western Paraguay and south-eastern Bolivia, covering an area of 1,000,000 km². As such, this is one of the largest and most continuous areas of arid woodland on the planet. Throughout the text we use the term 'chaco' to indicate this habitat, while 'Chaco' is used to indicate the province of Chaco. The chaco can be subdivided into two main habitats, humid chaco in the east and dry chaco in the west. The dry chaco is often subdivided again with 'sierran chaco' on higher ground. In general terms, chaco woodlands are characterised by four currently recognised species of quebracho (*Aspidosperma* and *Schinopsis* spp.) which represent the tallest trees, and which have undergone severe exploitation. The majority of trees are thorny and widespread throughout the life-zone, and include the Algarrobo Negro *Prosopis nigra*, Algarrobo Blanco *Prosopis alba*, Mistol *Ziziphus mistol*, Guayacán *Caesalpinia paraguariensis*, Guarananiná *Sideroxylon obtusifolium*, Chañar *Geoffroea decorticans* and Espinillo *Acacia caven*. Cacti are also dominant, especially in the dry chaco, and some take on the proportion of large trees, e.g. the Cardón *Stetsonia coryne*. Bird species diversity is high although many species range into adjacent Monte desert. Several species are exclusive, or almost exclusively restricted to the chaco in Argentina and these include Brushland Tinamou *Nothoprocta cinerascens*, Spot-backed Puffbird *Nystalus maculatus*, Red-billed Scythebill *Campylorhamphus trochilirostris*, Stripe-backed Antbird *Myrmorchilus strigilatus*, Chaco Warbling Finch *Microspingus* [*torquatus*] *pectoralis*, and Chaco Sparrow *Rhynchospiza strigiceps*. Endemic species to each of the chaco habitats are mentioned below.

The **dry chaco** of eastern Jujuy and eastern Salta across western Formosa and western Chaco, south through eastern Tucumán, much of Santiago del Estero, and eastern Catamarca and La Rioja to north-west Córdoba is the largest area of chaco and is dominated by the narrow-leaved Quebracho Colorado Santiagueño *Schinopsis lorentzii* reaching a height of 24 m, and the more widespread Quebracho Blanco *Aspidosperma quebracho-blanco*. Other characteristic trees include the Palo Santo *Bulnesia sarmientoi* with its distinctive pendulous fruits, Palo Cruz *Tabebuia nodosa*, Yuchán or Palo Borracho *Ceiba chodatii* with its distinctive spiky and swollen trunk, and the thorny Itín *Prosopis kuntzei*. The Quimil *Opuntia quimilo* and Ucle *Cereus forbesii* are two of the most dominant species of cactus. The understorey is dense and characterised by large terrestrial bromeliads of the genus *Bromelia,* collectively known as Chaguars. Two endemic bird species of this habitat are the Quebracho Crested Tinamou *Eudromia formosa* and Cinereous Tyrant *Knipolegus striaticeps*, while shrublands of Aliso de Río *Tessaria integrifolia* and *Baccharis* spp. harbour a chaco endemic breeder, Dinelli's Doradito *Pseudocolopteryx dinelliana*. The southern portion of the dry chaco holds two vast areas of salt flats known as salinas: the Salinas Grandes in north-west Córdoba and south-east Catamarca, and the Salinas de Ambargasta in south-west Santiago del Estero. Their periphery is dominated by a succulent shrub ecotone reaching 80 cm in height (*Heterostachys*, *Allenrolfea*, *Atriplex*, *Suaeda* spp. and *Prosopis reptans*) supporting the principal populations of the endemic Salinas Monjita *Neoxolmis salinarum*.

Hill ranges known as sierras in the provinces of Córdoba, San Luis, Catamarca, La Rioja and the Sierra de Guasayán in west Santiago del Estero are covered with **sierran chaco woodlands** between 700 and 1300 m, with bush cover up to 1700 m. Dominant species include the Horco-Quebracho *Schinopsis marginata*, Molle de Beber *Lithraea molleoides*, Cochucho *Zanthoxylum coco*, Maitén *Maytenus boaria* (also characteristic of the Patagonian forest) and areas of *Polylepis australis* at and above the tree-line. The shrub-zone is dominated by the Sierran Romerillo bush *Heterothalamus alienus*, other bushes such as *Eupatorium*, *Baccharis* and *Colletia* spp., abundant mistletoe-like semi-parasites (*Phoradendron*, *Tripodanthus* and *Ligaria* spp.), and some sectors are dominated by stunted Caranday Palms *Trithrinax campestris* showing a strong link with the humid chaco (see below). The avifauna is diverse and contains elements of Andean and dry chaco

species. It supports the world's most important population of Black-bodied Woodpecker *Dryocopus schulzi*, possibly the most threatened woodpecker in South America.

The **humid chaco** spans central and eastern Formosa and Chaco provinces as well as north-east Santiago del Estero and northern Santa Fe provinces, and is dominated by the Quebracho Colorado Chaqueño *Schinopsis balansae*, Urunday *Astronium balansae*, Marmelero *Ruprechtia laxiflora* and Guayaibí *Patagonula americana*, in addition to many widespread dry and sierran chaco trees (listed above), bushes such as Vinal *Prosopis ruscifolia*, Garabato Negro *Acacia praecox* and Colquiyoyo *Maytenus vitis-idaea*, and an understorey of terrestrial bromeliads (*Bromelia*, *Dyckia*, *Aechmea* spp.). Humid chaco woodlands often take on the form of **forest islands in savanna** while oxbow lakes are usually dominated by heron colonies. The entire area is interspersed by a mosaic of lakes and open water bodies known as **esteros**, lined with *Schoenoplectus californicus* sedges and *Typha* spp. cattails, floating mats of water hyacinths *Eichhornia* spp., giant flowering lily pads *Victoria cruziana*, stands of the large-leaved Pehuajó *Thalia* spp. and dense stands of the papyrus-like Pirí sedge *Cyperus giganteus*, intersected with periodically inundated *Spartina* and *Elionurus* grasslands. Extensive areas of **palm savanna** are dominated by stands of Palma Blanca *Copernicia alba* with sectors of Pindó Palm *Syagrus romanzoffiana*, Yatay *Butia yatay*, the stunted Carandillla *Trithrinax schyzophylla*, and the thorny Mboyaca Palm *Acrocomia aculeata*. Bird species diversity is far greater in the humid chaco than in the dry chaco, and contains notable elements of the Mesopotamian grasslands and Paraná forest. Bird species that are exclusively found in Argentina in the humid chaco include the Undulated Tinamou *Crypturellus undulatus* and Peach-fronted Parakeet *Eupsittula aurea*.

**Gallery forests**, a forest type that is typical of rivers and streams in many biomes, are well distributed along the Bermejo and Pilcomayo rivers from eastern Salta across northern Formosa, and along the border of Formosa and Chaco provinces. The western sectors act as a corridor of dispersal of lower Yungas flora and birds with species such as Blue-crowned Trogon *Trogon curucui* and Black-banded Woodcreeper *Dendrocolaptes picumnus* reaching gallery forests as far as extreme north-east Formosa province. Eastern gallery forests are more homogenous with those found in the Mesopotamian savannas (described below) and allow movements of birds such as Green Ibis *Mesembrinibis cayennensis* from the Paraná rainforest. They also hold a number species which are local in Argentina, being mostly restricted to eastern Formosa and Chaco such as Grey-lined Hawk *Buteo nitidus*, Bare-faced Curassow *Crax fasciolata* and Flavescent Warbler *Myiothlypis flaveola*.

## ESTEROS DEL IBERÁ AND CAMPOS

(**Habitats**: esteros, dry grasslands, Campos, palm savanna, gallery forest, Paraná Delta)

The **Esteros del Iberá** is a globally unique ecosystem which comprises a mosaic of higher-lying dry grasslands and low-lying humid climax grasslands with a vast network of subterranean water channels that feed numerous open lakes. Much of the low-lying areas comprises floating vegetation-covered water bodies known as esteros. The Esteros del Iberá system covers 20,000 km$^2$, harbours some 350 species of birds and boasts a biodiversity comparable only with the Llanos of Venezuela or the Pantanal of Brazil. Some of the most noteworthy species include Black-and-white Monjita *Heteroxolmis dominicanus*, Strange-tailed Tyrant *Alectrurus risora* (the global stronghold), Marsh Seedeater *Sporophila palustris*, Rufous-rumped Seedeater *Sporophila hypochroma*, Chestnut Seedeater *Sporophila cinnamomea*, Yellow Cardinal *Gubernatrix cristata* and Saffron-cowled Blackbird *Xanthopsar flavus*. Elevated areas in southern Misiones, northwest Corrientes and central Entre Ríos have rolling hill formations of **dry grasslands**. The principal grasses include *Paspalum notatum*, *Aristida jubata*, *Andropogon lateralis*, *Elionurus tripsacoides*, *Setaria* and *Stipa* spp., while inundated areas support giant stands of *Panicum prionitis* and *Cortaderia selloana*.

Rolling grasslands in the red soil region of north-east Corrientes and southern Misiones cover around 1.1 million hectares and are defined as **Campos**, covered principally by *Aristida pallens* and *Paspalum*

*quadrifarium* grasses, over a basaltic bedrock with islands of Urunday (*Astronium balanse* and *Acosmium subelegans*) woodland. This area was formerly characterised by the dwarf palm Yatay Poní *Allagoptera leucocalyx,* although very few pockets now remain. The Campos support the main populations of Sickle-winged Nightjar *Eleothreptus anomalus*, Streamer-tailed Tyrant *Gubernetes yetapa*, Ochre-breasted Pipit *Anthus nattereri*, and Pearly-bellied Seedeater *Sporophila pileata,* and the ever-decreasing Saffron-cowled Blackbird *Xanthopsar flavus* and Black-masked Finch *Coryphaspiza melanotis*, as well as the only populations of Least Nighthawk *Chordeiles pusillus*. Cock-tailed Tyrant *Alectrurus tricolor* and hypothetical Collared Crescentchest *Melanopareia torquata* formerly occurred here but now appear to be extinct. Elsewhere, more characteristic **palm savanna** is represented by areas of Palma Blanca *Copernicia alba* in Corrientes, and the last remaining extensive Yatay Palm forest *Butia yatay* is protected in El Palmar National Park in central-eastern Entre Ríos. Grass communities in these savannas are dominated by *Andropogon lateralis*, *Paspalum notatum*, *Stipa* (*Nassella*) *megapotamica* and *Setaria parviflora*. Bird species diversity is very high and there are a large number of species which are threatened on a global scale. Although the entire Mesopotamian life-zone has traditionally been used for cattle-raising, much of the elevated areas are being converted to pine and *Eucalyptus* plantation causing a dangerous threat to many of the grassland species. The Mesopotamian life-zone is interspersed with large areas of Espinal woodland (see below), and bordered by **gallery forest** along the rivers Uruguay and Paraná, which also penetrates some internal river systems. This forest has strong affinities with the Paraná rainforest and acts as a corridor for the dispersal of birds and plants from that region. The forests comprise Curupí *Sapium haematospermum,* Timbó Blanco *Albizia inundata*, Seibo *Erythrina crista-galli*, Sauce Criollo *Salix humboldtiana*, Sangre de Drago *Croton urucurana,* Ubajay *Hexachlamys edulis*, Aliso del Río *Tessaria integrifolia*, Ibapoy *Ficus luschnathiana*, Anchicó Colorado *Parapiptadenia rigida*, Ingá *Inga uraguensis*, Ombú *Phytolacca dioica*, Bugre *Lonchocarpus nitidus* and stands of Picanilla Bamboo *Guadua paraguayana*.

## PARANÁ FOREST

(**Habitats**: Paraná rainforest, riverine forest, bamboo stands, *Araucaria* forest)

This subtropical evergreen rainforest, also known as Interior Atlantic Forest, was formerly connected to the Coastal Atlantic forest, or *Mata Atlantica* of coastal Brazil, and is so-named because of its exclusive distribution in the Paraná watershed. In Argentina this forest is restricted to Misiones and extreme north-east Corrientes province. Elsewhere, it extends rather patchily in eastern Paraguay and in Paraná state, Brazil with virtually all of the Paraná forest having been cleared in the adjacent Brazilian states of Santa Catarina and Rio Grande do Sul. **Paraná rainforest** is characterised by more than 200 species of trees and over 2000 species of vascular plants. The tree canopy is generally 20–30 m above the ground with emergents reaching 40 m, and there is an abundance of lianas, epiphytes and tree orchids. Some of the most representative trees include the Cedro Misionero *Cedrella fissilis*, Lapacho Rosado *Tabebuia impetiginosa*, Peteribí *Cordia trichotoma*, Laurel Negro *Nectandra megapotamica*, Guatambú Blanco *Balfourodendron riedelianum*, Timbó or Pacará *Enterolobium contortisiliquum*, Caña Fístula *Peltophorum dubium*, Incienso *Myrocarpus frondosus*, Grapia *Apuleia leiocarpa* and the Palo Rosa *Aspidosperma polyneuron*, the tallest of the emergents reaching 42 metres. The principal fruiting trees include the Pindó Palm *Syagrus romanzoffiana* reaching 20 m, Ubajay *Hexachlamys edulis*, Cerella *Eugenia involucrata*, Ñangapirí *E. uniflora*, Aguay *Chrysophyllum gonocarpum* and Cocú *Allophylus edulis*. Some 400 species of birds inhabit this ecosystem, from the forest floor through all strata to the canopy. Species such as the Brazilian Merganser *Mergus octosetaceus* were formerly restricted to river corridors within the Paraná forest, and the associated **riverine Paraná forest** supports large avifaunal communities including the threatened Black-fronted Piping Guan *Pipile yacutinga*. The dominant tree species in this habitat are Laurel Blanco *Ocotea acutifolia*, Laurel del Río *Nectandra angustifolia*, Mata Ojo *Pouteria salicifolia* and Ambaí *Cecropia pachystachya*.

The understorey of Paraná forest may be open or dense, and in addition to sectors of giant tree ferns (*Alsophila* spp. and *Dicksonia sellowiana*), **bamboo stands** represent an important vegetation community. The five common bamboo species involved are the giant spiny Tacuaruzú *Guadua chacoensis* which reaches 30 metres in height and forms dense stands; the slightly smaller, and more curved, spiny Yatevó *Guadua trinii*; the medium-sized Tacuapí *Merostachys claussenii*; the low, slender Tacuarembó *Chusquea ramosissima*, and the local Pitinga *Chusquea tenella*. The twelve bird species which can be classed as strict bamboo specialists in Argentina are Purple-winged Ground Dove *Paraclaravis geoffroyi*, White-bearded Antshrike *Biatas nigropectus*, Bertoni's Antbird *Drymophila rubricollis*, Rufous-tailed Antthrush *Chamaeza ruficauda*, Spotted Bamboowren *Psilorhamphus guttatus*, Yellow Tyrannulet *Capsiempis flaveola*, Large-headead Flatbill *Ramphotrigon megacephala*, Brown-breasted Bamboo Tyrant *Hemitriccus obsoletus*, Temminck's Seedeater *Sporophila falcirostris*, Buffy-fronted Seedeater *Sporophila frontalis*, Unicolored Finch *Haplospiza unicolor* and Blackish-blue Seedeater *Amaurospiza moesta,* of which the ground dove and the *Sporophila* seedeaters depend largely on *Guadua* bamboo seeding which occurs in cycles of up to thirty years. Other species are frequently but not exclusively found in bamboo stands, including Ochre-collared Piculet *Picumnus temminckii* and Tufted Antshrike *Mackenziaena severa* among other birds.

In north-east Misiones two hill ranges, the Sierra de Santa Victoria and the Sierra de Misiones, reach 1000 m and are flanked by relictual stands of ***Araucaria* forest** where less than 1% of the original 210,000 hectares of this forest type survives today. Here, the Paraná Pine *Araucaria angustifolia*, which is otherwise known only in the states of Rio Grande do Sul and Santa Catarina, Brazil, forms a few pure forest areas and many isolated stands, but is usually mixed with Paraná rainforest, and some trees can reach heights of 40 m. Although numerous species of birds inhabit this forest type, Araucaria Tit-Spinetail *Leptasthenura setaria* and Vinaceous-breasted Amazon *Amazona vinacea* are the only exclusive inhabitants, while Azure Jay *Cyanocorax caeruleus* and a recently discovered small population of Black-capped Piprites *Piprites pileata* also have important links with this forest type.

## ESPINAL

(**Habitats**: Espinal and Caldén woodlands)

The **Espinal** is a thorn woodland which also occupies parts of western Uruguay and the extreme south-western tip of Rio Grande do Sul State, Brazil where it is known as *Espinillo*. However, Espinal is virtually an endemic biome to Argentina and expands extensively across southern Corrientes and Entre Ríos, forming a mosaic of hot, humid woodlands over the Mesopotamian savanna, and continuing west through central Santa Fe. They reappear in southern Córdoba, south-east San Luis and cut a broad swathe through La Pampa province, reaching the coast in the extreme southern Buenos Aires province. The western and southern region is dry and xerophytic in comparison with that found in Mesopotamia. Espinal woodlands in Mesopotamia are sometimes referred to as Mesopotamian Parkland because they are reminiscent of parkland on the plains of East Africa and have an open understorey. The dominant species from east to west are the Ñandubay *Prosopis affinis*, Algarrobo Blanco *P. alba*, Algarrobo Negro *P. nigra*, Espinillo *Acacia caven*, Cina-cina *Parkinsonia aculeata*, Quebracho Blanco *Aspidosperma quebracho-blanco*, Caranday Palm *Trithrinax campestris*, Tembetarí *Zanthoxylum fagara*, Sombra del Toro *Jodina rhombifolia* with distinctive holly-shaped leaves, Coronillo *Scutia buxifolia*, Chañar *Geoffroea decorticans* and Molle *Schinus longifolius*. Several bird species are shared between the Espinal and chaco, including Lark-like Brushrunner *Coryphistera alaudina*, Short-billed Canastero *Asthenes baeri* and Little Thornbird *Phacellodomus sibilatrix*.

In the extreme south of the Espinal woodlands in south-east San Luis, La Pampa and southern Buenos Aires, **Caldén woodlands** *Prosopis caldenia* are intermixed with other typical Espinal trees and shrubs mentioned above, and with grassland communities of the genera *Trichloris*, *Stipa*, *Elionurus*, *Digitaria*, *Poa* and *Aristida*. Bird species diversity is fairly high and contains components of chaco woodlands and Monte desert. One extremely threatened Espinal species is the Yellow Cardinal *Gubernatrix cristata*.

## PAMPAS

(**Habitats**: Pampas grassland, Pampas marshes, Tala woodlands, Paraná Delta)

The Pampas region, of which La Pampa province only forms a small part, was formerly a vast plain of flat low-lying grasslands covering an area of 430,000 km² in the provinces of Buenos Aires excluding the southern 'pan handle', southern Santa Fe, southern Córdoba, adjacent parts of San Luis and extreme north-west La Pampa. Today, natural Pampas grassland has been reduced to small disjunct areas, one of the largest pristine areas being in southern Buenos Aires province to the west of Bahia Blanca. The dramatic change is the result of major agricultural advances between 1890 and 1950 which have almost transformed the entire area to agriculture and cattle-raising. Climax **Pampas grasslands** includes Cebadilla Criolla *Bromus catharticus*, Cortadera or Pampas Grass *Cortaderia selloana*, Pasto Miel *Paspalum dilatatum*, Paja Colorada *P. quadrifarium*, Pelo de Chancho *Distichlis scoparia* and *D. spicata*, flechillas *Piptochaetium montevidense* and *Stipa* (*Nassella*) *neesiana*, and espartillos *Spartina densiflora* and *Elionurus muticus*. Coastal sand dunes are covered with *Poa lanuginosa* grass and *Adesmia incana*. Specialist grassland birds such as Pampas Meadowlark *Leistes defilippi* are now almost exclusively restricted to small areas near Bahia Blanca, and the Black-and-white Monjita *Heteroxolmis dominicanus* to a small area in central-eastern Buenos Aires. The enigmatic Pampas Pipit *Anthus chacoensis* is an endemic breeder in this habitat. It is noteworthy that several other species including Strange-tailed Tyrant *Alectrurus risora* and Saffron-cowled Blackbird *Xanthopsar flavus* are now extinct in the Pampas grasslands. Numerous freshwater and brackish lakes, and a mosaic of rivers, combine to form the **Pampas marshes** which still dominate certain sectors of the Pampas landscape. These support some of the most important populations of Dot-winged Crake *Laterallus spilopterus*, Red-and-white Crake *Laterallus leucopyrrhus*, Freckle-breasted Thornbird *Phacellodomus striaticollis*, Bay-capped Wren-Spinetail *Spartonoica maluroides*, Sulphur-bearded Reedhaunter *Limnoctites sulphuriferus*, Curve-billed Reedhaunter *Limnornis curvirostris*, Hudson's Canastero *Asthenes hudsoni* and Warbling Doradito *Pseudocolopteryx flaviventris*, which also extend locally into the Mesopotamian grasslands.

Two mountain ranges, Ventania and Tandilia, in southern Buenos Aires province are dominated by *Stipa* and *Piptochaetium* grasses. The higher of these two ranges, Sierra de la Ventana, supports isolated populations of Cordilleran Canastero *Asthenes modesta*, Black-billed Shrike-Tyrant *Agriornis montana* and Greater Yellow Finch *Sicalis auriventris*.

A narrow strip of **Tala woodlands** (*Celtis ehrenbergiana*) extends along the littoral region of the Río de la Plata estuary, from the Paraná Delta south-east to Punta Rasa at the mouth of this, the world's widest river, and these woodlands support a variety of typical Espinal bird species.

In the northern sector of the Pampas, floral composition changes as one descends into the deep depression of the **Paraná Delta**, often described as a separate ecoregion or life-zone in itself. This low-lying and periodically flooded region with limited access is dominated by marsh grasses including Paja Brava *Scirpus giganteus*, Espartillo *Spartina densiflora*, Paja Mansa *Paspalum quadrifarium*, Totora *Typha latifolia* and various sedges and rushes (*Schoenoplectus*, *Juncus* spp.). Sparse tree and bush cover includes the Seibo *Erythrina crista-galli*, Acacia Mansa *Sesbania punicea*, Carpinchera *Mimosa pellita*, Espinillo Manso *M. pilulifera*, Sarandí Blanco *Phyllanthus sellowianus*, Palo Amarillo *Terminalia australis* and Aliso del Río *Tessaria integrifolia*. Among the high bird species diversity, which also includes a variety of gallery forest, Pampas and Paraná Forest species, the threatened Marsh Seedeater *Sporophila palustris* appears with some regularity, along with several poorly known species such as the Dot-winged Crake *Laterallus spilopterus* and Straight-billed Reedhaunter *Limnoctites rectirostris*.

## PATAGONIAN STEPPE

(**Habitats**: Patagonian grass-steppe, Fuegian grass-steppe, Patagonian marshes, Patagonian steppe-lakes, Patagonian brush-steppe, scree slopes, Fuegian bogs)

The Patagonian steppe is an arid desert with little rainfall and is the largest ecoregion in Argentina covering *c.*798,000 km², or approximately 70% of Patagonia which in itself is approximately the size of Colombia. Cold winds from the Pacific Ocean drop most of the rain on the Andean cordillera and otherwise cause rapid evaporation across the steppe zone. The landscape is barren and rocky, covered with grasslands and low thorn scrub, and dotted with seasonal lakes. Three types of steppe prevail. In Neuquén, a narrow strip of grasslands, juxtaposed to the Patagonian forests, extends along Andean slopes from 750 to 1400 m and expands south of 51°S over Santa Cruz province. This **Patagonian grass-steppe** is dominated by three grasses: Coirón Dulce *Festuca pallescens* on the highest slopes, and Coirón Amargo *Stipa* (*Jarava*) *speciosa* and *J. humilis* on lower slopes. Other characteristic flora includes Neneo *Mulinum spinosum*, *Acaena* spp., *Euphorbia portulacoides*, *Viola maculata*, etc. In the south, this habitat supports the poorly known near-endemic Patagonian Tinamou *Tinamotis ingoufi*. **Fuegian grass-steppe**, found on northern Isla Grande, is somewhat different, being dominated by *Festuca gracillima*, *Poa*, *Hordeum*, *Agrostis* and *Bromus* spp., where Short-billed Miner *Geositta antarctica* breeds. The Mata Negra *Chiliotrichum diffusum* shrubs dominating areas of rolling hills provide habitat for Austral Canastero *Asthenes anthoides*. The southernmost sector of Patagonian grass-steppe, together with the Fuegian grass-steppe, support the precarious continental migratory population of Ruddy-headed Goose *Chloephaga rubidiceps*, together with an endemic subspecies of White-bridled Finch *Melanodera melanodera princetoniana,* which occupies a similar range. Certain sectors from Chubut to Tierra del Fuego are also interspersed with **Patagonian marshes** dominated by *Schoenoplectus californicus* sedges. These provide habitat for numerous marshbirds, waterfowl and, mainly in Santa Cruz province, the poorly known Austral Rail *Rallus antarcticus* which was rediscovered in 1998. Sub-Andean **Patagonian steppe-lakes** are temporary fresh or brackish waterbodies which dominate western zones and spread across northern Tierra del Fuego. Often, the only vegetation is the submergent water milfoil known as Vinagrilla *Myriophyllum quitense*, and in Santa Cruz this provides the exclusive nesting material for the endemic breeding Hooded Grebe *Podiceps gallardoi*. The poorly known Magellanic Plover *Pluvianellus socialis* also breeds along these lake shores, before migrating north along the coast. Some of the larger steppe-lakes such as Laguna Blanca in Neuquén province support a huge number of waterbirds and provide wintering grounds for long-distance migratory waders.

A mix of grass-steppe and shrub cover beginning in northern Neuquén extends southward and expands across Patagonia from central Río Negro through much of Santa Cruz, but also appears on the Valdés Peninsula. This **Patagonian brush-steppe** is connected in the north to Patagonian grass-steppe and to Monte desert and occupies the driest region of Patagonia with only 100–150 mm annual rainfall. It is dominated by a variety of low bushes and dwarf trees including the rounded Quilembai bush *Chuquiraga avellanedae*, together with Colapiche *Nassauvia glomerulosa*, Molle Patagónico *Schinus johnstoni*, Malaspina *Retanilla patagonica*, Mata Negra *Junellia tridens* and Mataguanaco *Anarthrophyllum rigidum*, etc. Occasionally the landscape is interrupted by basaltic outcrops. Noteworthy birds include the endemic Patagonian Canastero *Pseudasthenes patagonica* and the near endemic Band-tailed Earthcreeper *Ochetorhynchus phoenicurus*. Above the tree-line, where Ñire *Nothofagus antarctica* becomes stunted ('krumholz'), **scree slopes** only support a sparse covering of moss and lichens and in spite of the lack of vegetation, this habitat supports two Patagonian endemics; White-bellied Seedsnipe *Attagis malouinus* and Yellow-bridled Finch *Melanodera xanthogramma*, both of which descend in winter to the lowlands and coastal regions.

In south-east Tierra del Fuego, Patagonian grass-steppe gives way to **Fuegian bogs** which are intermixed with stunted Patagonian forest. This tundra-like landscape is home to one of the world's least known waders, the Fuegian Snipe *Gallinago stricklandii*, although for unknown reasons it is chiefly found on higher ground on uninhabited islands.

## PATAGONIAN FOREST

(**Habitats**: *Araucaria* forest, Valdivian forest, Coihue forest, steppe-forest, Magellanic forest)

The Patagonian forest is a subantarctic Andean temperate evergreen and deciduous forest, in a glacial landscape with numerous lakes and rivers. Tree composition varies with latitude and altitude and is mostly dominated by 'southern beech' trees of the genus *Nothofagus*. The main forest block extends from 39°S in south-west Neuquén to Santa Cruz and reappears on Isla Grande and Isla de los Estados in Tierra del Fuego. In Chile the forest extends almost 600 km further north; however, an extensive remnant forest of Roble Pellín *Nothofagus obliqua*, of Chilean affinity, survives in north-west Neuquén in an area of arid steppe grasslands, and holds Argentina's only population of Chestnut-throated Huet-huet *Pteroptochos castaneus*. In central-west Neuquén at 37°45'S, the first areas of 45 m-high Pehuén ('monkey-puzzle') *Araucaria araucana* **forest** dominate the skyline. These extend southwards in patches to 40°S, intermixing with Lenga *Nothofagus pumilio* around 38°S. The two most widespread trees in the entire Patagonian forest are the Lenga, ranging from sea-level to 1800 m, but stunted above 1400 m, and the small-leaved Ñire *N. antarctica*, ranging from sea-level to 1550 m and occurring mostly in humid areas. These species are sometimes mixed in the northern sector with *N. obliqua* and Raulí *N. nervosa*, reaching a height of 35 metres. The term **Valdivian forest** is usually applied to Patagonian forests in Chile, but typical Valdivian forest also straddles the Andean chain from south-west Neuquén to north-west Chubut, where annual rainfall is over 3000 mm. The three dominant trees are all evergreen and include the Coihue *Nothofagus dombeyi,* mainly 25–30 m and occasionally 45 m high; the formidable Alerce *Fitzroya cupressoides* reaching 30–70 m and living up to 3,600 years; Mañiú Macho *Podocarpus nubigenus*, Mañiú Hembra *Saxegothaea conspicua*, Fuique *Lomatia ferruginea*, Huahun *Laureliopsis philippiana* and Tineo *Weinmannia trichosperma*. To the east of the Valdivian Forest, **Coihue forest** occurs from lake level to 900 metres and is dominated by Coihue *N. dombeyi*, often mixed with Ñire and Lenga, Radal *Lomatia hirsuta*, and the pyramidal-shaped Cordilleran Cypress *Austrocedrus chilensis*. Lakes are usually bordered by Arrayán *Luma apiculata* with its distinctive cinnamon-coloured bark, and Patagua *Myrceugenia exsucca*. The understorey of Valdivian and Coihue Forest, and *N. obliqua* forest in the extreme north of this life-zone, is always dominated by stands of Coligüe bamboo *Chusquea culeou* which can reach a height of 4 metres and sometimes extends outside of the tree-cover along rivers and streams. Dominant understorey bushes include Barberry *Berberis* spp., Wild Currant *Ribes* spp. and Canelo *Drymis winteri*.

The lower slopes of the northern sector of forest from south-west Neuquén to Chubut also have **steppe-forest** on the lower slopes, which constitutes an ecotone with the Patagonian Steppe. Here, dominant trees include the Cordilleran Cypress, which often forms pure forests below 1000 m on drier slopes, Radal, Laura *Schinus patagonicus*, Retama *Diostea juncea*, Espino Negro *Colletia spinosissima* and Palo Piche *Fabiana imbricata*. Maitén *Maytenus boaria* and Chacay *Discaria* spp. occupy the lowest slopes along rivers.

In western Santa Cruz and Tierra del Fuego, including Isla de los Estados and Isla Navarino (Chile), the forest changes composition again and forms **Magellanic forest**. In addition to the omnipresent Ñire and Lenga, Magellanic Forest is characterised by the 25 m-high Guindo *Nothofagus betuloides*, the 20 m-high Ten *Pilgerodendron uviferum* (mostly in *Sphagnum* bogs), and Canelo *Drymis winteri* which takes on tree form and reaches 7 m. The understorey is dominated by *Blechnum*, *Asplenium* and *Lophosoria* ferns with a huge diversity of mosses and hepatic plants.

Bird species are remarkably widespread through the ecoregion. Patagonian forests are home to some 24 endemic bird species including five endemic genera (*Enicognathus*, *Pygarrhichas*, *Eugralla*, *Colorhamphus* and *Curaeus*), and species such as Rufous-tailed Hawk *Buteo ventralis*, Rufous-legged Owl *Strix rufipes*, Magellanic Woodpecker *Campephilus magellanicus*, Thorn-tailed Rayadito *Aphrastura spinicauda*, Des Murs's Wiretail *Sylviorthorhynchus desmursii*, Patagonian Forest Earthcreeper *Upucerthia saturatior,* Fire-eyed Diucon *Pyrope pyrope* and Patagonian Sierrra Finch *Phrygilus patagonicus*. Also noteworthy are the

wide diversity of tapaculos (Rhinocryptidae), ranging from the small plain *Scytalopus* tapaculos to the giant huet-huets (*Pteroptochos* spp.), all with far-carrying vocalisations which reverberate through the forest. Endemic waterbirds include Spectacled Duck *Speculanus specularis* and an endemic subspecies of Great Grebe *Podiceps major navasi*.

## ATLANTIC SHORE AND OCEANIC WATERS

(**Habitats**: mudflats, sandy beaches, saltmarsh, cliffs, pebble beaches, kelp forest, temperate inshore and offshore ocean, subantarctic inshore and offshore ocean)

The Atlantic coastline of Argentina covers more than 4500 km, from the Río de la Plata estuary to Tierra del Fuego, and comprises two main shore types. From Punta Lara to Bahia Blanca shores comprise a mix of tidal **mudflats** and **sandy beaches** with adjacent **saltmarshes,** usually dominated by *Spartina densiflora* and sand-dunes and where marine vegetation is dominated by green algae (*Ulva, Enteromorpha* and *Chaetomorpha* spp.) and red algae (*Porphyra*, *Condria* etc). Between Bahía Blanca and Bahía Anegada, flat **sandy islands** serve as the unique, and limited, breeding grounds for Olrog's Gull *Larus atlanticus*.

From the mouth of the Río Negro south to Río Gallegos, in southern Santa Cruz, the seaboard includes vertical **cliffs**, rocky islets, noteworthy capes and gulfs, usually with **pebble beaches** which continue into northern Tierra de Fuego, until they are interrupted by the extensive tidal **mudflats** of Bahia San Sebastián. The Patagonian shoreline, and in particular the Fuegian shoreline, varies from having a wide to extreme intertidal zone. Here, the marine vegetation is characterised by beds of giant **kelp forest** *Macrocystis pyrifera* and other seaweeds (*Lessonia*, *Durvillea* spp. etc). The endemic Chubut Steamer Duck *Tachyeres leucocephalus*, described new to science in 1974, is restricted to rocky shorelines with kelp beds.

To the south-east of Río Grande in Tierra del Fuego, coasts are flanked by Magellanic forest, mixed with tundra bogs, cliffs, sandy and pebble beaches and capes with important sea-lion and shag colonies. The Mitre Peninsula supports a small breeding population of Striated Caracara *Phalcoboenus australis* and Fuegian Cinclodes *Cinclodes* [*antarcticus*] *maculirostris*.

Some outstanding sites along the Atlantic shore are Punta Rasa (wintering and staging ground for migrant shorebirds); the Valdés Peninsula (breeding colonies of Imperial Shag *Phalacrocorax atriceps* and Rock Shag *Phalacrocorax magellanicus*, Kelp Gull *Larus dominicanus*, South American Tern *Sterna hirundinacea* and Magellanic Penguin *Spheniscus magellanicus*); Punta Tombo (largest Magellanic Penguin colony); Deseado Estuary (breeding colonies of Red-legged Cormorant *Phalacrocorax gaimardi*, Rock Shag, Brown Skua *Stercorarius antarcticus* and Dolphin Gull *Leucophaeus scoresbii*); Coig Estuary (wintering grounds of Hooded Grebe *Podiceps gallardoi*); San Sebastián Bay (main wintering grounds of Hudsonian Godwit *Limosa haemastica*, Red Knot *Calidris canutus*, White-rumped Sandpiper *Calidris fuscicollis* and Sanderling *Calidris alba*); the Beagle Channel (Imperial Shag, Magellanic Oystercatcher *Haematopus leucopodus*, Fuegian Steamer Duck *Tachyeres pteneres*, Magellanic Diving Petrel *Pelecanoides magellani*, small numbers of breeding Gentoo Penguin *Pygoscelis papua*); and Isla de los Estados (breeding colonies of Rockhopper Penguin *Eudyptes chrysocome*, Southern Giant Petrel *Macronectes giganteus* and Blackish Oystercatcher *Haematopus ater*, with recent proven breeding of King Penguin *Aptenodytes patagonicus*).

Three main feeding areas are known for seabirds in waters adjacent to the continent. The first lies a short distance off Mar del Plata (central-east Buenos Aires) where the surface water has a temperature range of 18–20°C being strongly influenced by the warm Brazilian Current, but underlain by cold subantarctic water of the Falkland Current with a temperature range of 4–14°C. The relatively high phosphate levels and high salinity compared to offshore waters enhance biological productivity. This area forms an important feeding zone for several warm water species such as Yellow-nosed Albatross *Thalassarche chlororhynchos* and Cory's Shearwater *Calonectris diomedea* among others, but holds its highest diversity of pelagic species in mid-winter with the regular movement of many subantarctic and Antarctic breeders into these temperate

waters. To the south, another biologically rich area lies 200 km east of the Valdés Peninsula, Chubut and extends southwards to the Falklands with a sea temperature of 14°C and high levels of phosphate, nitrate and chlorophyll. This is the main feeding area for many seabirds which breed on the Falklands. In contrast, many breeding species from South Georgia tend to move to waters off South Africa. The third important area lies off the east coast of Tierra del Fuego where the coastal upwelling provides nutrient-rich waters. The other areas are rich in seabirds year-round, with notable absences during the breeding season which varies greatly between species.

## HEATH AND TUSSOCK (SOUTH-WEST ATLANTIC ISLANDS)

(Habitats: subantarctic heath, tussock grass, kelp forest)

A variety of islands in the south of the region exhibit a floral composition distinct from the Patagonian steppe and Patagonian forest life-zones. This is perhaps most notable on the Falkland Islands, outer islands in the Isla de los Estados group, in the Hornean island complex and at the Diego Ramírez islands.

The Falkland Islands comprise two large islands and some 700 comparatively small islands, some of which are inhabited. The main islands show sinuated and gently sloping coasts in the north-west and steep cliffs in the south-east. The landscape is treeless and is mainly dominated by subantarctic heath comprising grasses, principally White Grass *Cortaderia pilosa*, and Fachine *Chiliotrichum diffusum* as well as brush-steppe of which the main component is Diddle-dee *Empetrum rubrum*, Mountain Berry *Gaultheria pumila* and 'Christmas Bush' *Baccharis magellanica*, with certain areas dominated by Balsam Bog *Bolax gummifera* and *Valeriana sedifolia*, more humid areas by *Blechnum* fern species, while on higher ground cushion plants such as *Azorella monantha* are notable. The Tussacbird *Cinclodes antarcticus* is a widespread endemic of the heath and shoreline, mostly on rat-free islands. By far the most outstanding microhabitat of the islands, and one upon which numerous species of birds are dependent, is represented by the giant stands of tussock grass *Poa flabellata* which reach a height of 3 metres and dominate some coastal regions, especially in the east and south. Grazing and burning of this grass has resulted in the destruction of 80% of this habitat, although new plantation programmes are in progress. This habitat forms an important refuge for the entire world population of the distinctive Cobb's Wren *Troglodytes cobbi,* as well as for Grass Wren *Cistothorus platensis falklandicus*. It also provides the breeding substrate for Grey-backed Storm Petrel *Garrodia nereis* and shelter for a variety of pinnipeds. The Falkland Steamer Duck *Tachyeres brachypterus* is another endemic species, thriving in all coastal regions. This and other marine waterfowl and several pinnipeds are dependent or semi-dependent upon kelp forest comprising the *Macrocrystis* and *Lessonia* Giant Kelp species. Of the remarkable number of endemic bird taxa, some twelve other endemic subspecies found in the archipelago are mostly representatives of Patagonian steppe and Patagonian forest birds. Up to 27,000 pairs of Ruddy-headed Goose *Chloephaga rubidiceps*, are resident on the Falklands, in comparison with the small migratory mainland population. Among the breeding seabirds, the Falklands support around 75% of the world's breeding population of Black-browed Albatross *Thalassarche melanophris* including the world's largest single colony of 157,000 pairs on Steeple Jason, in addition to breeding colonies of Southern Giant Petrel *Macronectes giganteus*, Slender-billed Prion *Pachyptila belcheri*, Fairy Prion *P. turtur*, White-chinned Petrel *Procellaria aequinoctialis*, Great Shearwater *Ardenna gravis*, Sooty Shearwater *A. grisea*, Wilson's Storm Petrel *Oceanites oceanicus*, Grey-backed Storm Petrel *Garrodia nereis*, Common Diving Petrel *Pelecanoides urinatrix*, Rock Shag *Phalacrocorax magellanicus* and Imperial Shag *P. atriceps*. Five species of penguin also breed regularly which, in order of abundance, are Rockhopper *Eudyptes chrysocome*, Magellanic *Spheniscus magellanicus*, Gentoo *Pygoscelis papua*, King *Aptenodytes patagonicus* and Macaroni Penguins *Eudyptes chrysolophus*.

The Islas de los Estados (Staten Island) are separated by the 24 km-wide Le Maire Straits from the Península Mitre of Isla Grande, the largest Fuegian island. These islands extend 65 km from west to east

and are indented by broad bays and deep, narrow fiords. The islands are covered with numerous glacial lakes, and Magellanic forest (described above). Subantarctic heath covers a large proportion of the islands with peat turf and coastal grasslands; it is also found on higher ground. Tussock grass (*Poa flabellata*) also covers certain coastal regions on the main island, but is abundant on the treeless off-islands in the north of the archipelago: Alferéz Goffre, Zeballos, Elizalde and Observatorio. Giant kelp forest *Macrocystis pyrifera* characterises the inshore. In many ways the flora is rather intermediate between that found on Isla Grande and the Falkland Islands, comprising luxuriant Magellanic forest but also subantarctic heath and tussock grass. The islands have a typical Fuegian avifauna, but due to the presence of tussock grass and pinniped hauling grounds they also support Striated Caracara and Fuegian Cinclodes *Cinclodes* [*antarcticus*] *maculirostris*. Rockhopper and Magellanic Penguins breed and one pair of King Penguins was found breeding in 2004, although the species was formerly abundant on the islands. Breeding seabirds include Southern Giant Petrel, Rock Shag and Imperial Shag while a number of other species presumably breed but there has been little investigation.

Similar subantartic heath and tussock grass is also found on the Hornean Islands complex south of Isla Navarino, and Snipe Island in the western Beagle Chanel also has some tussock grass. Fuegian Cinclodes and Striated Caracara have been found in all of these places where tussock grass is located close to pinniped or shag colonies. The Diego Ramírez islands lying 100 km south-west of Cape Horn in the Drake Passage are covered in *Poa flabellata* tussock grass, where surprisingly the Thorn-tailed Rayadito *Aphrastura spinicauda* is the commonest species. This small island group is the only breeding site for Grey-headed Albatross *Thalassarche chrysostoma* in South America.

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## TAXONOMY AND NOMENCLATURE

Taxonomy is in constant flux. Keeping up with scientific changes is challenging but necessary, as these changes place birders and biologists in the frontier of knowledge on the phylogenetic relationships and species limits in birds. With the wealth of new studies and new information, the taxonomy presented here, albeit refined in present-day terms, can only reflect what is currently known and is by no means the last word on the subject. The nomenclature and species level taxonomy adopted here mainly follow those of the South American Classification Committee (SACC) (Remsen *et al*. 2020). Specific and subspecific taxonomy has recently become a hotbed of debate and, as elsewhere in the world, there is some controversy over the validity of certain species found in the region. Changes involve the elevation of subspecies to species status (colloquially known as 'splitting'), relegation of species to subspecific rank ('lumping'), invalidation of subspecies, or re-allocation of species to different genera. Subspecific taxonomy is a complex area by virtue of the numbers of taxa involved, conceptual matters and the general lack of representative specimen series. In numerous cases, subspecies were described from very few specimens which were originally only compared to a very small series of conspecifics or rarely also with congeners. In cases in which enough information was available to us to be certain of a future species-level split, we have signalled this in the text by putting the current specific epithet in square parentheses. For example, the distinctive northern (*maculatus*) and southern (*solitarius*) subspecies of Streaked Flycatcher *Myiodynastes maculatus* are firm candidates for a split. In this case, the bird inhabiting Argentina is given as *Myiodynastes* [*maculatus*] *solitarius*. This means that a very likely future taxonomic change would result in the bird in our study area being known by the name *Myiodynastes solitarius*. In many instances, we or others are actively working on taxonomic papers that should soon be published. In this way, we have avoided creating further 'field-guide taxonomy', while providing readers with critical indications of the most likely future changes. Detailed comments on the basis for these and other taxonomic decisions appear in Volume 2 (but see brief Taxonomic notes in Appendix 6).

## MIGRATION AND MOVEMENTS

The number of migration patterns and types of movements in the Argentine avifauna is overwhelmingly complex. Migration is a very important factor as the country is host to numerous species which depart north after breeding, others which displace north after breeding but stay within the country, long distance non-breeding boreal migrants from the Northern Hemisphere, and yet others which even wander southwards or northwards in the austral winter. These are the basic migratory patterns, but it is commonplace to find that within a single species there may be populations or subspecies which are resident, altitudinal migrants and partial austral migrants within Argentina (e.g., Patagonian Tyrant *Colorhamphus parvirostris*), and yet others with breeding populations and non-breeding boreal populations (e.g., Barn Swallow *Hirundo rustica*). In order to begin to understand migratory patterns in Argentina it is imperative that one is aware that the seasons are the reverse of those in the Northern Hemisphere. Therefore, any mention of 'summer' in the text refers to the austral (or southern) summer which, including spring, roughly spans the period from September to March, and corresponds to autumn and winter in the Northern Hemisphere. Note that many raptors, waders and several shearwaters, flycatchers, ducks, nighthawks and passerines that are often described as 'wintering' in Argentina, actually occur during the austral spring and summer and not therefore during the austral (or southern) winter that roughly spans April to August. The small number of birds which fail to make the return migration to boreal breeding grounds are here termed as 'over-summering'.

**Resident species** are sedentary and remain throughout the year in their home ranges, showing only insignificant movements at best. Some 680 species are here considered to be resident in Argentina and the south-west Atlantic. Virtually all of the resident species are landbirds and some coastal breeders, while the vast majority of tubenose seabirds found in Argentina are non-breeders with wide-ranging migratory patterns. A further six species appear to be extinct in Argentina: Brazilian Merganser *Mergus octosetaceus*, Eskimo Curlew *Numenius borealis* (a boreal migrant), Glaucous Macaw *Anodorhynchus glaucus*, Red-and-green Macaw *Ara chloropterus* (possibly extralimital in Argentina), Blue-winged Macaw *Primolius maracana* and Cock-tailed Tyrant *Alectrurus tricolor*. The current status of Black-masked Finch *Coryphaspiza melanotis* and Black-collared Swallow *Pygochelidon melanoleuca* requires elucidation, as both appear to have declined precipitously and lack documented records in the last 15–20 years.

**Austral migrants** behave in the reverse manner of boreal migrants in that they breed in the region covered by the book during the austral spring and summer, and then migrate northwards. Broadly defined, austral migrants do not migrate to the Northern Hemisphere, and instead 'winter' in warmer climates in northern South or even Central America, while many 'winter' a relatively short distance to the north of Argentina, in Bolivia, Paraguay and Brazil. Almost 25% of the species recorded in Argentina are austral migrants, making them a very important component of the avifauna. Austral migrants fall into three broad categories. **Austral migrants** *sensu stricto* are species that breed in Argentina and then leave the country. **Partial austral migrants** migrate northwards after breeding (i.e. chiefly in March–April), although their migratory distance is much shorter and they 'winter' wholly or partially within Argentina, at more northerly latitudes than their breeding range. Given the length of Argentina, some Patagonian partial austral migrants actually achieve rather long migrations. In spring (September–November) these species migrate back to more southerly latitudes in order to breed. Not all populations of partial austral migrants are migratory, and some populations are resident in certain parts of the country. In many cases different subspecies of the same species can be resident or migratory, adding to the complexity of migration patterns in the region.

It must be noted that the term 'partial migration' has also been used with a different meaning, referring to the differential migration of individuals of a single population, in which some individuals may migrate while others may stay. Some migratory species are **nomadic austral migrants** that exhibit complex and unpredictable seasonal patterns of migration. For example, the migration dates and seasonal occurrence of Carbonated Sierra Finch and Cinnamon Warbling Finch (both endemic breeders in Argentina) are very erratic, depending on patterns of rainfall and food abundance. However, their usual seasonal migration has some degree of nomadism, meaning that they could be abundant in one year at a certain locality, but absent the next year during the same dates.

Bamboo-seed specialists are **nomadic** and track specific food resources over large areas. These species may be present for several consecutive years in an area or region, without performing any seasonal movement, and then vacate the area for many years when the resources needed for their subsistence are not available. **Altitudinal migrants** include montane species that experience partial or complete minor-scale altitudinal movements, typically descending during the winter. Note that some species that are not regular altitudinal migrants may still displace to lower altitudes when facing extreme conditions (e.g. Scribble-tailed Canasteros *Asthenes maculicauda* may descend when their high-Andean habitats are snow-covered). Finally, a group of species appears to visit the Paraná forest of Argentina during the winter, moving westwards and descending in altitude after breeding in the Atlantic forests of southern Brazil. This system is known as the **Southern Atlantic Forest longitudinal migratory system** and includes species such as Golden-rumped Chlorophonia *Chlorophonia cyanocephala aureata*, Shear-tailed Grey Tyrant *Muscipipra vetula*, Swallow-tailed Cotinga *Phibalura flavirostris* and Black Jacobin *Florisuga fusca*. The bewildering complexity of South American migratory patterns is awaiting a continent-wide analysis to be properly described. Until then, the terminology used to describe migration patterns will only remain partially accurate, and is likely to experience a major overhaul in the next decade.

# OVERVIEW OF THE ARGENTINE AND SOUTH-WEST ATLANTIC AVIFAUNA

Here, we treat some 1,085 naturally occurring species and an additional nine introduced species (up to July 2020) reported from Argentina and the south-west Atlantic region. An amazing 88% of species recorded in Argentina are believed to breed in the region. Among these breeders 72% are sedentary and 28% are austral migrants (see Migration and movements). Only 6% are non-breeding boreal migrants. A deeper analysis on the composition of the avifauna of Argentina and the south-west Atlantic will be found in Volume 2.

## ENDEMIC SPECIES

Endemism is fairly high in Argentina and the south-west Atlantic: 25 species breed only in continental Argentina and three species are restricted to the Falkland Islands, while the ranges of an additional 17 species are primarily within continental Argentina. **Species endemic to continental Argentina (13)** and **endemic to the Falklands (3)** are breeding year-round residents restricted to these areas. **Endemic breeding species in continental Argentina (12)** breed exclusively in continental Argentina but regularly or occasionally reach other countries during the austral winter. **Near-endemic species in continental Argentina (17)** have approximately 90% or more of their ranges within the country.

| Common English name | Scientific name | Other countries of occurrence |
|---|---|---|
| **Endemic to continental Argentina (13)** | | |
| Chubut Steamer Duck | *Tachyeres leucocephalus* | |
| Moreno's Ground Dove | *Metriopelia morenoi* | |
| Sandy Gallito | *Teledromas fuscus* | |
| White-browed Tapaculo | *Scytalopus superciliaris* | |
| Córdoba Cinclodes | *Cinclodes comechingonus* | |
| White-throated Cacholote | *Pseudoseisura gutturalis* | |
| Steinbach's Canastero | *Pseudasthenes steinbachi* | |
| Patagonian Canastero | *Pseudasthenes patagonica* | |
| Salinas Monjita | *Neoxolmis salinarum* | |
| Yellow-striped Brushfinch | *Atlapetes citrinellus* | |
| Carbonated Sierra Finch | *Rhopospina carbonaria* | |
| Monte Yellow Finch | *Sicalis mendozae* | |
| Sierran Meadowlark | *Leistes [loyca] obscura* | |
| **Endemic breeding species to continental Argentina (12)** | | |
| Hooded Grebe | *Podiceps gallardoi* | Chile [o] |
| Olrog's Gull | *Larus atlanticus* | Uruguay [r], Brazil [o] |
| Straneck's Tyrannulet | *Serpophaga griseicapilla* | Brazil [o], Paraguay [r], Uruguay [r] |
| Dinelli's Doradito | *Pseudocolopteryx dinellianus* | Paraguay [o] |

| | | |
|---|---|---|
| Lesser Shrike-Tyrant | *Agriornis murina* | Bolivia [r], Paraguay [r], Uruguay [r] |
| Rusty-backed Monjita | *Neoxolmis rubetra* | Brazil [o], Uruguay [o] |
| Black-crowned Monjita | *Neoxolmis coronata* | Bolivia [r], Paraguay [r], Uruguay [r], Brazil [o] |
| Hudson's Black Tyrant | *Knipolegus hudsoni* | Bolivia [r], Brazil [o], Peru [o] |
| White-banded Mockingbird | *Mimus triurus* | Chile [o], Bolivia [r], Peru [o] |
| Pampas Pipit | *Anthus chacoensis* | Paraguay [o] |
| Chaco Sparrow | *Rhynchospiza strigiceps* | Bolivia [r], Paraguay [r] |
| Cinnamon Warbling Finch | *Poospiza ornata* | Uruguay [r] |
| **Near-endemic species in continental Argentina (17)** | | |
| Elegant Crested Tinamou | *Eudromia elegans* | Chile |
| Patagonian Tinamou | *Tinamotis ingoufi* | Chile |
| Austral Rail | *Rallus antarcticus* | Chile |
| Dot-winged Crake | *Laterallus spilopterus* | Chile, Uruguay, Brazil |
| Burrowing Parrot | *Cyanoliseus patagonus* | Chile, Uruguay |
| Creamy-rumped Miner | *Geositta isabellina* | Chile |
| Band-tailed Earthcreeper | *Ochetorynchus phoenicurus* | Chile |
| Tufted Tit-Spinetail | *Leptasthenura platensis* | Paraguay, Uruguay, Brazil |
| Bay-capped Wren-Spinetail | *Spartonoica maluroides* | Uruguay, Brazil |
| Chocolate-vented Tyrant | *Neoxolmis rufiventris* | Chile, Uruguay, Brazil |
| Patagonian Mockingbird | *Mimus patagonicus* | Chile |
| Rufous-throated Dipper | *Cinclus schulzi* | Bolivia |
| Yungas Sparrow | *Rhynchospiza dabbenei* | Bolivia |
| Yellow Cardinal | *Gubernatrix cristata* | Uruguay, Brazil |
| Tucumán Mountain Finch | *Poospiza baeri* | Bolivia |
| Patagonian Yellow Finch | *Sicalis lebruni* | Chile |
| Pampas Meadowlark | *Leistes defilippii* | Uruguay, Brazil |
| **Species endemic to the Falklands (3)** | | |
| Falkland Steamer Duck | *Tachyeres brachypterus* | |
| Tussacbird | *Cinclodes antarcticus* | |
| Cobb's Wren | *Troglodytes cobbi* | |

o = occasional in winter
r = regular in winter

# HOW TO USE THE PLATES AND FACING TEXTS

The plates were designed to include as many different plumages as possible, including sexually dimorphic plumages, subspecies, commonly seen juvenile, immature, subadult or polymorphic plumages which differ significantly to the extent that they either create specific interest or could cause confusion with other species. Birds are mostly illustrated to scale with one another, apart from the obvious decreased size of flying or more distant birds. When this was not possible, a change in scale within a plate is indicated by a line across the plate.

Each illustration is labelled on the plate and described in the facing text. Readers are urged not to make hasty identifications using the plates alone, but to refer to the text to confirm the identification. Note that there is nearly always some vital piece of information in the brief identification texts which makes for crucial reading. For polytypic species (i.e. species which have two or more subspecies), the trinomial scientific name on the plate identifies which subspecies is illustrated, even if only one subspecies occurs in our study area.

Birds are illustrated perched and in flight when it was deemed useful for field identification, e.g. ducks, geese, herons, storks, vultures, raptors, waders, gulls and terns, pigeons and doves, nightjars, large woodpeckers, a number of tyrant-flycatchers, swallows etc., while those families which are more likely to be seen only in flight, e.g. tubenoses, storm petrels, skuas and swifts etc. are only illustrated in flight.

Raptors are divided into open country species followed by forest species, and the species texts for raptors are divided into descriptions of perched birds followed by descriptions of flying birds.

## What is illustrated

Our aim has always been to try to illustrate all the breeding species in the study area (see Area covered by the book) and all those which regularly occur as non-breeding visitors, as well as scarce and vagrant visitors. In total 1,070 species have been illustrated on the colour plates. The number of vagrants, splits and even invading species has been steadily increasing during the past two decades and the compilation of this book, but all have been illustrated apart from a very few recent and extreme vagrants.

In recent years we have been designated as the list-keepers for Argentina by the South American Classification Committee of the American Ornithological Society. The committee has a strict code for inclusion of species onto country lists and only accepts those with tangible archived evidence. In this book, however, we were aware of many additional unpublished species records. Within reason, these species are incorporated and illustrated here, but are termed as 'unproven' in Volume 2. There are also many historical records from the region which cannot now be proven; some seem possible while others very unlikely. We have illustrated some of these, choosing those which are most likely and which we define as being 'hypothetical' in Volume 2. A few confusion species which occur close to the borders of the region but which have not been certainly recorded in Argentina are also illustrated. Thus, female Frilled Coquette *Lophornis magnifica*, which is an obvious confusion species with female Festive Coquette *Lophornis chalybeus*, is illustrated.

A large variety of native flora is painted to scale with the birds, and is named at species or generic level in Appendix 5, with a key to their relative importance. This will allow users to recognise specific floral requirements of certain birds.

## What is not illustrated

Four **cryptic species** which were all split in recent years, and which are virtually identical in plumage to other species, are not illustrated but are referred to under their look-alike sister species. These are Bolivian Woodpecker *Dryobates* [*lignarius*] *puncticeps*, Zimmer's Tapaculo *Scytalopus zimmeri*, Ticking Doradito *Pseudocolopteryx citreola* and Puna Pipit *Anthus* [*furcatus*] *brevirostris*. It was felt that in these cases illustrations would add nothing. However, we highlight the importance of biogeographical and vocal differences in these species (see sonograms in Appendix 4).

A few **extreme rare vagrants** (usually only a single occurrence in the region) are also not illustrated but are mentioned in the texts facing the plates, and are indexed. These are Northern Shoveler S*patula clypeata*, Amsterdam Albatross *Diomedea amsterdamensis*, Yellow-crowned Night Heron *Nyctanassa violacea*, Curlew Sandpiper *Calidris ferruginea*, Peruvian Booby *Sula variegata*, Belcher's Gull *Larus belcheri*, Lesser Black-backed Gull *Larus fuscus*, White-winged Tern *Chlidonias leucopterus*, Silver-beaked Tanager *Ramphocelus carbo*, Scarlet Tanager *Piranga olivacea* and Black-backed Tanager *Stilpnia peruviana*. Four other vagrants are illustrated only with line drawings in the text: Peruvian Pelican *Pelecanus thagus*, Sooty Tern *Onychoprion fuscatus*, Bridled Tern *Onychoprion anaethetus* and Black Noddy *Anous minutus*. We have steered a wide berth of several purported pseudo-published inclusions which lack any kind of field description, and have excluded a few others which had bizarre published descriptions and had been previously rejected from peer-reviewed journals.

We have not illustrated most of the nine **introduced species** which have viable populations, but these are described at the end of the plates in Appendix 1.

Finally, we have decided to remove Black Rail *Laterallus jamaicensis* from the Argentine list since we consider that all putative records of this species belong instead to Dot-winged Crake *Laterallus spilopterus*. Also, although piculets are currently in a state of taxonomic turmoil, we found that the traditional inclusion of Ocellated Piculet *Picumnus dorbignyanus* for Argentina appears to relate to White-wedged Piculet *P. albosquamatus*, based on plumage and altitude data from specimen evidence, and Ocellated Piculet is not included in the book.

## Plate sequence

The sequence of plates loosely follows the taxonomic sequence of the family and species accounts of Volume 2 (which is based on the SACC taxonomic sequence), as far as this was possible, but mostly follows a more traditional family sequence in order to be more user-friendly in the field. In other cases, the sequence was compromised to allow the direct comparison of confusion species or to compare similar but not closely related species on the same plate.

## Texts facing the plates

Some plate texts provide introductory summary notes of each genus or species group, detailing characters common to each species in the group. Individual species accounts include details of many subspecies, age-related plumages and colour morphs. These texts give a mean average total length and sometimes wingspan (see Measurements below). Species accounts begin with a few words on the principal range or habitat, followed by the following subheadings: **ID** (Identification) A brief summary of salient identification features for each plumage illustrated (and a few that are not illustrated). Confusion species are cross-referenced. **Voice** Descriptions and transcriptions of the most frequent vocalisations include comparisons to confusion species. **Tax note** Brief taxonomic notes on recent or likely future taxonomic changes have been included for selected cases (see Appendix 6). Emphasis is placed on taxa that occur on a regular basis, or that have a certain importance in our study area, rather than well-known taxonomic problems of wide-ranging species such as *Diomedea* and *Thalassarche* albatrosses. More extensive and detailed notes on taxonomy, including long-standing taxonomic problems, phylogenetic relationships and generic treatment of the avifauna are fully covered in Volume 2. A numbered taxonomic note (e.g., **Tax note 1**) at the end of a species account refers to the relevant entry in Appendix 6. **Alt** Some alternative names are given where relevant.

Argentine **Spanish names** are provided in square brackets at the end of each species entry.

## English vernacular names

The English vernacular names of Neotropical birds have been subject to moderate debate. We have opted to maintain as many traditional names as possible, accepting some logical changes or the revalidation of a few older names; the names largely follow those used by the International Ornithological Committee

(www.worldbirdnames.org/ioc-lists/) barring a few minor exceptions. Importantly, spelling and the usage of hyphens follows the IOC recommendations with all hyphenated compound names restricted to bird group names, thus massively reducing the usage of hyphens in compound names. Some alternative English names are listed at the end of a species account, but all the alternatives are mentioned in Volume 2 in the species footnotes. We have also chosen to use accents in English names when they relate to an Argentine place name that has an accent, not only because it is the correct and only legitimate spelling but because anyone with a minimum understanding of Spanish would be able to pronounce these names correctly rather than having to guess how to pronounce them. Several tentative novel names are included when none was available due to probable future splits (see Taxonomy), and these are just suggestions for interim usage.

## Scientific names

The Scientific names of species are always written in italics, and are given as binomials next to the English vernacular name. For polytypic species, the subspecies illustrated is labelled on the plate. Illustrations depict representative subspecies, but when two or more distinctive subspecies are illustrated, their names are always indicated. Full descriptive, distributional and taxonomic texts are provided in Volume 2 for every subspecies.

## Measurements

An average **total length** measurement, from the tip of the bill to the tip of the tail, is given in centimetres for each species, and for some sexes and some subspecies where these differ appreciably. When available measurements were not accurate, we indicate this by a *circa* abbreviation. The **wingspan** measurement is indicated by the abbreviation **WS**, but is only given when deemed useful, principally for seabirds and diurnal raptors. In general terms, total length and, in certain families, wingspan can give a good impression of a bird's overall size.

## Altitude ranges

Given the complex topography of Argentina, **altitudinal ranges** are key to understanding bird distribution in the country. Some species range only between or above certain altitudes in the Andes and Central Sierras. Upper and lower altitudinal limits are given in metres (abbreviated to m) for species which occur above 600 m above sea level. Therefore, the term 'lowlands' implies a range below and up to 600 m. Only the upper altitudinal limit is mentioned for species which range in both the lowlands and the Andes or Central Sierras. All the ranges given apply only to species' ranges within Argentina and not to altitudinal ranges in other countries which are often different and usually higher (many species of north-west Argentina tend to occur at lower altitudes than they do in Bolivia or Peru). These data were taken from the authors' own data and other observers' records, and are supplemented by museum data, and published and reliable unpublished sight records from a known locality. Lower limits are also given for altitudinal migrants which descend in winter using the same methodology.

## Sonograms

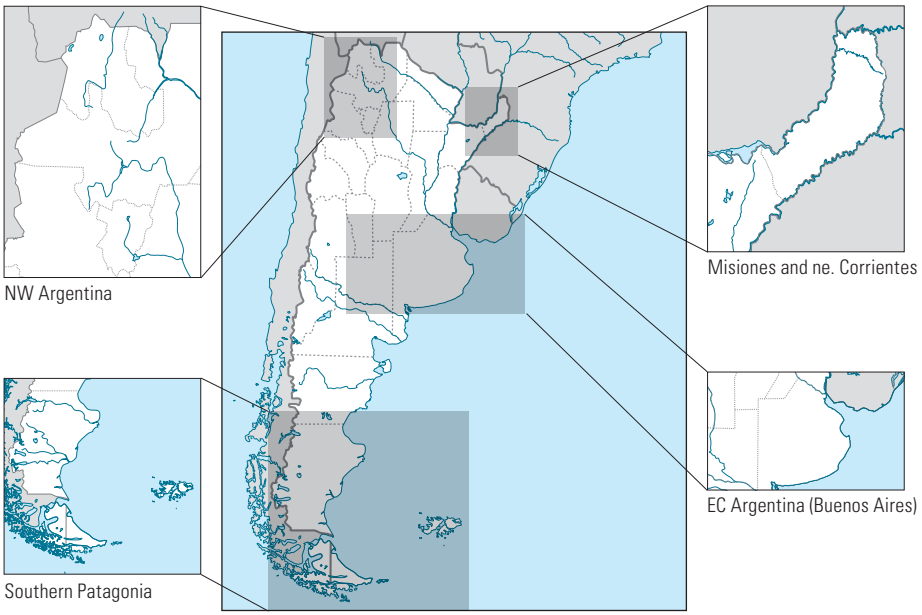
Sonograms are graphic representations of sound in which frequency (pitch) is represented on the vertical axis, time on the horizontal axis and 'loudness' (amplitude) is represented by the intensity (darkness) of the graph. A loud, high-pitched, pure whistle will appear as a dark line and occupy the upper region of the graph, while a soft harsh sound will be paler, and occupy a wider area in the lower region of the sonogram. Visualising sounds helps one learn to listen to them, and the experience of listening and studying sonograms can increase awareness of how birds sound and their identification. We have provided sonograms of 23 species that represent particularly complex identification challenges (Appendix 4). Examples include several similar tyrannulets, all pipits, and cryptic species which cannot be otherwise safely identified in the field except by vocalisations (Zimmer's Tapaculo, Ticking Doradito and Puna Pipit, none of which are illustrated). Sonograms have been grouped to include the most likely confusion species to simplify comparisons. Descriptions and details on what to look for and listen to can be found in the corresponding texts facing the plates.

## Distribution maps

Information used for the distribution maps came from multiple sources, including museum specimens, sound recordings, publications, a selection of trustworthy records from citizen science initiatives, and our own unpublished and third-party records. Depicting seasonal and dynamic patterns in a printed map is challenging. Nonetheless, we have tried to convey as much information as possible in the maps to help understand movements and the chances of seeing a bird at a certain time and place. The maps are working hypotheses that need to be tested in the field and refined with information that is currently missing. Identification of birds based solely on distribution should be avoided.

The colours and symbols indicate to the best of our knowledge what the majority of birds in a given area are expected to do, but the nature of bird movements is diverse and difficult to categorise. Individuals of some migratory breeders (e.g., hummingbirds and tyrant-flycatchers; mapped in red) frequently overwinter, yet the seasonal change in abundance is so drastic that it is clear that most members of a population regularly leave their breeding grounds every year. Some partial migrants experience good years (in which many birds stay) and bad years (in which many birds leave); depending on the general overall trends that we were able to detect, some such species have been mapped in green and others in red. Also, in many partial austral migrants, birds can depart from their breeding range only to be replaced by individuals of the same species coming from other breeding areas, creating an effect of residency (sometimes shown in the maps as green areas separating red and blue ones). In some cases, partial migration can be easily recognised in the maps because birds appear only in winter in some areas while they are mapped as resident elsewhere (green and blue maps). Altitudinal migration is seldom complete, and is typically represented by green on the montane breeding grounds and blue in adjacent low-lying areas.

Ten basic templates were designed, based on general distribution patterns to allow detailed mapping as far as possible. The bulk of the maps belong to these templates, although occasional departures from this plan occur to show specific records.




Map template used for the distribution maps, either whole for wide-ranging species or cropped into smaller discrete regions (e.g. Misiones and ne. Corrientes or NW Argentina) to show ranges at a greater scale.

## Key to map colours and symbols

**Year-round resident**. Birds that breed and stay year-round in the same area.

**Spring–summer resident**. Birds that breed and then wholly or mostly vacate the breeding grounds. Note that a small proportion may overwinter.

Seabirds close to their breeding range during spring–summer.

**Winter visitor**.

Scarce winter visitor (seabirds only).

**Seasonal non-breeding visitor**. Used mainly for spring–summer boreal migrant landbirds, and for seabirds breeding elsewhere and visiting the South-west Atlantic mostly during spring–summer.

Scarce seasonal non-breeding visitor (seabirds only).

**Passage migrant**. Birds that are found only while on passage. Also used for **nomadic breeders** which may be present/absent for many years without any seasonal pattern (mostly bamboo seed-eating birds). It is also used for Saffron-cowled Blackbird whose colonies are seldom in the same places, thereby suggesting some degree of inter-seasonal movements.

**Year-round non-breeding range at sea or along coasts**.

**Sparse occurrence**. Frequently used for vagrants that have occurred repeatedly and which are likely to occur again. Also used for some birds that are in expansion and, in a few cases, for areas for which information did not allow us to decide whether a bird breeds, overwinters or is merely on passage. Overall, pink indicates situations of low-density, low chances of seeing the bird and uncertainty on status.

Bold lines indicate the former area occupied by birds that have experienced drastic range retractions (e.g., Yellow Cardinal), or that are currently considered extinct in the study area (e.g., Glaucous Macaw).

Accidental, unique or extremely sparse records.

Confirmed specimen record when other evidence is lacking, or a species has a restricted range or is rare in the study area.

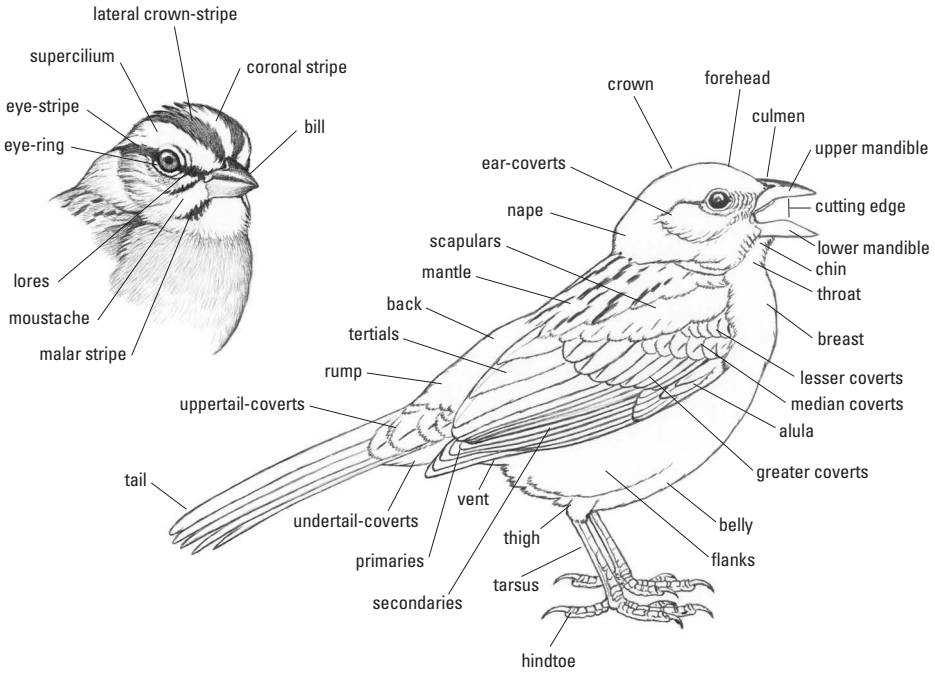
Uncertain or inconclusive records.

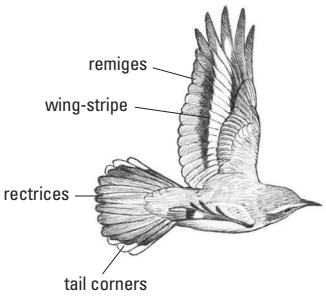
Small arrows are used to point to small distribution areas and seabird breeding colonies. Longer or double-ended arrows indicate migration routes.

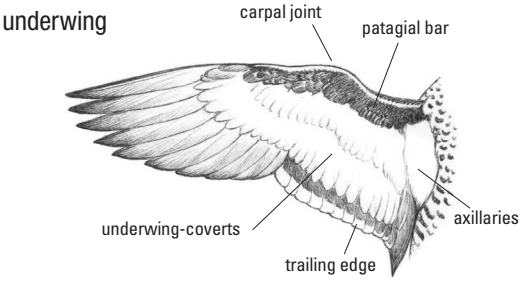
## Abbreviations and conventions

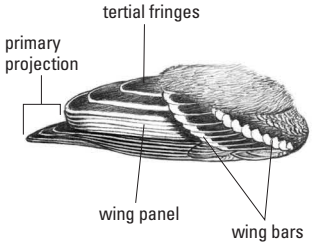
♂/♂♂: male/males
♀/♀♀: female/females
**ad**: adult
**imm**: immature
**juv**: juvenile
**br**: breeding
**non-br**: non-breeding
**1st-yr**: first-year etc
**sp**: species, used to denote an unidentified species, e.g. *Spinus* sp.
**spp**: species (plural)
**ssp**: subspecies (singular and plural)
**WS**: wingspan
*c.*: *circa*
**n., s., e., w.**: compass directions used for provinces
**N, S, E, W, C**: compass directions used for general regions of Argentina (C = Central)
**Chaco**: relates to the province of Chaco.
**chaco**: relates to the chaco ecoregion.
**C Sierras**: refers to the sierras of Cordoba and San Luis in central Argentina.

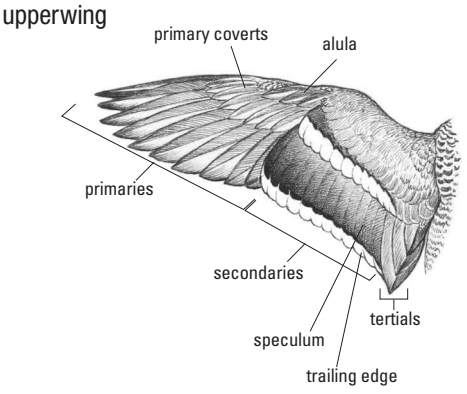
# BIRD TOPOGRAPHY

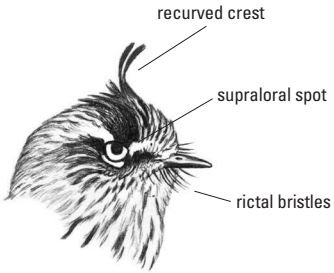


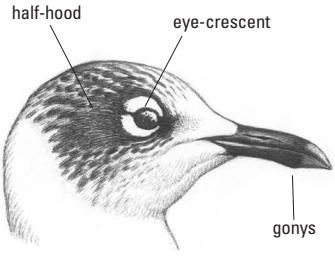



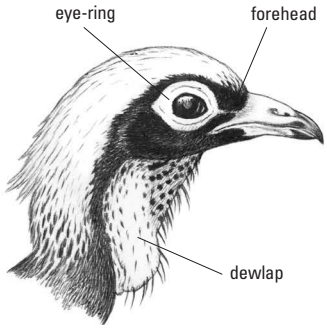



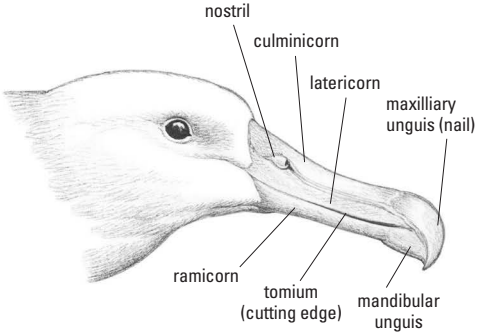



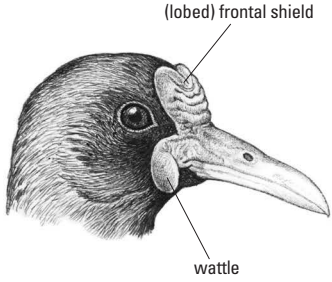



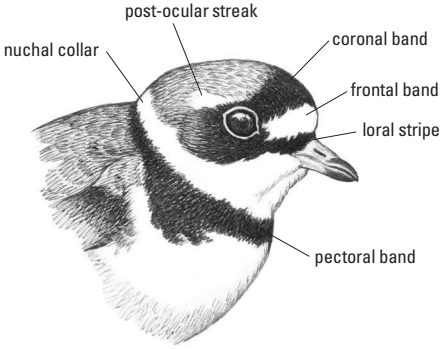

recurved crest
supraloral spot
rictal bristles

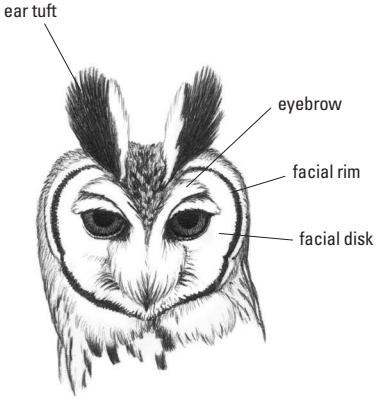

half-hood
eye-crescent
gonys

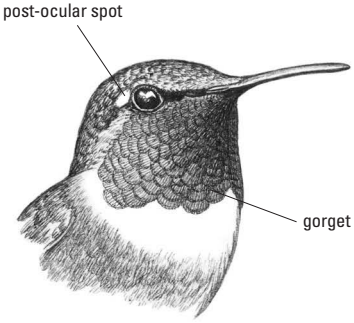

eye-ring
forehead
dewlap


nostril
culminicorn
latericorn
maxilliary unguis (nail)
ramicorn
tomium (cutting edge)
mandibular unguis


(lobed) frontal shield
wattle

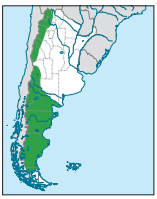

post-ocular streak
nuchal collar
coronal band
frontal band
loral stripe
pectoral band


ear tuft
eyebrow
facial rim
facial disk


post-ocular spot
gorget

# PLATE 1: RHEAS AND SERIEMAS

***Rhea*** Unmistakable long-necked and long-legged flightless birds. Males larger, especially in Greater Rhea. Lesser Rhea was formerly placed in the genus *Pterocnemia*.



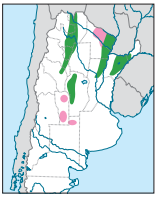
Lesser Rhea *Rhea pennata* 90 cm

Puna, NW Andean and Patagonian steppe. **ID Adult *garleppi*** (Jujuy to Mendoza): Breeding plumage is rather brown, thickly spotted with white, especially on the shoulder. **Adult *pennata*** (Patagonia north to w. Mendoza): Considerably greyer than *garleppi* with smaller spots. Non-breeding birds of both ssp. lack or show reduced spotting. Chicks have a complex black, brown and white-striped pattern. [Suri, Choique]

Greater Rhea *Rhea americana* 140 cm

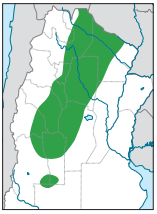
Widespread in N and C lowlands. **ID Adult** ♂: Black crown, base of neck and sides of breast with unmarked grey back. **Adult** ♀: Smaller than ♂ with black restricted to sides of neck base. **Juvenile** Smaller still, with brown plumage and base of neck. Chicks are pale brown and white with striped backs. **Voice** Loud, extremely low-pitched, booming calls are ventriloquial. [Ñandú]

***Cariama* and *Chunga*** Extremely large, terrestrial and arboreal, open-country carnivorous predators with long neck and tarsus. Rarely fly except when pressed; both species exhibit thickly barred black-and-white raptor-like wings.



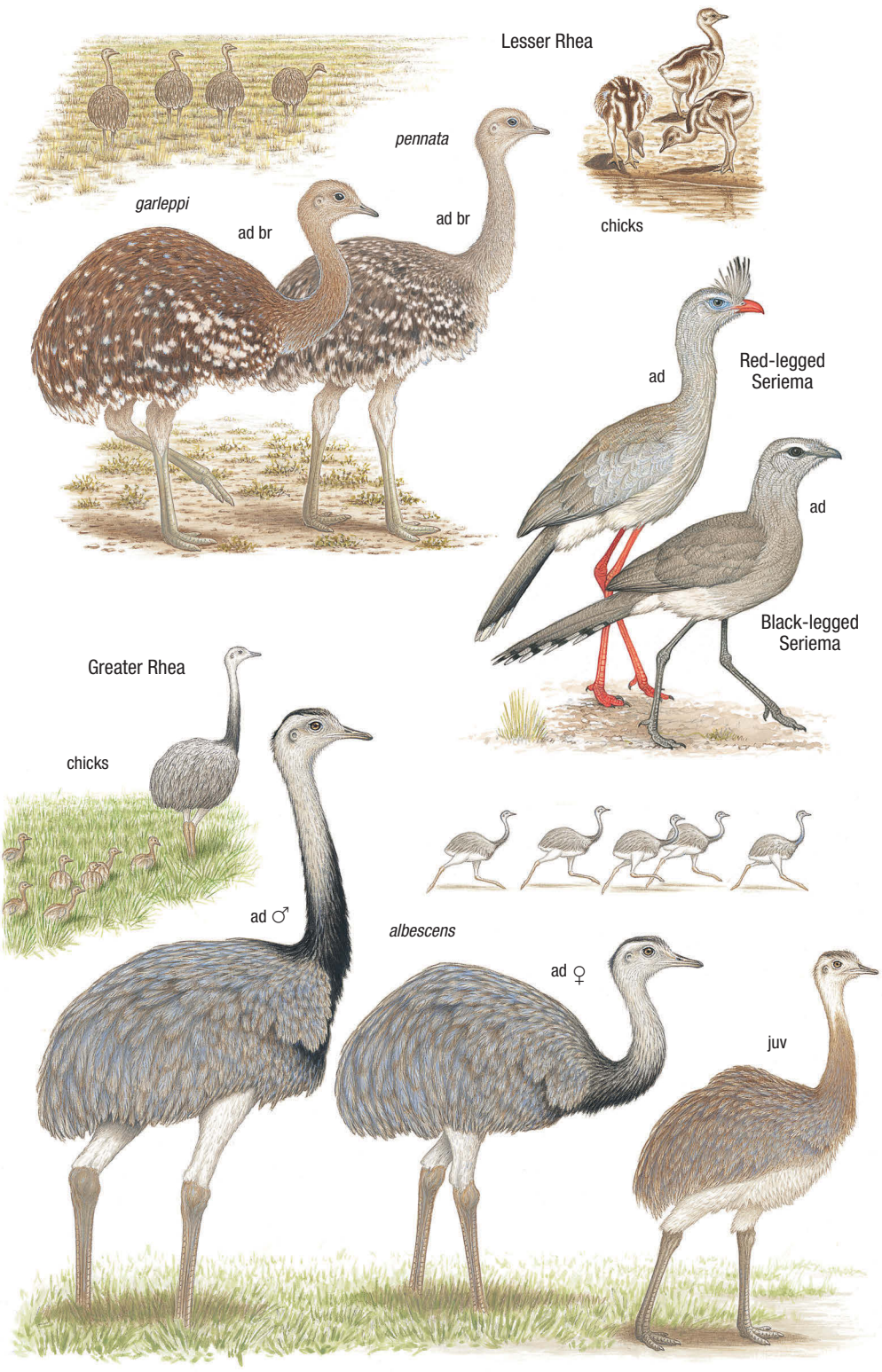
Red-legged Seriema *Cariama cristata* 92 cm

N Mesopotamia, humid and sierran chaco. **ID Adult**: Unmistakable with well-developed frontal crest, red bill and tarsus. Overlaps locally with Black-legged Seriema. **Voice** Loud and slow duetting calls are more bubbly and descend in pitch rapidly, unlike Black-legged Seriema. [Chuña Patas Rojas]



Black-legged Seriema *Chunga burmeisteri* 81 cm

Dry chaco and monte desert. **ID** Similar to Red-legged Seriema in shape and habits but notably smaller and lacks the frontal crest. **Adult**: Blackish bill and dark grey tarsus. Note conspicuous white supercilium. Overlaps locally with Red-legged Seriema. **Voice** Duets are similar to Red-legged and difficult to differentiate, but notes are harsher, less musical and more evenly pitched. Short song is more cackling and kookaburra-like. [Chuña Patas Negras]


Lesser Rhea
chicks
*pennata*
ad br
*garleppi*
ad br
Red-legged Seriema
ad
ad
Black-legged Seriema
Greater Rhea
chicks
ad ♂
*albescens*
ad ♀
juv

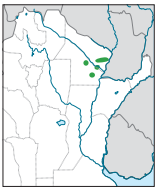
***Crypturellus*** Small to large tinamous of forest and light woodland. All species are best located by their distinctive voices.

Small-billed Tinamou *Crypturellus parvirostris* 23 cm

Forest, scrub and plantations in Misiones; rare in Yungas foothills. **ID** Overlaps with somewhat larger Tataupa Tinamou. **Adult**: Differs by fairly bright reddish-pink tarsus, duller upperparts and greyish-olive or olive breast. **Voice** A few accelerating trills followed by longer descending trills, sometimes in an extended series. [Tataupá Chico]

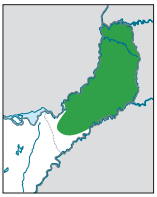
Tataupa Tinamou *Crypturellus tataupa* 25.5 cm

Widespread in N woodlands and foothill forest. **ID** Adult: Plumbeous-grey crown and neck, becoming blue-grey on breast. Rich purplish-rufous upperparts. Bill longer and brighter than Small-billed Tinamou, being plastic orange-red, but tarsus much duller pinkish, brown or grey. Compare with Brown Tinamou in Paraná forest and Undulated Tinamou in humid chaco woodlands. **Voice** Most frequent song comprises 4–6 short, explosive, stuttered, mostly descending trills; more rarely, a long series of slowly descending trills that accelerates towards the end. [Tataupá Montaraz]



Undulated Tinamou *Crypturellus undulatus* 33 cm

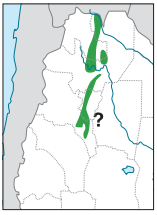
Very local in humid chaco woodlands of e. Chaco and e. Formosa. **ID** Adult: Rather uniform brown above but finely vermiculated black at close range. Contrasting whitish throat and rufescent lower foreneck and upper breast. Creamy belly and cinnamon wash over brown-barred flanks. Creamy tarsus. Overlaps with Tataupa Tinamou. **Voice** Song comprises 4 deep slurred whistles, inflected upwards at end. [Tataupá Listado]



Brown Tinamou *Crypturellus obsoletus* 29.5 cm

Paraná forest. **ID** Adult: Grey head and neck with paler throat. Rich russet-brown mantle. Vinaceous breast, becoming paler on belly and flanks which show blackish crescents. Pale olive tarsus. Overlaps with Solitary, Small-billed and Tataupa Tinamous. **Voice** Song is a long series of frenetic accelerating trills. [Tataupá Rojizo]

***Rhynchotus*** Large long-necked grassland tinamous with short hind toe and long decurved bill used for digging. Striking rufous primaries visible in flight. Both species are best located by their distinctive voices.

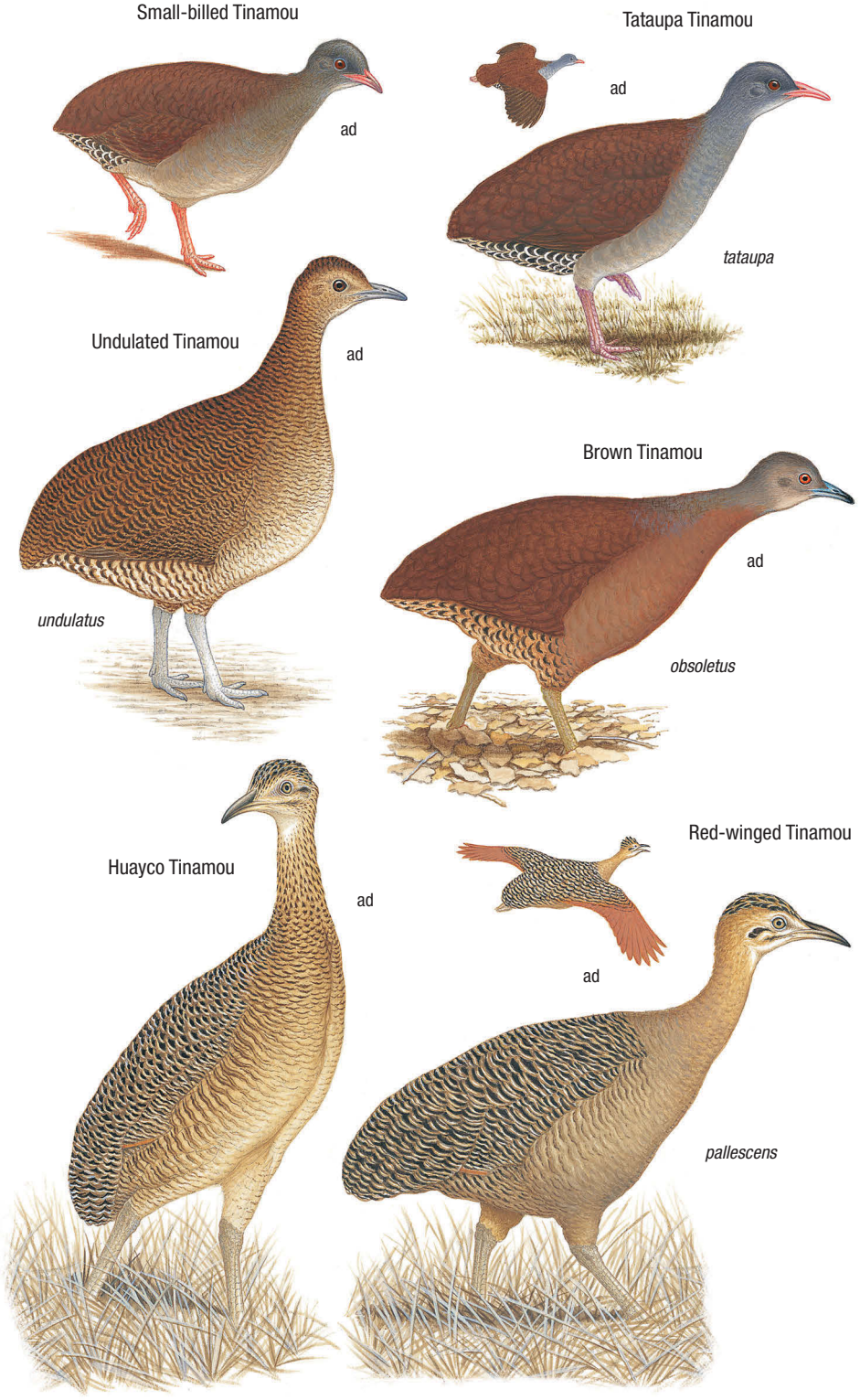



Huayco Tinamou *Rhynchotus maculicollis* 41 cm

Grasslands in the NW Andes. **ID** Adult: Resembles Red-winged (no definite overlap) but more spotted, rather than barred, on upperparts and black-streaked foreneck. Rufescent breast helps to distinguish from Ornate Tinamou. **Voice** Two-note, onomatopoeic ascending-descending whistle. [Guaipo]

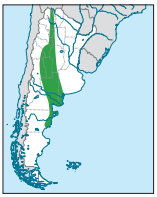
Red-winged Tinamou *Rhynchotus rufescens* 41 cm

Grasslands in the NE and C lowlands. **ID** Adult: Upperparts barred brown and cream. Grey breast. Birds from campos region lack grey on the breast and have richer, more ochraceous neck. **Voice** Four-note descending whistled call, with longer pause between first and second notes. [Colorada]


Small-billed Tinamou
ad
Tataupa Tinamou
ad
tataupa
Undulated Tinamou
ad
undulatus
Brown Tinamou
ad
obsoletus
Huayco Tinamou
ad
Red-winged Tinamou
ad
pallescens

# PLATE 3: TINAMOUS II

***Nothura*** Small tinamous of open grassland, semi-desert and agricultural land. Best located by their confusingly similar voices.



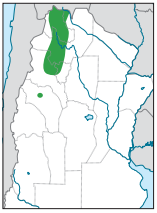
## Darwin's Nothura *Nothura darwinii* 26.5 cm

Grasslands and crops in Andean foothills and W lowlands south to N Patagonia. **ID** Adult: Generally paler than more richly coloured Spotted Nothura (some areas of overlap) with shorter tarsus, shorter neck, more linear breast streaking, separated by whitish intermediate streaks, and fine white dorsal streaking. Compare with Brushland Tinamou. **Voice** Trill (10–11 notes/sec) is much slower than Spotted Nothura. Slow whistled song often continues into a trill and finishes in a short series of slower notes. Both species can give very similar songs without the distinctive ending. [Inambú Pálido]

## Spotted Nothura *Nothura maculosa* 26.5 cm

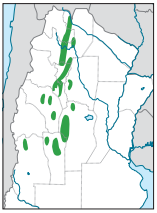
Widespread in N and C lowlands. **ID** Adult: Highly variable small grassland tinamou with a spotted breast. Generally more richly coloured than Darwin's Nothura and with a longer tarsus and neck. **Voice** Trill (16–17 notes/sec) is much faster than Darwin's Nothura. Slow whistled song finishes with short series of faster, distinctive, mildly accelerating notes. Both species can give very similar songs without the distinctive ending. [Inambú Campestre]

***Nothoprocta*** Medium-sized and large tinamous of grasslands, light woodlands and scrub. All species are best located by their distinctive voices.



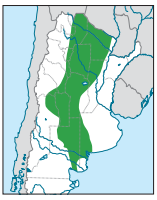
## Ornate Tinamou *Nothoprocta ornata* 36 cm

Pre-puna and puna grasslands. **ID** Adult: Erectile blackish crown. Broad, often puffed out, cinnamon flanks are diagnostic. Limited overlap with rufous-winged Huayco Tinamou, but mainly overlaps with smaller, grey-breasted Andean Tinamou and very different, larger Puna Tinamou. **Voice** Loud ascending drawn-out whistle, sometimes followed by a soft low-pitched grunt, is flatter than Andean Tinamou. [Inambú Serrano]



## Andean Tinamou *Nothoprocta pentlandii* 29 cm

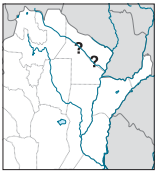
Scrub and light woodlands in the NW Andes and C Sierras. **ID** Adult *doeringi* (C Sierras): Decurved pinkish bill, yellowish tarsus, bushy crown and dark grey face and underparts, finely spotted white. Adult *pentlandii* (NW Andes): Paler grey foreneck and breast. Browner back and wings. **Voice** Short sudden loud whistle ascends faster than Ornate Tinamou. Compare with Ornate and Huayco Tinamous. [Inambú Silbón]



## Brushland Tinamou *Nothoprocta cinerascens* 34 cm

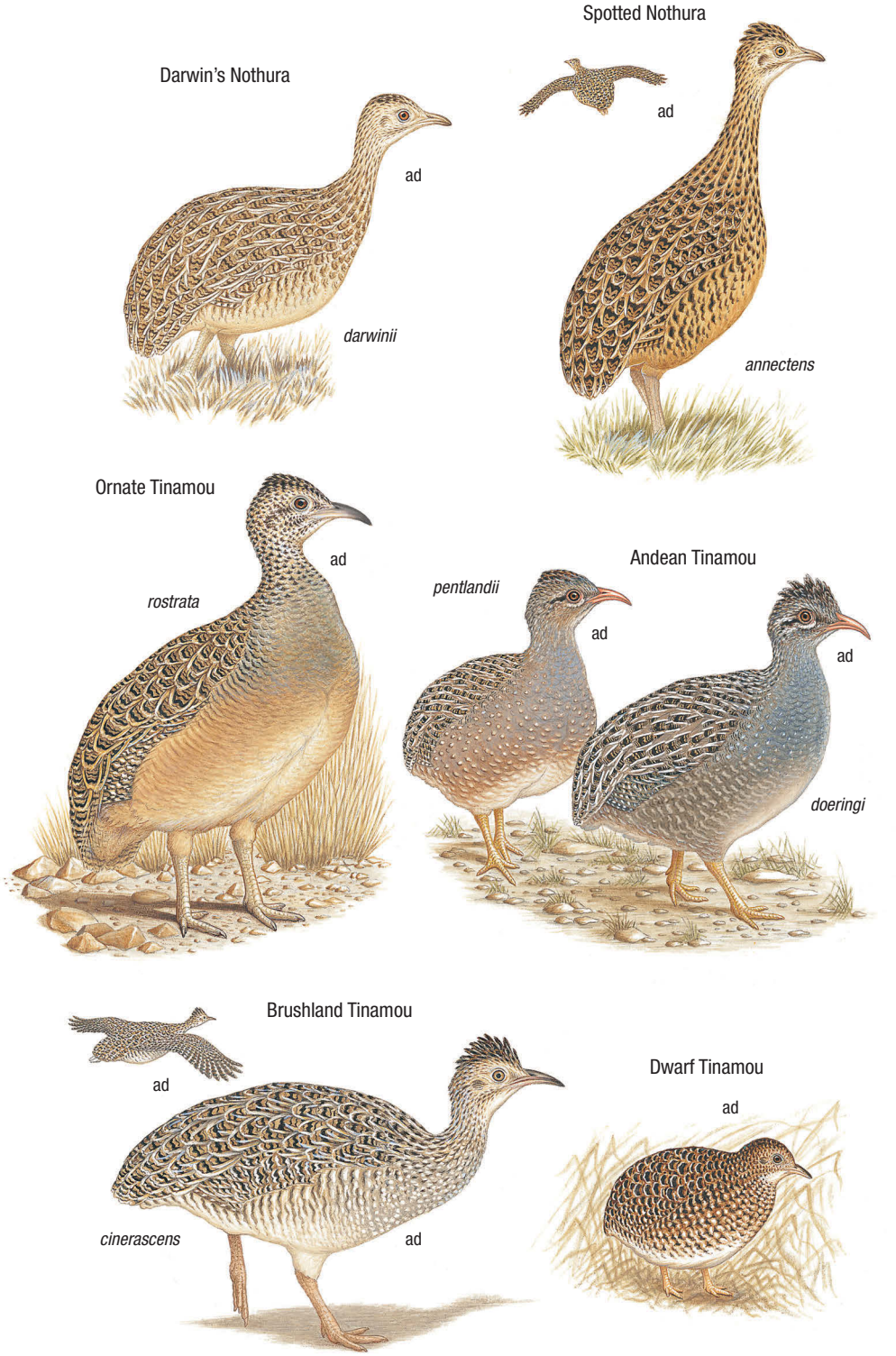
Monte desert and farmland in dry chaco. **ID** Adult: Bushy erectile black crown. Greyish upperparts heavily streaked white, and breast spotted white. Overlaps broadly with Darwin's Nothura, and with Andean Tinamou in the sierran foothills. **Voice** Loud series of 6–10 clear whistles, rising slightly in pitch and often becoming disyllabic towards the end. [Inambú Montaraz]

***Taoniscus*** Diminutive savanna tinamou with distinctive voice.



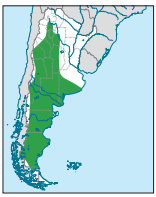

## Dwarf Tinamou *Taoniscus nanus* 16 cm

Historical records from the Río Bermejo region of Formosa or Chaco. **ID** Adult: Rather prominent black checkered pattern on the mantle and wing-coverts with contrasting white throat. Breast and flanks barred with black. **Voice** Insect-like voice, consisting of a long series of short, evenly spaced high-pitched whistles. [Inambú Enano]


Darwin's Nothura
ad
darwinii
Spotted Nothura
ad
annectens
Ornate Tinamou
ad
rostrata
Andean Tinamou
pentlandii
ad
ad
doeringi
Brushland Tinamou
ad
cinerascens
ad
Dwarf Tinamou
ad

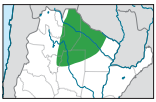
# PLATE 4: TINAMOUS III AND WOOD QUAIL

***Eudromia*** Large tinamous with distinctive recurved crests and double white head and neck stripes. No hind toe. No other crested tinamous occur in the range of each species. Often seen in trios during breeding season, otherwise in flocks.



Elegant Crested Tinamou *Eudromia elegans* 41 cm

Widespread with 8 ssp. in the lowlands west of the Río Paraná; mainly in Andean scrub and Patagonian steppe. **ID** Adult *elegans* (C Argentina): Dark brown upperparts, finely spangled with small buff spots. Extensive flank barring. Adult *intermedia* (NW Andes to 2850 m): From *elegans* by paler brown upperparts with larger buff spotting, and clearer belly with diffuse flank markings. **Voice** Low-pitched whistle *WE-see-u* with final note slightly lower-pitched. [Martineta Copetona]



Quebracho Crested Tinamou *Eudromia formosa* 41 cm

Dry chaco. **ID** Adult: From Elegant Crested (no definite overlap) by presence of black ladder-barring on upperparts, with pairs of buff spots, and thick black chevrons on breast and flanks. **Voice** Two or three whistled ascending liquid notes with last one often lower-pitched. [Martineta Chaqueña]

***Tinamotis*** Large tinamous of desert scrub and grasslands, with short tarsus, no hind toe and broad toe pads. Most often seen in trios. Both species show diagnostic triple white stripes on the head and neck, but lack crests. Both species are best located by their distinctive voices.

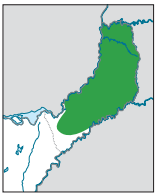

Puna Tinamou *Tinamotis pentlandii* 42 cm

Puna grasslands. **ID** Adult: Rufous belly and vent. Overlaps only with Ornate Tinamou. **Voice** Medium-pitched whistled *TOO-WHA* repeated incessantly and usually given in chorus. [Quiula Puneña]

Patagonian Tinamou *Tinamotis ingoufi* 37 cm

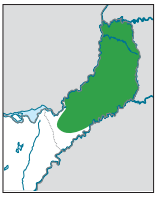
Patagonian steppe; mainly Santa Cruz. **ID** Adult: Rufous primaries and cinnamon belly and vent. Overlaps only with Elegant Crested Tinamou. **Voice** Medium-pitched, melancholic and descending whistled *PEE-WOOO* often given in chorus. [Quiula Patagónica]

***Tinamus*** Very large forest tinamou with proportionately very small head. This genus roosts in trees.



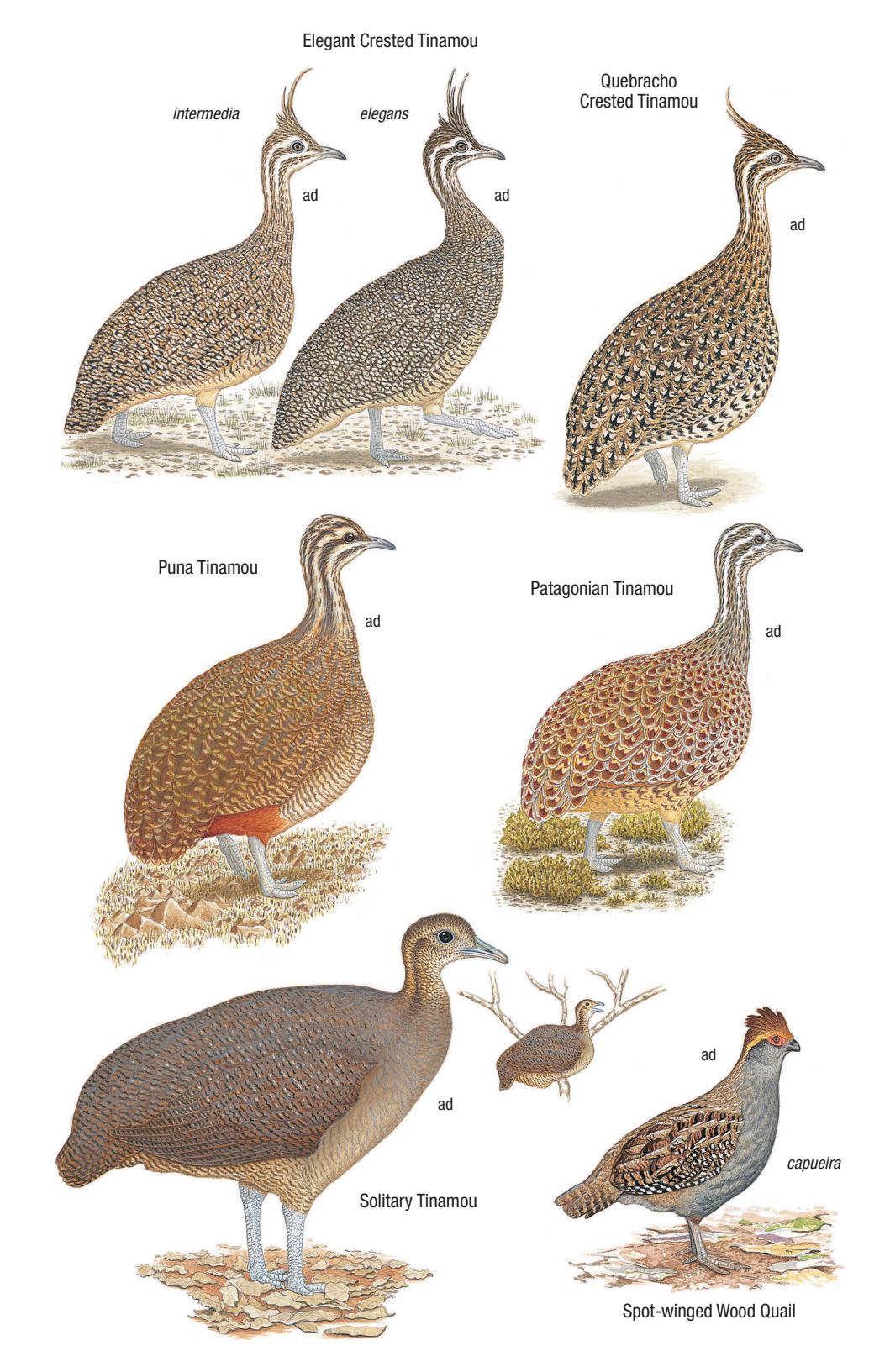
Solitary Tinamou *Tinamus solitarius* 46 cm

Paraná forest. **ID** Adult: Rusty neck stripe, which can appear creamy in poor light. Brown upperparts with fine wavy black barring. Whitish throat and brownish-grey breast. **Voice** Low-pitched tremulous crepuscular whistle resonates in the forest. [Macuco]



Spot-winged Wood Quail *Odontophorus capueira* 28 cm

Paraná forest. **ID** Gregarious forest quail with loud crepuscular voice. Adult: Pink skin around eye, erectile brown crest, rufous forehead and tawny supercilium. Wings spangled with white spots. Slate-grey underparts. **Voice** Loud crepuscular voice is a monotonous series of rich disyllabic *OO-Rúk* calls with the second note higher-pitched. [Urú]

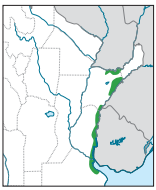

Elegant Crested Tinamou
intermedia
elegans
ad
ad
Quebracho
Crested Tinamou
ad
Puna Tinamou
ad
Patagonian Tinamou
ad
ad
ad
Solitary Tinamou
ad
capueira
Spot-winged Wood Quail

# PLATE 5: GUANS, CHACHALACA AND CURASSOW

***Penelope*** Large brown, monogamous, forest-dwelling cracids with hanging red gular sac. Spectacular wing-whirring displays at dawn and dusk. Alarm voices are similar to calls, but generally, louder, quicker and often hysterical when startled.

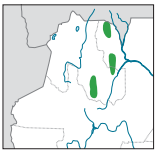
## Rusty-margined Guan *Penelope superciliaris* 61 cm

Paraná forest. **ID** Adult: Grey-brown breast with paler greyish fringes creating scaly effect. Tertials, secondaries and greater-coverts fringed rufous when fresh. Often looks darker in forest interior. Unconfirmed overlap with Dusky-legged Guan in Misiones. **Voice** Low-pitched, fairly well spaced, coarse grating *kargh, kargh, kargh* etc. [Yacupoí]



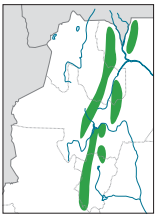
## Dusky-legged Guan *Penelope obscura* 58 cm

Gallery forest in the NE. **ID** Adult: Bronze-olive with sparse white streaking on breast, foreneck, scapulars and wing-coverts. Unconfirmed overlap with Rusty-margined Guan in Misiones. **Voice** Medium-pitched and disyllabic with or without terminal notes, lacking guttural rasps e.g. *Wikik Wikik-u, Wikik-u-u, Wikik, Wikik-u* etc. [Pava de Monte Ribereña]



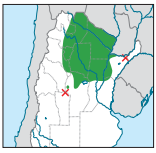
## Red-faced Guan *Penelope dabbenei* 63 cm

N Yungas forest at 1300–2700 m; rarely below 1650 m. Prefers tree-line alder forest. **ID** Adult: Short-legged guan with pink skin around the eye, narrow black forehead and contrasting frosty white forecrown or supercilium. Indistinct white streaking on the mantle, scapulars, wing-coverts and breast. Warm chestnut belly and vent. Bronzy tail. Overlaps with Yungas Guan below 2000 m. **Voice** Distinctive *Kee-Wok* calls. [Pava de Monte Alisera]



## Yungas Guan *Penelope bridgesi* 79 cm

Yungas forest to 2000 m. **ID** Largest guan. Adult: Prominent white streaks on mantle, scapulars and wing-coverts, and sparser streaking on the breast. Dark grey facial skin. Very long and broad black tail. Overlaps with Red-faced Guan and Chaco Chachalaca. **Voice** Low-pitched whistles mixed with guttural rasps e.g. *SWig SWI-u, SWig-u KREG, swig-u, u, KREG KREG KREG* etc. Tax note 1. [Pava de Monte Yungueña]



## Chaco Chachalaca *Ortalis canicollis* 60 cm

Humid and dry chaco, ranging into Yungas foothill forest. **ID** Relatively small, noisy gregarious cracid. Arboreal and terrestrial. Adult: Red facial skin and small dewlap. Greyish head and neck. Rufous vent and chestnut tips to outer tail feathers; best seen in flight. **Voice** At dawn and dusk, a loud far-carrying cacophony of hoarse grating *char…. ChaRa-RaTá, ChaRa-RaTá, ChaRa-RaTá* etc. [Charata]

## Black-fronted Piping Guan *Pipile jacutinga* 71 cm

Rare in riverine Parana forest, especially with *Euterpe* palms. **ID** Slender-necked, black and white, mostly arboreal forest cracid with a mainly red dewlap. Adult: Striking white crown, nape, eye-ring and wing-coverts contrasting with predominantly black plumage. **Voice** Ascending series of 4–6 shrill high-pitched whistles, each louder than the previous. Wing rattle crepuscular display like *Penelope* guans. [Yacutinga]

## Bare-faced Curassow *Crax fasciolata* ♂ 94 cm; ♀ 89 cm

Rare in gallery forest of the humid chaco. Historical records from n. Corrientes and w. Misiones. **ID** Unmistakable large cracid, terrestrial and arboreal, sexually dimorphic, with erectile curly crest. Very reclusive. Adult ♂: Plumage mainly black with white lower belly and vent. Broad yellow cere around bill base. Adult ♀: Head and neck black. Upperparts black heavily barred white, extending onto breast. Rest of underparts cinnamon. Black tail, narrowly barred white and tipped cinnamon. **Voice** Best detected by hollow booming at dawn. Shrill whistled alarm calls. [Muitú]