Avian Models for 3D Applications

Characters and Procedural Maps by Ken Gilliland

Songbird ReMix

COOL 'N' UNUSUAL BIRDS 3

Manual

Field Guide

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Manual & Field Guide

Introduction

The “Cool ‘n’ Unusual Birds” series features two different selections of birds. There are the “unusual” or “wow” birds such as Luzon Bleeding Heart, the sleek Bohemian Waxwing or the patterned Pink-throated Twinspot. All of these birds were selected for their spectacular appearance. The “Cool” birds refer to birds that have been requested by Songbird ReMix users (such as the Hyacinth Macaw, American Redstart and Red-eyed Vireo) or that are personal favorites of the author (American Bushtit, Wrentit and Song Sparrow).

Overview and Use

The set is located within the **Animals : Songbird ReMix** folder. Here is where you will find a number of folders, such as **Bird Library**, **Manuals** and **Resources** . Let's look at what is contained in these folders:

- **Bird Library:** This folder holds the actual species and poses for the "premade" birds. Birds are placed into a "type" folder (such as "Birds of Prey (Order Falconiformes)" which for example would hold falcons, hawks and eagles). The birds for this set can be found in the following folder(s):
  - **Parrots and Cockatoos (Order Psittaciformes)**
  - **Perching Birds (Order Passerines)**
  - **Pigeons and Doves (Order Columbiformes)**
- **Manuals:** Contains a link to the online manual for the set.
- **Props:** Contains any props that might be included in the set
- **Resources:** Items in this folder are for creating and customizing your birds
  - **Bird Base Models:** This folder has the blank, untextured model(s) used in this set. These models are primarily for users who wish to experiment with poses or customize their own species of bird. When using physical renderers such as Iray and Superfly, SubD should be turned to at least “3”. For DAZ Studios 3Delight renders, the SubD must be turned from the “High Resolution” setting to the “Base” setting (otherwise some areas will render incorrectly transparent).

Poser Use

Select **Figures** in the **Runtime** Folder and go to the **Animals : Songbird ReMix** folder. Select the bird from the renderer *Firefly or Superfly*) folder you want and simply click it to load. Some birds in the Songbird ReMix series may load with attached parts (*Conformers*) such as tail or crest extensions. Some of these parts have specific morphs. You will need to click on the attached part to access those controls. Associated poses can be found in the same folder- **Bird Library : (Type) : Poses**.

DAZ Studio Use

Go to the **Animals : Songbird ReMix** folder. Select the bird from the renderer (*3Delight or Iray*) folder you want and simply click it to load. Some birds in the Songbird ReMix series may load with attached parts (*Conformers*) such as tail or crest extensions. Some of these parts have specific morphs. You will need to click on the attached part to access those controls. Associated poses can be found in the same folder- **Bird Library : (Type) : Poses**. **Note:** Using the "Apply this Character to the currently selected Figure(s)" option **will not** properly apply the correct scaling to the bird selected. It is better to delete the existing character first and load the one you want to use.

One Folder to Rule Them All

When I reworked the entire Songbird ReMix library starting in 2018, I decided to abandon the way the birds were sorted (by product name) and choose an Ornithological approach. All birds are found in the Bird Library folder and are arranged by type of bird. This approach is hopefully easier for most to find what bird they are looking for. Admittedly, it will take some getting use to for some longtime users, but I've always approached the Songbird ReMix series as a learning tool as well as a graphics tool, so hopefully some knowledge will rub off by seeing how birds are grouped.

Probably the most deceiving subfolder in the **Bird Library** is **"Perching Birds (Order Passeriformes)".** This is folder you probably will end up "favoriting" because this one folder (Passeriformes) **holds more than 50% of all birds.** Perching birds range from cardinals and jays to chickadees, crow and swallows.

Finding the bird you want within the **"Perching Birds (Order Passeriformes)"** folder can be daunting, even for an experienced birder (such as myself), so I've included an online reference tool within this folder that helps to make your search easier. Click the **"Perching Birds Finder"** icon and when loaded, look at the first column and search for the type of bird you want. For example, I want a "manakin" (a bird common to Central and South America). Scroll down the first column alphabetically and stop on "manakin". Looking across to the second column, you will now know that manakins can be found in the "Tyrant Flycatchers & their Allies" subfolder.

Physical-based Rendering

Iray and **Superfly** requires more CPU and memory horsepower than the legacy renderers because of ray-trace bounces and higher resolution meshes needed for displacement. Poser's **Superfly** renderer will require that the "Min Transparent Bounces" be set to **at least 16** and that the "Max Transparent Bounces" be set to **at least 32** in render settings. Superfly renders may show artifacts in the head area. This is a known Poser issue and may be addressed in the future. Increasing the SubD may minimize this issue.

Posing & Shaping Considerations

This volume has various species, so when using generic poses not every pose will work perfectly with every bird. You may find that some minor alteration on the stock poses may be warranted.

Here are some of the most common alterations you may need to make:

- Birds will not be flat on the zero plane due to leg size and overall scale.
- Because of the numerous beak shapes, closing the beak may range from 0.5 to 1. Usually 0.8 is about right.
- **Raise Upper Beak** ***(in Action Controls):*** This morph is a "one size fits all" control. Because of the variety of beak shapes. It may not work with all birds.
- **Tongue poke-through** (especially when the beak is open). This can be easily solved by using the **Throat-Fuller1 & 2** morphs (*found in Creation Control/Head Shapes*).

IK Concerns

Some poses may go askew when IK is turned on. By default, Poser's IK feature is turned off when loading a bird. To turn it on, select the "Figure" category from the main tool bar and "Use Inverse Kinematics" from the submenu.

By default, DAZ Studio's IK feature is turned on when loading a bird. This will cause the thigh and shin rotations change when the character is moved. The **CTRL K** keypress will turn IK on and off in DAZ Studio. IK doesn't work that well in Studio, so I suggest selecting the character in the **Scene tab** and simply deleting the two IK body parts to remove IK.

Where to find your poses

Type Folder	For what species?
Parrots and Cockatoos (Order Psittaciformes)	All Parrots
Perching Birds (Order Passeriformes) Poses can be found in "Universal Poses" & "type" folders	All Passerines
Pigeons and Doves (Order Columbiformes)	All Pigeons and Doves

Where to find your birds

Type Folder	Bird Species
Parrots and Cockatoos (Order Psittaciformes)	Hyacinth Macaw
Perching Birds (Order Passeriformes) Chickadees, Tits & their Allies	Horned Lark
Perching Birds (Order Passeriformes) Crows, Jays and their Allies	Green Jay Inca Jay Formosan Blue Magpie
Perching Birds (Order Passeriformes) Fairywrens, Scrubwrens & their Allies	Purple-crowned Fairywren
Perching Birds (Order Passeriformes) Leaf-warblers and their Allies	Bushtit
Perching Birds (Order Passeriformes) Kinglets & their Allies	Taiwan Firecrest
Perching Birds (Order Passeriformes) NW Sparrows & their Allies	Song Sparrow
Perching Birds (Order Passeriformes) NW Warblers & their Allies	American Redstart
Perching Birds (Order Passeriformes) OW Warblers & their Allies	Wrentit
Perching Birds (Order Passeriformes) Silky Flycatchers & their Allies	Bohemian Waxwing
Perching Birds (Order Passeriformes) Sunbirds & their Allies	Pink-throated Twinspot
Perching Birds (Order Passeriformes) Vireos, Whipbirds & their Allies	Red-eyed Vireo
Pigeons and Doves (Order Columbiformes)	Luzon Bleeding-heart Pink-necked Green Pigeon

COOL 'N' UNUSUAL BIRDS 3

Field Guide

Parrots and their Allies

Hyacinth Macaw

Pigeons and Doves

Luzon Bleeding-heart
Pink-necked Green Pigeon

Perching Birds

Red-eyed Vireo
Green Jay
Formosan Blue Magpie
American Bushtit
Wrentit
Bohemian Waxwing
Horned or Shore Lark
Taiwan Firecrest
American Redstart
Song Sparrow
Pink-throated Twinspot

Common Name: Hyacinth Macaw
Scientific Name: *Anodorhynchus hyacinthinus*

Size: 39 inches (100 cm)

Habitat: South America; there are three main populations left in the northern part of South America. These are: 1- in the Pantanal region of Brazil and adjacent eastern Bolivia as well as northeastern Paraguay, 2- in the Cerrado region of the eastern interior of Brazil (Maranhão, Piauí, Bahia, Tocantins, Goiás, Mato Grosso and Minas Gerais), and 3- in the relatively open areas associated with the Tocantins River, Xingu River, Tapajós River, and the Marajó island in the eastern Amazon Basin of Brazil. It is possible that smaller, fragmented populations occur in other areas.

Hyacinth Macaws prefer palm swamps, woodlands, and other semi-open wooded habitats. They usually avoid dense humid forests, and in regions dominated by such habitats, they are generally restricted to the edge or relatively open sections (e.g. along major rivers). In different areas of their range these parrots are found in savannah grasslands, in dry thorn forest known as 'caatinga', and in palm stands, particularly the Moriche Palm (*Mauritia flexuosa*).

Status: Endangered. **Global Population:** 6,500 mature individuals with a decreasing trend. A very rapid population decline is suspected to have taken place over the last three generations, on the basis of large scale illegal trade, habitat loss and hunting. This is based on a precautionary assumption of a generation length of 15 years. This species was

reduced to an estimated 3000 birds by massive illegal trade in the period 1970–1990, with possibly as many as 10,000 being taken from the wild in the 1980s alone. The Hyacinth Macaw is protected by law in Brazil and Bolivia, and commercial export is banned by its listing on Appendix I of the Convention on International Trade in Endangered Species (CITES). There are a number of long-term studies and conservation initiatives in place; the Hyacinth Macaw Project in the Brazilian State of Mato Grosso do Sul, has carried out important research by ringing individual birds and has created a number of artificial nests to compensate for the small percentage of sites available in the region. The Minnesota Zoo with BioBrasil and the World Wildlife Fund are involved in Hyacinth Macaw conservation.

Diet: Nuts from native palms, such as acuri and bocaiuva palms. In Amazon region, the main food sources are *Maximiliana regia*, *Orbignya martiana* and *Astrocaryum*; in the Pantanal, *Scheelea phalerata* and *Acrocomia totai*; and in the dry northeastern part of its range, *Attalea funifera* and a*Syagrus coronata*, where most of the foraging done on ground. Other fruits sometimes also taken, as well an occasional snail.

Breeding: It is the largest parrot in the world and is completely blue except for its dark bill and bare yellow orbital ring and stripe at base of its lower mandible. The male and female are identical in external appearance, and juveniles resemble adults except they have shorter tails and the yellow on their faces is paler.

Nesting takes place between July and December, nests are constructed in tree cavities or cliff faces depending on the habitat. In the Pantanal region, 90% of nests are constructed in the manduvi tree (*Sterculia apetala*). Hollows of sufficient size are only found in trees of around 60 years of age or older, and competition is fierce. Existing holes are enlarged and then partially filled with wood chips.

The clutch size is one or two eggs, although usually only one fledgling survives as the second egg hatches several days after the first, and the smaller fledgling cannot compete with the first born for food. The incubation period lasts about a month, and the male will tend to his mate while she incubates the eggs. The chicks leave the nest, or fledge, at around 110 days of age, and remain dependent on their parents until six months of age. They are mature and begin breeding at seven years of age. Eggs are regularly predated by corvids, possums, coatis and most prolifically toucans.

Cool Facts: English ornithologist John Latham discovered the Hyacinth Macaw in 1790.

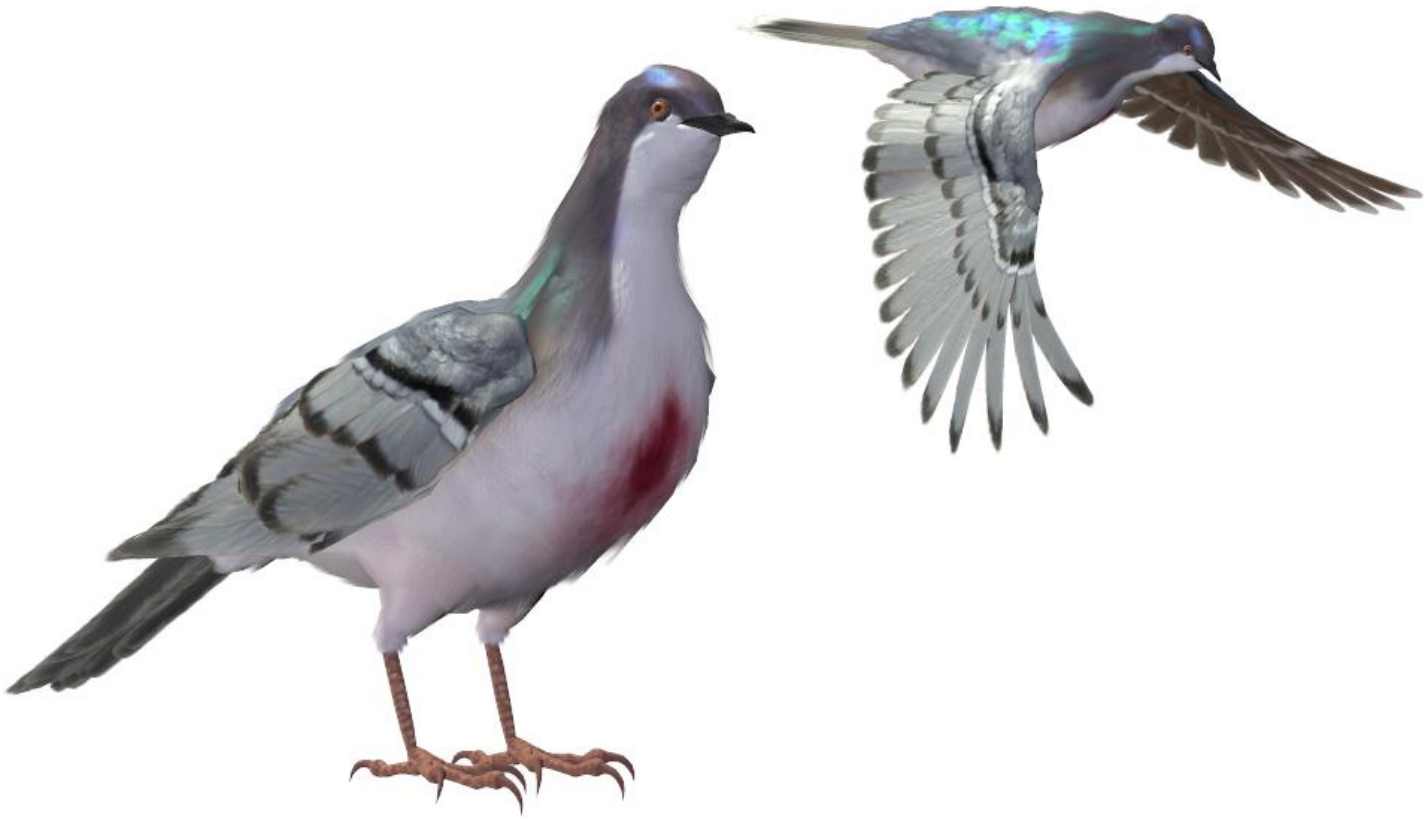
This macaws' beak is oversized and so strong that it is able to crack coconuts.

Common Name: Luzon Bleeding-heart
Scientific Name: *Gallicolumba luzonica*

Size: 12 inches (30 cm)

Habitat: Asia; the Philippines. The species is endemic to the central and southern parts of the large island of Luzon, and the neighboring small Polillo Islands, in the Philippines.

It lives in primary or secondary forests, and can be found at altitudes varying from sea level up to 1400 meters.



Status: Near Threatened. **Global Population:** Unknown amount of mature individuals. There is no data on population trends; however, it is suspected the species is in moderately rapid decline, owing to habitat loss, degradation, and hunting. Local people use it for meat, but its striking appearance means that there is also a market for it in the pet trade. A captive breeding project has been started in Australia.

Diet: Seeds, berries and grubs. It forages on the ground, searching the leaf-litter for seeds, fallen fruits and invertebrates.

Breeding: On its upper surfaces, the Luzon Bleeding-heart is slate gray in color, but because it is iridescent, it can appear to be purple, royal blue, or bottle-green, with the apparent color varying with lighting conditions. The belly and under wing areas are buff or chestnut. As in most pigeons, there is little sexual dimorphism; males tend to be larger and have a more pronounced red patch, and some authorities claim that the female has a purplish iris, though others dispute this. Body shape is typical of the genus, with a round body, a short tail and long legs.

They usually lay two eggs in each clutch.

Cool Facts: They get their name from a splash of vivid red color at the center of their white breasts. The Luzon Bleeding-heart is the species in which this feature is most pronounced, and on first sight it is hard to believe that the bird has not recently been wounded. A reddish hue that extends down the belly furthers the illusion of blood having run down the bird's front.

There are three subspecies. The races differ slightly, mainly in the coloration of their underparts.

- *G. l. griseolateralis.* It is found in northern Luzon (Northern Philippines). This races' forehead and crown is darker than nominate. It has a less clearly differentiated purplish nape, with darker gray wing-coverts, and the female has darker flanks and the under tail-coverts and the lower breast and abdomen are whiter
- *G. l. luzonica.* The nominate subspecies is found in central and southern Luzon and Polillo (Northern Philippines).
- *G. l. rubiventris.* It is found in the Viga–Gigmoto watershed on Catanduanes (Northeastern Philippines). It has a darker red and more extensive breast patch, a pale pinkish-brown belly washed pink, and pale brown under tail-coverts. It is also smaller.

Common Name: Pink-necked Green-pigeon
Scientific Name: *Treron vernans*

Size: 10.4-12.5 inches (26.5-32cm)

Habitat: Asia; Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

Its natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests.

Status: Least concern. **Global Population:** Unknown amount of mature individuals. It is common throughout much of its range, especially in lowlands in Greater Sundas. It has shown itself to be adaptive to second growth and other human-modified habitats. It is abundant in many parts of Sumatra.

Diet: Frugivorous; mostly figs, palm fruit and berries. They also nibble on flower buds. In Sungei Buloh, their favorite food include the fruit of the Macaranga, Cherry Tree (*Muntingia calabura*), small banyan figs (*Ficus benjamina*), and Singapore Rhododendron (*Melastoma malabathricum*).

Flies in dense flocks to and from feeding areas in early morning and late afternoon.

Breeding: The male Pink-necked is very handsome and colorful. The duller female is easily confused with those of other Green Pigeons and is best identified by her male consort who is usually nearby.

The nest is a flimsy platform of twigs. About 15-20 cm in diameter, and so thin that sometimes the contents can be seen from below. The male collects the nesting materials and passes them on to the female to assemble.. Pairs nest alone, preferring spots near open spaces, in bushes as low as 2m off the ground and up to 10m high in trees and palms. 1-2 white eggs are laid. Both parents take turns incubating them and both raise the young. Fledglings may remain near the nest for up to 1 week.

Cool Facts: The most fascinating feature of pigeons and doves is their ability to produce crop milk. During breeding season, special glands in the crops of both males and females enlarge and secrete a thick milky substance. The chicks drink this milk by poking their bills into the parent's throat. Thus, pigeons and doves can feed their young without having to incessantly hunt or forage for food.

Common Name: Red-eyed Vireo
Scientific Name: *Vireo olivaceus*

Size: 4.7-5.1 inches (12-13cm)

Habitat: North and South America; the breeding habitat is open wooded areas across Canada and the eastern and northwestern United States. These birds migrate to South America, where they spend the winter. The Latin American population occurs in virtually any wooded habitat in their range. Most of these are residents, but the populations breeding in the far southern part of this species' range (e.g. most of its range in Argentina, Uruguay, Paraguay and Bolivia) migrate north as far as Central America.

This vireo is one of the more frequent American passerine vagrants to Western Europe, with more than one hundred records, mainly in Ireland and Great Britain.

Status: Least Concern.
Global Population: 140,000,000 mature individuals. It is subject to nest predation by cowbirds. This species has undergone a small or statistically insignificant increase over the last 40 years in North America.

Diet: Insects; primarily caterpillars and aphids. Vireos glean insects while moving along branches. It kills larger prey by crushing or beating it against branches and holds food with its foot while eating. Occasionally vireos will eat berries, especially before migration.

Breeding: Sexes are alike. Adults have a gray to blue-gray crown that contrasts with the plain, grayish olive-green upper parts and the prominent whitish

supercilium. The lateral edges of the crown bordering the supercilium above form a sharp blackish line. There is a dusky eyeline extends from lores to behind the eye, where it gradually becomes less distinct. The auriculars and the sides of neck are pale olive-gray, and somewhat lighter and more grayish compared to rest of upper parts. The under parts are white, tinged with pale yellow when in fresh plumage. The iris is bright red to crimson, and rarely brownish red.

Immature vireos have brown eyes and yellower under parts than the adults.

The nest is a cup in a fork of a tree branch and is made of twigs, bark strips, grasses, pine needles, and lichen held together with spider web. The inner lining is comprised of grasses, plant fibers, and hair. Dull white speckled with reddish brown eggs are laid.

Cool Facts: One of the most common birds of the Eastern forests, the Red-eyed Vireo is heard far more than it is seen. It appears to be endlessly repeating the same question and answer. Among bird species it holds the record for most songs given in a single day- more than 20,000 songs.

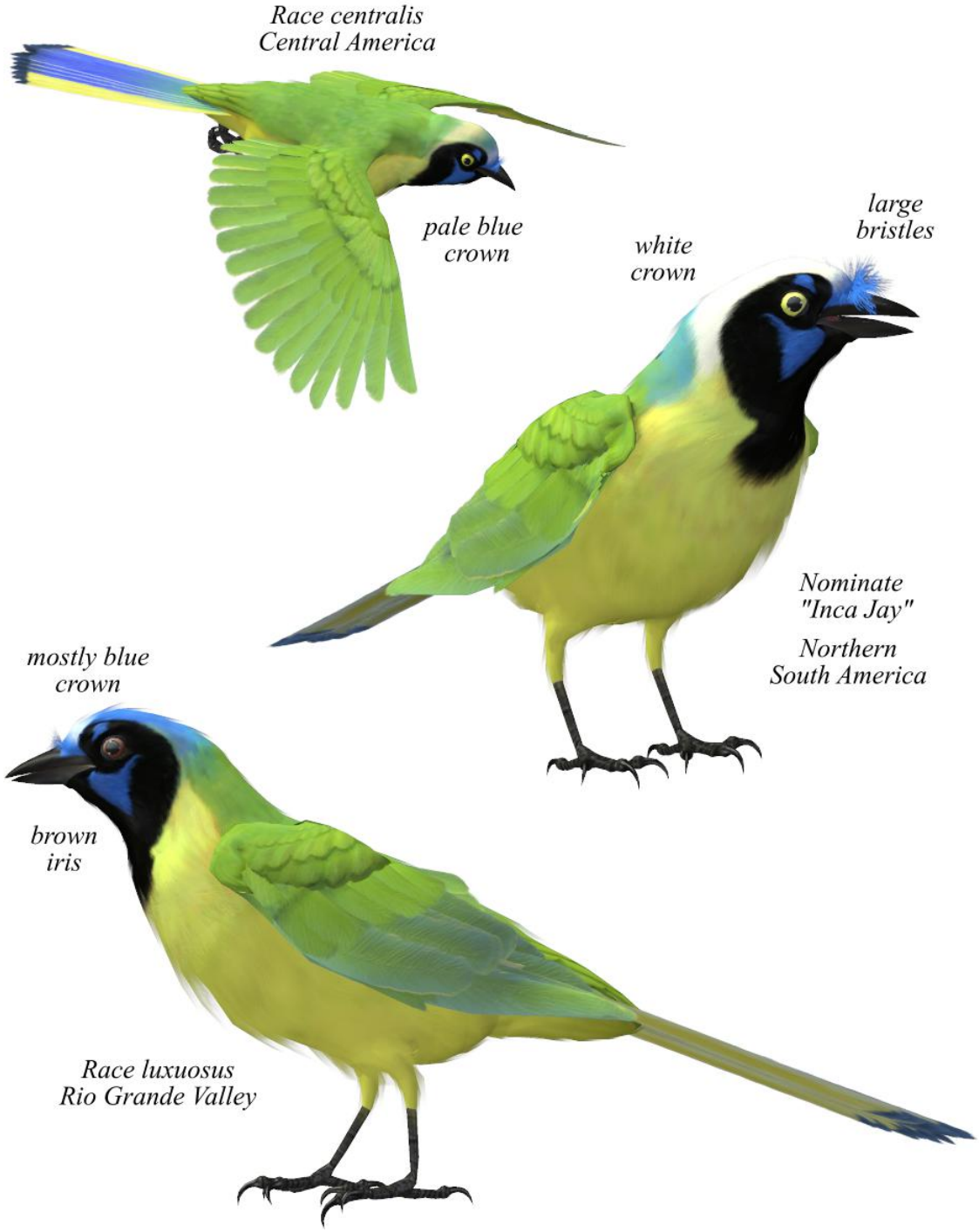
Red-eyed Vireos living year-round in South America may be a separate species.

Common Name: Green Jay
Scientific Name: *Cyanocorax luxuosus*

Size: 10-11.4 inches (25-29 cm)

Habitat: North America; Southern Texas south into Mexico and Central America.

Found in open woodland and brushy mesquite thickets.



Status: Least Concern. **Global Population:** Unknown amount of mature individuals. The range appears to be expanding in Texas.

Diet: Arthropods, vertebrates, seeds, and fruit. They take ebony (*Ebenopsis spp.)* seeds where these occur, and also any oak species' acorns, which they will cache. Meat and human scraps add to the diet when opportunity arises. Green Jays have been observed using sticks as tools to extract insects from tree bark.

Breeding: Sexes are alike. They have feathers of yellowish-white with blue tips on the top of the head, cheeks and nape. A black bib forms a thick band up to the sides of the head as well as a stripe through the eye line and one above it. The breast and under parts typically are bright to dull yellow, or strongly green-tinged in the far northernmost part of its range. The upper parts are rich green. The color of the iris ranges from dark brownish to hazel.

A green jay flock consists of a breeding pair, the current year's nestlings, and one-year-old, non-breeding jays from the previous year's nest. The one year-olds defend the territory, which aids the parents, but they are ejected from the family flock soon after the current year's nestlings have fledged.

Nests are a flimsy open cup of thorny twigs, usually lined with fine roots, vine stems, moss, and dry grass and are placed in trees. The female lays pale greenish white eggs with dark spots near large end.

Cool Facts: The Central American and South American populations of the green yay are separated by 1,500 km (900 mi). The two different groups differ in color, calls, and habitat use, and some argue, may be different species. The South American Green Jays are larger and have a crest in front of their eyes. It has been suggested that the North American taxa should be considered separate species, *Cyanocorax luxuosus*. If following this taxonomy, the northern species retains the common name Green Jay, while the South American population, which retains the scientific name *Cyanocorax yncas*, is renamed the Inca Jay.

Green Jay Group

- *C. y. glaucescens.* It is found from southern Texas to northeastern Mexico. It is dull, gray-green above, glaucous green and whitish yellow below with a brown iris.
- *C. y. speciosus*. Found on the Pacific slope of Mexico in Nayarit and Jalisco. It is large and brightly colored with brown iris.
- *C. y. vividus*. Found on the Pacific slope of southern Mexico (Colima) to western Guatemala. It is similar to *speciosus* but darker.
- *C. y. luxuosus*. Southern Texas (Rio Grande Valley) to eastern Mexico (Puebla and Veracruz). It is like *glaucescens* but is a darker green above and more green and yellowish below with a brown iris.

- *C. y. confusus*. Found in southeastern Veracruz to eastern Chiapas and western Guatemala. It is smaller and darker than *vividus* and like *luxuosus* but with a brighter yellow below and with a yellow iris.
- *C. y. centralis.* It is found in southeastern Mexico (extreme eastern Tabasco and adjacent parts of Chiapas eastward through extreme southern Quintana Roo), northern and eastern Guatemala, Belize and northern Honduras. It is larger than *maya* with larger bill. Similar to *confusus* with "clearer" yellow below with green tint. Its crown is a paler blue
- *C. y. maya.* It is found in southeastern Mexico (Yucatán Peninsula) and extreme southern Quintana Roo. It is like *centralis* and *confusus* but smaller with pure yellow below.

Inca Jay Group

- *C. y. galeatus.* It is found in the subtropical zone of Colombia west of the eastern Andes.
- *C. y. yncas.* The nominate subspecies is found in southwestern Colombia (subtropical zone, in valleys of upper Cauca, Patía, and San Miguel) southward through eastern Ecuador and Peru to central Bolivia (La Paz and Cochabamba)
- *C. y. cyanodorsalis.* It is found in the eastern Andes of Colombia and northwestern Venezuela.
- *C. y. andicolus.* It is found in the mountains of northern Venezuela
- *C. y. guatimalensis.* It is found in the mountains of northern Venezuela (Falcón eastward to Sucre and Anzoátegui).
- *C. y. longirostris*. It is found in the arid upper valley of River Marañón, in northern Peru.

Common Name: Formosan or Taiwan Blue-Magpie
Scientific Name: *Urocissa caerulea*

Size: 25-26 inches (64-65 cm)

Habitat: Asia; Taiwan. It is an endemic species living in the mountains of Taiwan at elevations of 300 to 1200m.

Status: Least Concern. **Global Population:** Unknown amount of mature individuals. Due to its endemism, the Taiwan Blue Magpie has been listed as a rare and valuable species (珍貴稀有保育類) and protected by Taiwan's Cultural Heritage Preservation Act (Traditional Chinese: 文化資產保存法) since 1989.

There is a small population of Red-billed Blue Magpies that have been introduced to Wuling Farm in Taichung County (now part of Taichung City). In 2007, three hybrids were found in Taichung, which has caused some concern to conservationists, who fear the Taiwan Blue Magpie could be threatened in a similar way to the Taiwan Hwamei. However, the Endemic Species Research Institute of Taiwan has been working to control Red-Billed Magpie populations by capturing individual birds and relocating their nests.

Diet: Omnivorous; snakes, rodents, small insects, plants, fruits, and seeds, with wild figs and papayas being their favorites. They are known to store leftovers on the ground and cover them with leaves for future retrieval. Sometimes they store food in leaves or branches.

They are usually encountered in small parties of six or seven individuals, presumably family groups, but larger gatherings can occur after the young have fledged. They are generally shy and wary, keeping very much inside forest canopy. Although reluctant to cross open stretches of countryside, they will do so in "follow-my-leader" manner (several short flaps and a glide). they have been senn foraging at all levels, including the forest floor. On the gound, they make bounding hops with tail raised, with the very end curving down slightly.

Breeding: The plumage of males and females look alike. Their head, neck and breast are black; eyes are yellow; bill and legs are red; the rest of the plumage on the bird is a rich dark blue to purple in color. They also have white markings on the wings and the tail.

The Blue Magpie is monogamous. Females incubate eggs while males help out with nest building and feeding. Their nests are usually found in the woods and weeds of rendezvous areas. They are woven with twigs and weeds in the shape of a bowl. Most are built on higher branches from March to April. The eggs usually number 3-8 and are olive green in color, with dark brown marks. Hatching takes 17–19 days and the success rate is 78.3%. This will yield 3-7 chicks per nest. Blue Magpies have a strong nest defense behavior, and will attack intruders mercilessly until they retreat.

Cool Facts: In the 2007 National Bird Voting Campaign held by Taiwan International Birding Association, there were over 1 million votes cast from 53 countries. The Blue Magpie defeated the Mikado Pheasant and was chosen as Taiwan's national bird, though it has yet to be formally accepted.

It is also called the Taiwan Magpie (Chinese: 臺灣藍鵲) or the "Long-tailed Mountain Lady" (Chinese: 長尾山娘)

Common Name: American Bushtit
Scientific Name: *Psaltriparus minimus*

Size: 2.8-3.1 inches (7-8 cm)

Habitat: North America; a year-round resident of the western United States and highland parts of Mexico, ranging from Vancouver through the Great Basin and the lowlands and foothills of California to southern Mexico and Guatemala.

The American Bushtit inhabits open woods or scrubby areas, particularly pine-oak woodlands and chaparral, as well as suburbs and parks. They also live in scrub, sagebrush, streamside woods and thickets, in addition to forests of pinyon pine, juniper, and other evergreens up to about 11,500 feet elevation.

Status: Least Concern. **Global Population:** Unknown amount of mature individuals. Bushtits are common birds that adjust well to suburbs. Their population size and range have gradually expanded during the twentieth century, possibly because of growth in human settlements.

Diet: Small insects and spiders, including the very tiny scale insects that adhere to leaves and twigs, as well as other plant-feeding bugs, beetles, caterpillars, wasps, and ants. They less frequently eat plant material, but have been seen eating olives and willow seeds. American Bushtits are active and gregarious; foraging for small insects and spiders in mixed-species feeding flocks containing

species such as chickadees and warblers that number from 10 to over 40 individuals. Members of the group constantly make contact calls to each other that can be described as a short '*spit*'.

Breeding: It is a small, kinglet-sized, plain, grayish bird, with a long tail (46–62 mm, except in fledgling, where it is shorter). It has short wings, a small black bill, and a long black tarsi. Color and head markings vary geographically. Sexes are alike in appearance.

The male and female try out several nest sites by hanging spiderweb from mistletoe or other vegetation. They tend to build nests on branches or trunks of trees at any height from about 3 up to 100 feet.

Both male and female help build the remarkable hanging nest, a process that may go on for a month or more. The nest hangs up to a foot below its anchor point and has a hole in the side near the top that leads down into the nest bowl. The adults make a stretchy sac using spider webs and plant material, sometimes stretching the nest downward by sitting in it while it's still under construction. They add insulating material such as feathers, fur, and downy plant matter and camouflage the outside with bits taken from nearby plants, including the tree the nest is built in. While the nest is active all the adults associated with it (the breeding pair plus helpers) sleep in it. The pair typically reuses the nest for its second brood of the season.

A breeding Bushtit pair often has helpers at the nest that aid in raising the nestlings. This already rare behavior is made more unusual by the fact that the helpers are typically adult males. For most breeding birds, only one adult at a time sleeps on the nest, but all Bushtit family members sleep together in their large, hanging nest during the breeding season. Once the young fledge, they all leave the nest and thereafter sleep on branches.

Cool Facts: The American Bushtit is the only species in the family *Aegithalidae* found in the New World, and the only member of the genus *Psaltriparus*. It also is the smallest songbird in North America.

The "Black-eared" Bushtit was formerly considered a separate species (*P. melanotis*). It can be identified by its dark ear patch (the auricular). This polymorphism does not occur in the northern part of the American Bushtits' range, but is first noted near the Mexican border, primarily in Texas. Most individuals

with the black ear patch in that area are juvenile males, and none are adult females – some have only one or two dark lines on the face instead of a complete patch. The Black-eared form becomes more common southward in the northeastern (but not the northwestern) highlands of Mexico until from central Mexico south, all males have a complete black ear patch and even adult females have a black arc over the eye and usually a black line through the eye.

The oldest known Bushtit was 9 years, 1 month old.

Pacific Group

- *P. m. saturatus*. First reported by Ridgway in 1904. It is found in extreme southwest Canada (southeast Vancouver Island, southwest British Columbia) and extreme northwest United States (Puget Sound lowlands of northwest Washington, including Whidbey Island). The ventrum is washed with brownish, with the flanks smoky brown; the auriculars grayish; the crown brown; the dorsum brownish gray; the remiges and rectrices dark brown.
- *P. m. minimus.* First reported by Townsend in 1837. The nominate subspecies is found in the western United States from south-central Washington (Yakima Valley) and northern Oregon (Columbia River west of Cascades) southward along coast (west of the Coast Range) to southwest California (southward at least to Santa Barbara County).It is similar to *saturatus*, but paler overall.
- *P. m. californicus.* First reported by Ridgway in 1884. It is found in the interior of southern Oregon (Jackson, Klamath and Josephine Counties) south, east of the Coast Range, to south-central California to the Transverse Range (south to Kern County). It is like the nominate, but paler still, with the flanks only faintly smoky (purer brown), although populations at the western edge of this subspecies' range are intermediate toward *P. m. minimus*.
- *P. m. melanurus.* First reported by Grinnell and Swarth in 1926. It is found in coastal California from northern San Diego County (possibly from Los Angeles County) southward to northwest Mexico (northwest Baja California). It is like *minimus*, but the dorsum is grayer and the remiges and rectrices are blackish (not dark brown).
- *P. m. grindae.* First reported by Ridgway in 1883. It is found in the mountains of the Cape district of southern Baja California (southward from central Baja California to montane Baja California Sur) in western Mexico. It is similar to *californicus,* but the dorsum is clearer gray (less brown).

Interior Group

- *P. m. plumbeus.* First reported by Baird in 1854. It is a resident of the west-central and southern United States from central-eastern Oregon, southwest Idaho and southwest Wyoming, southward to eastern California (east watershed of Sierra Nevada, also Little San Bernardino Mts), southern Arizona, southern New Mexico, western Oklahoma and west and central Texas, and northern Mexico (northern Sonora, northwest Chihuahua). The ventrum is washed with gray; the auriculars brownish; the crown gray and the

dorsum grayish. The dorsal color varies from more purely gray in the western part of the subspecies' range to more olive-gray in the eastern part, and crown color becomes more concolorous west-to-east.

Melanotis Group

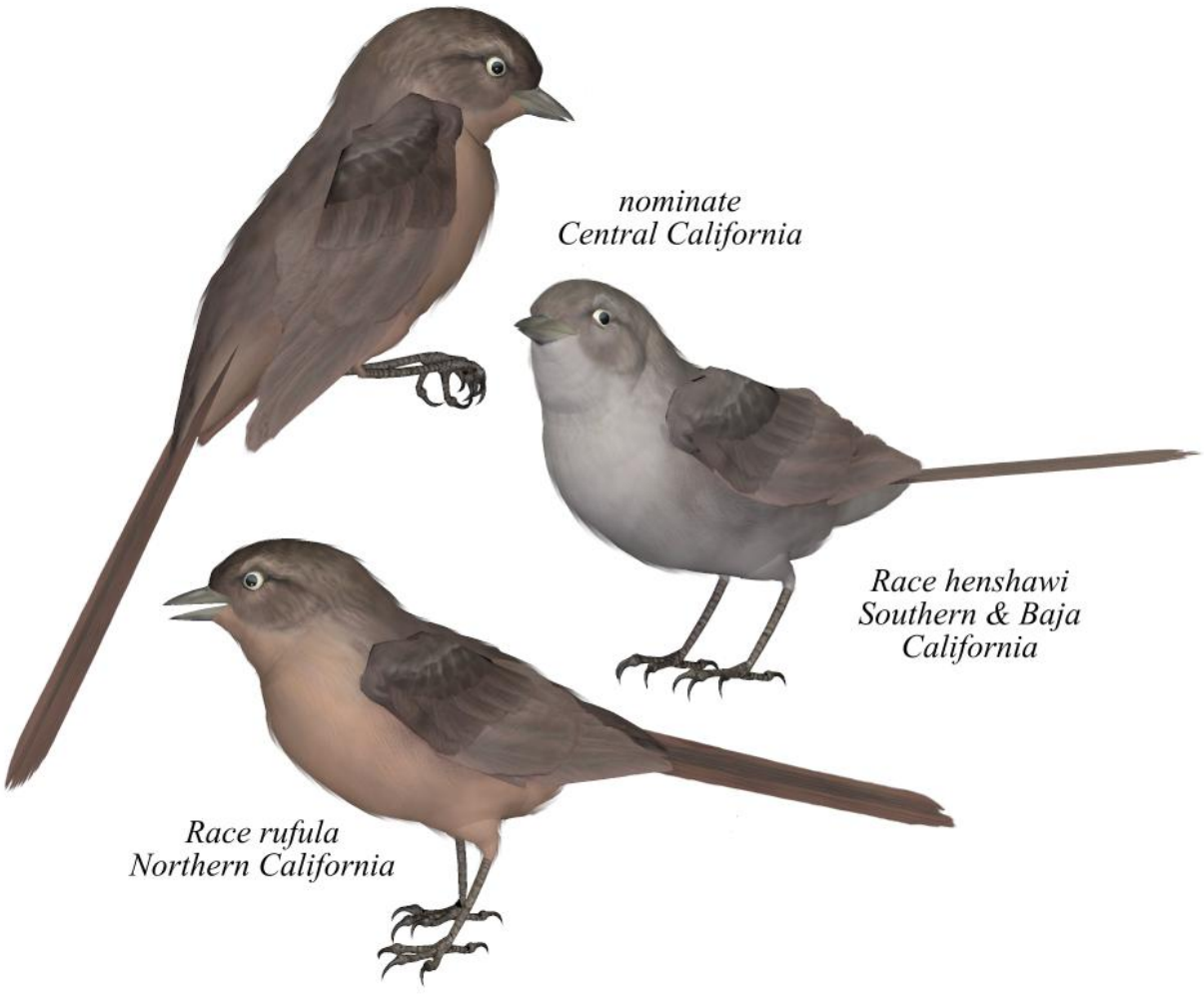
- *P. m. dimorphicus.* First reported by van Rossem and Hachisuka in 1938. A resident in mountains of southern United States (extreme southwest New Mexico and west and central Texas) and north-central Mexico (eastern Sonora east to northwest Coahuila, south to northeast Sinaloa and extreme northern Durango). The ventrum is washed with buff; the auriculars wholly or partly black; the crown gray and the dorsum is olive-brown.
- *P. m. iulus.* First reported by Jouy in 1893. It is found in western and central Mexico from Durango southward to southern Jalisco (Nevada de Colima), western Michoacán and southern Querétaro, eastward to northeast San Luis Potosí and western Tamaulipas. The ventrum is washed with buff; the auriculars wholly or partly black; the crown gray and the dorsum olive-brown.
- *P. m. personatus.* First reported by Bonaparte in 1850. It is found in the mountains of central Mexico from central Michoacán east through the Valley of Mexico and southern Hidalgo to western Veracruz (including Cofre de Perote) and northeast Puebla. It is similar to *iulus*, but the dorsum is washed with cinnamon (less olive).
- *P. m. melanotis.* First reported by Hartlaub in 1844. It is found in Southern Mexico in Guerrero (Sierra Madre del Sur), Oaxaca and mountains of northern Chiapas (possibly also west coastally to southwest Jalisco), also highlands of southwest Guatemala (east to Chimaltenango). It is similar to *iulus,* but the ventrum is buff (not white) and the dorsum is olive-brown (less green).

Common Name: Wrentit
Scientific Name: *Chamaea fasciata*

Size: 5.9 inches (15 cm)

Habitat: North America; resident of a narrow strip of coastal habitat in the western coast of North America, being found from Oregon south to Baja California, the north state of the Baja California peninsula.

Found in coastal scrub and montane chaparral, forests with dense shrub understory.



Status: Least Concern. **Global Population:** Unknown amount of mature individuals. This species has had stable population trends however the continued urban development of coastal sage shrub habitats may cause drops in local populations.

Diet: Beetles, caterpillars, bugs, and ants, but also takes small berries and seeds. Gleans insects from twigs and bark.

Breeding: Sexes are alike. The Wrentit has a uniform dull olive, brown, or grayish plumage. It has short wings and a long tail often held high (hence the comparison to wrens). It has a short bill and a pale iris.

Wrentit pairs mate for life, and may be together for more than 12 years. Both sexes incubate and sing to defend the territory. The nest is a tidy open cup made of bark strips held together with insect silk, lined with soap plant or grass, placed in crotch of shrub branches. One to five Greenish blue eggs are laid.

Cool Facts: Wrentits along the coast and in the more humid areas of the north tend to be darker than individuals living in drier and more interior parts of the range.

The Wrentit has been variously placed in its own family, the *Chamaeidae*, or with the long-tailed tits (*Aegithalidae*), the true tits and chickadees (*Paridae*), the "Old World warblers" (*Sylviidae*), and with the "Old World babblers" (*Timaliidae*). The American Ornithologists' Union placed the Wrentit in the latter family, giving it the distinction of being the only babbler known from the New World. This was based on DNA-DNA hybridization studies, which are phenetic (grouped by all overall similarities).

Through DNA sequence analysis, it was subsequently discovered that the Wrentit was more closely allied to Sylvia warblers and some aberrant "babblers". They consequently must be placed in the Sylviidae family, together with the Wrentit and the parrotbills, which also turned out to be close relatives. Thus, the Wrentit is the only American species of the "true" or sylviid warblers. Peculiarly, the Dartford Warbler and close relatives like Marmora's Warbler bear an uncanny resemblance to the Wrentit; their ecology is quite similar indeed as all are birds of Mediterranean scrub. However, biogeography and the molecular data build a strong case for this similarity being a case of convergent evolution between birds that are close relatives but by far not as close as their appearance would suggest.

- *C. f. phaea*. First reported by Osgood in 1899. It is found in the extreme western United States from western Oregon (Columbia River) southward along the humid coastal belt to the California border. Its dorsum is sooty brown. The crown is fuscous and the ventrum is vinaceous-cinnamon. The tail length averages short.
- *C. f. margra.* First reported by Browning in 1992. Found in the interior of southern Oregon, United States. It is like *phaea*, but the dorsum more cinnamon-brown and the flanks are paler and more pinkish brown.
- *C. f. rufula.* First reported by Ridgway in 1903. Found in coastal northwestern California (United States) from Oregon border southward to the San

Francisco Bay area. It is like *phaea*, but more rufescent overall with the flanks being a rich tawny brown.

- *C. f. fasciata.* First reported by Gambel in 1845. The nominate species is found in coastal central California (United States) from western Monterey County southward to central San Luis Obispo County. It is similar to *rufula*, but paler overall, with the dorsum medium grayish brown and the ventrum pale buff-cinnamon. The tail averages long.
- *C. f. henshawi.* First reported by Ridgway in 1882. It is found in interior and coastal southern California (United States) and extreme northwestern Mexico (northwestern Baja California). It is like the nominate, but paler and grayer overall. The tail is of variable length.

Common Name: Bohemian Waxwing
Scientific Name: *Bombycilla garrulus*

Size: 6.3-8inches (16-21cm)

Habitat: North America, Europe and Asia; It breeds in coniferous forests throughout the most northern parts of Europe, Asia and western North America.

It breeds in open coniferous or mixed forests, especially taiga. It winters wherever fruits are found, including gardens, parklands, and cities.

Status: Least Concern. **Global Population:** Unknown amount of mature individuals. Populations are decreasing throughout its range.

Diet: Berries supplemented by insects (especially during the breeding season). They fly-catch for flying insects, glean insects from vegetation and pluck fruit while perched, sometimes hover briefly to snatch fruit. They swallow the fruit whole.

Breeding: It is larger, fatter and greyer than the Cedar Waxwing and has bright yellow, black or rusty orange color on its tail feather tips and a yellow, white, red or black stripe along the wing feathers. Under tail coverts are a deep rust color. Both beak and feet are dark and the brown eyes are set in a narrow black mask underlined with white.

The preferred nest location is usually high in a pine tree, but feeding opportunities determine the location chosen. Each bird or pair may have more than one nest in the same general area. The nests have an outer diameter of 15 cm to 18 cm and are lined with fine grass, moss, and down. On average, 4 to 6 eggs

are laid. The egg shells have a pale bluish color with a heavy sprinkling of blackish spots and some dark, irregular lines. Incubation is around 14 days and the young leave the nest about 13 to 15 days after hatching.

Cool Facts: The name "Bohemian" refers to the nomadic movements of winter flocks. It comes from the inhabitants of Bohemia, meaning those that live an unconventional lifestyle or like that of gypsies.

The Bohemian Waxwing does not hold breeding territories, probably because the fruits it eats are abundant, but available only for short periods. One consequence of this non-territorial lifestyle is that it has no true song. It does not need one to defend a territory.

The call is a pleasant ringing sound, similar to that of the Cedar Waxwing but lower-pitched.

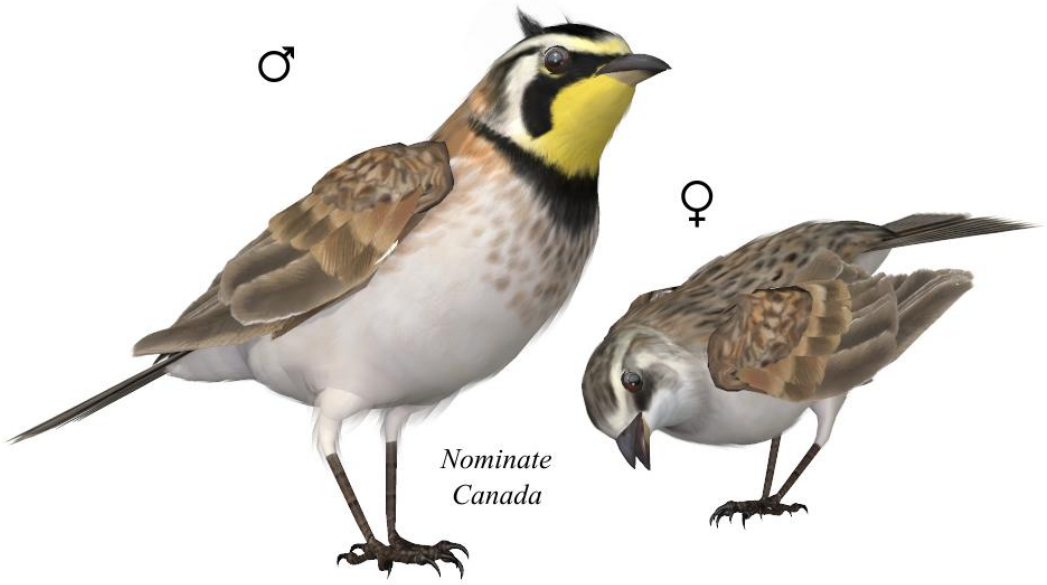
There are three weakly differentiated subspecies:.

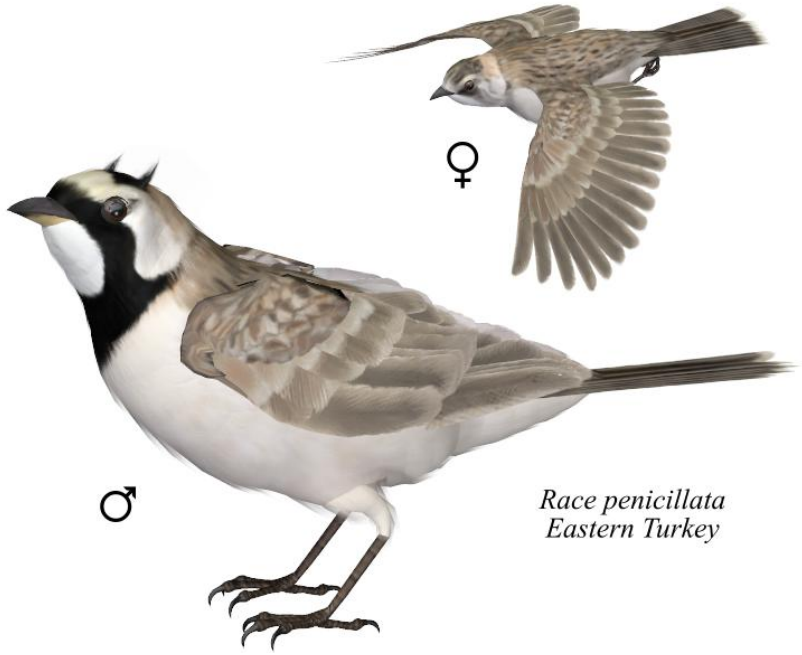
- *B. g. pallidiceps.* First reported by Reichenow in 1908. It breeds in the North American range. It is slightly less brightly colored than nominate, but with more cinnamon on forehead and malar region.
- *B. g. centralasiae.* First reported by Poljakov in 1915. It breeds in central (northern Ural Mountains. eastward) and eastern Siberia. It winters southward to northern China and Japan. It is an Accidental to western Alaska (western Aleutian and Pribilof Islands). It is described as the grayest race with the palest cheeks (in the malar region); compared with *pallidiceps*, it is paler dorsally and ventrally but often with darker under tail coverts. The forehead is pale grayish cinnamon, not contrasting strongly with rest of head;. The malar region is without cinnamon and the back is bright gray with a lilac tinge (vs. grayish brown to brown without a lilac tinge on *pallidiceps*). The flanks are washed pale gray (vs. dark gray).
- *B. g. garrulus.* First reported by Linnaeus in 1758. The nominate breeds across northern Europe eastward to western Siberia. It is the darkest and most brown, with most rufescent tones and least gray of the subspecies. It is described as only slightly darker than *centralasiae*, but some birds from these 2 regions similarly pale in summer and in winter as many as 50% of *centralasiae* indistinguishable from the nominate, making subspecific designation tenuous. Individuals from eastern part of range of *centralasiae* often as dark as the nominate.

Common Name: Horned or Shore Lark
Scientific Name: *Eremophila alpestris*

Size: 6.3-7.9 inches (16-20 cm)

Habitat: North America, Europe and Asia. It breeds across much of North America from the high Arctic south to the Isthmus of Tehuantepec. It is also found in northernmost Europe and Asia and in the mountains of southeast





Europe. An isolated population is found on a plateau in Colombia. It is mainly resident in the south of its range, with northern populations of this passerine bird being migratory and moving further south in winter.

This is a bird of open ground. In Eurasia it breeds in the far north and above the tree line in mountains. In much of Europe, during the winter, it is frequently seen on seashore flats, leading to the European name of Shore Lark. In the UK and in eastern England it can be found as it makes a winter stopover along the coasts. In America, where there are no other larks to compete with, it is also found on farmland, prairies, deserts, golf courses, airports, and the like.

Status: Least Concern. **Global Population:** 140,000,000 individuals worldwide, but this bird is declining in most of its range. National population sizes have been estimated at c.100-10,000 breeding pairs. In China- c.50-1,000 individuals on migration and c.50-1,000 wintering individuals. In Japan- < c.1,000 individuals on migration and < c.1,000 wintering individuals. This bird is declining in most of its range.

In the open areas of western North America, Horned Larks are among the bird species most often killed by wind turbines.

Diet: Adult Horned Larks eat primarily weed and grass seeds, but they feed insects to their young.

Breeding: Unlike most other larks, this is a distinctive-looking species on the ground, mainly brown-grey above and pale below, with a striking black and yellow face pattern. The summer male has black "horns", which give this species its American name. America has a number of races distinguished by the face pattern and back color of males, especially in summer. The southern European mountain race. *Eremophila alpestris penicillata* is grayer above, and the yellow of the face pattern is replaced with white.

The nest is on the ground, with 2-5 eggs being laid. It may be built near corn or soybeans for a source of food, and the female chooses the site.

Cool Facts: In England, this bird is called a “Shore Lark” and in France, “Alouette hausse”. In North America, the “Horned Lark” is the only true lark native to North America.

The use of mowed areas around airstrips has allowed the Horned Lark to colonize regions where no other suitable habitat may exist nearby, such as heavily forested areas.

Subspecies based primarily on differences in plumage coloration and size. Migratory populations tend to be larger, darker, and relatively longer-winged than

resident ones, while subspecies in mesic habitats also tend to be larger than those in arid habitats.

Atlas Group

- *E. a. atlas.* It is found in Morocco (Atlas Mountains). It is similar but paler than *flava.*

Black-necklaced Group

- *E. a. balcanica.* It is found in southeastern Europe (southern Balkans and Greece). *Balcanica* has yellow on face and throat, dark-streaked gray upperparts.
- *E. a. kumerloevei.* It is found in western and central Asia minor. *Kumerloevi* resembles *penicillata* but with unstreaked grayish-pink upper parts.
- *E. a. bicornis*. It is found in Lebanon and northern Israel–southern Syria border (Mt Hermon). *Bicornis* has pale areas on head even whiter than *kumerloevei*, crown to rump uniform plain sandy buff, tail-coverts tinged cinnamon.
- *E. a. penicillata*. It is found in eastern Turkey and Caucasus eastward to northen and western Iran. It has paler yellowish-white on head, pink hindneck, pink-tinged grayish-buff upperparts with fine streaks on mantle and scapulars.
- *E. a. albigula.* It is found in southwestern Turkmenistan and northeastern Iran eastward to western Tien Shan and southward to northwestern Pakistan. *Albigula* has pale parts of head white , gray central crown and hindneck, finely streaked sandy gray upperparts.

Tibetan Group

- *E. a. longirostris.* It is found in the Himalayas from northeastern Pakistan and Kashmir eastward to Sikkim. *Longirostris* is slightly darker than *albigula*, with black of cheekband and chest separated by white lower neck side.
- *E. a. teleschowi.* It is found in Central and Eastern Kunlun Shan from southern Xinjiang eastward to northwestern Qinghai and southward to northern Xizang (western China). It is pale with black (not white or yellow) forehead.
- *E. a. khamensis*. It is found in south-central China (southeastern Xizang, western Sichuan).
- *E. a. przewalskii.* It is found in the Qaidam Basin, in northern Qinghai.
- *E. a. nigrifrons*. It is found in the mountains of northeastern Qinghai.
- *E. a. argalea.* It is found in northern Ladakh, extreme western China (western Kunlun Shan) and western Tibetan Plateau.
- *E. a. elwesi.* It is found in the southern and eastern Tibetan Plateau.

Brandt's Group

- *E. a. brandti.* It is found in southeastern European Russia (lower River Volga) and northern Transcaspia eastward to northeastern China (Inner Mongolia), southward to northern Turkmenistan, Tien Shan and Mongolia; Northern

populations migrate southward. *Brandti* is to *flava* but has pale areas on head whitish (not yellow).

Shore Group

- *E. a. flava.* It is found in northern Eurasia eastward to northeastern Russia (Anadyrland), southward to southern Norway, Lake Baikal and northwestern Amurland. It winters in western and central Europe eastward to Kazakhstan, Mongolia and central China. In Eurasia, *flava* is very like American nominate (but with lesser coverts paler, less deep red).

Eastern Dark Group

- *E. a. hoyti*. A migratory race which breeds from n. Baffin Island. to northern Alberta and east to western Ontario; winters from Nevada to Michigan. Pale yellow throat, white eyebrow stripe.
- *E. a. alpestris.* The nominate race, breeds from western Ontario eastward to Newfoundland and Labrador. Almost completely migratory, it winters from Manitoba and Newfoundland south to Kansas and North Carolina, mixing with the resident *praticola* . It has a sepia brown dorsum, spectrum yellow, throat, and eyebrow stripe, and white belly.
- *E. a. praticola.* The “prairie” race, breeds from Minnesota to Nova Scotia and southward to eastern Kansas and North Carolina. In winter, some individuals move as far south as Florida. Smaller and darker than *arcticola*, but chin pale yellow to white.
- *E. a. giraudi.* A resident in coastal prairie from western Louisiana to Tamaulipas, Mexico, is smaller than *praticola,* back less blackish and more ochraceous, eyebrow stripe and throat pale yellow.
- .

Western Pale Group

- *E. a. arcticola*. It is completely migratory, breeds in Alaska and the Yukon south to mountains of British Columbia; in winter, moves south to occupy interior of British Columbia and n. California to Wyoming. It is largest of western subspecies, has a white throat and eyebrow stripe, pale neutral gray dorsum streaked with fuscous, pinkish buff nape and wrist.
- *E. a. alpina.* Arctic-alpine summits of northwestern United States (Mt. Rainier and Mt. St. Helens). *Alpina* is smaller and less brownish than *arcticola* with a darker back and more pinkish nape, upper tail-coverts, and upper wing coverts.
- *E. a. leucolaema.* It breeds from southern Alberta to extreme western Minnesota southward to central Colorado and eastward New Mexico; winter range extends to southern Texas and Sonora, Mexico. It is similar in appearance to *enthymia* but more ochraceous above.
- *E. a. enthymia.* It occupies much of the Great Plains from Saskatchewan and Manitoba to panhandles of Oklahoma and Texas; range extends southward in winter. Smaller than *arcticola*, upper surface paler, throat usually yellow.

- *E. a. merrilli.* The darkest subspecies, breeds in inter-mountain valleys from British Columbia tonorthern. California. Winters in southern part of its breeding range. Back blackish brown, nape and wrist army brown; medium sized, with yellow throat and pale yellow eyebrow stripe.
- *E. a. lamprochroma.* It breeds from lowlands of eastern Washington to northern California and eastward to Nevada; range extends southward to southern California and Arizona in winter. Back dark grayish brown, throat and eyebrow stripe white.
- *E. a. utahensis.* It is medium sized, lighter colored than *lamprochroma*; breeds from central Utah to central Nevada and north to Idaho. It has a yellowish throat and eyebrow stripe, dusky brown back, and drab nape.
- *E. a. ammophila*. It breeds in the Mojave and Amargosa deserts, with winter range extensions to northern Sonora. The dorsal coloration is sepia, midway between *actia* and *leucansiptila*; similar in size.
- *E. a. leucansiptila.* The palest North American race, has a pale yellow throat and eyebrow stripe; a resident from southeastern California to northwestern Sonora.
- *E. a. occidentalis*. Found in the southwestern United States (southern California and southwestern Nevada eastward to central New Mexico) and northwestern Mexico (northern Baja California and northwestern Sonora). Darker brown than *leucolaema,* more fuscous, and lacks grayish appearance of its neighbors; eyebrow stripe and throat pale yellow.
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Western Rufous Group

- *E. a. strigata.* It is small, dorsal surface dark brown, underparts yellowish, nape walnut brown, eyebrow stripe and throat yellow. Breeds along coast from s. British Columbia to Oregon, with some eastward range extension in winter.
- *E. a. sierrae.* It is is confined to a small area in ne. California along the Nevada border. Larger than *utahensis*, with a yellow throat and russet back.
- *E. a. rubea.* Found in northeastern and central California. It differs from *actia* and *strigata* only in more ruddy dorsal coloring.
- E. a. actia. A resident in the coastal range and San Joaquin Valley to northern Baja California. It is less ruddy than *rubea*, back sepia with more contrast between nape and back.
- *E. a. insularis.* Channel Islands, off southwestern California. It is darker above with no yellow on underparts.
- *E. a. adusta.* Southern Arizona eastward to southern New Mexico southward in Mexico to Durango and eastward to Coahuila. It resembles *occidentalis* but is much smaller; upper surface more reddish, vinaceous cinnamon; eyebrow stripe and throat yellow.

South Baja Group

- *E. a. enertera.* It is resident in west-central Baja California. It is smaller and lighter colored than *actia* and grayer than *leucansiptila* .

Mexican Group

- *E. a. aphrasta.* Found in northwestern Mexico (Chihuahua and Durango)
- *E. a. lactea.* Found in northeastern Mexico (Coahuila)
- *E. a. diaphora.* Found in northeastern Mexico (southeastern Coahuila to southern Tamaulipas, Hidalgo and northeastern Puebla)
- *E. a. chrysolaema.* Found on the southern Mexican Plateau (Jalisco to Michoacán, Puebla and Veracruz)
- *E. a. oaxacae.* Found in southern Mexico (eastern Oaxaca).

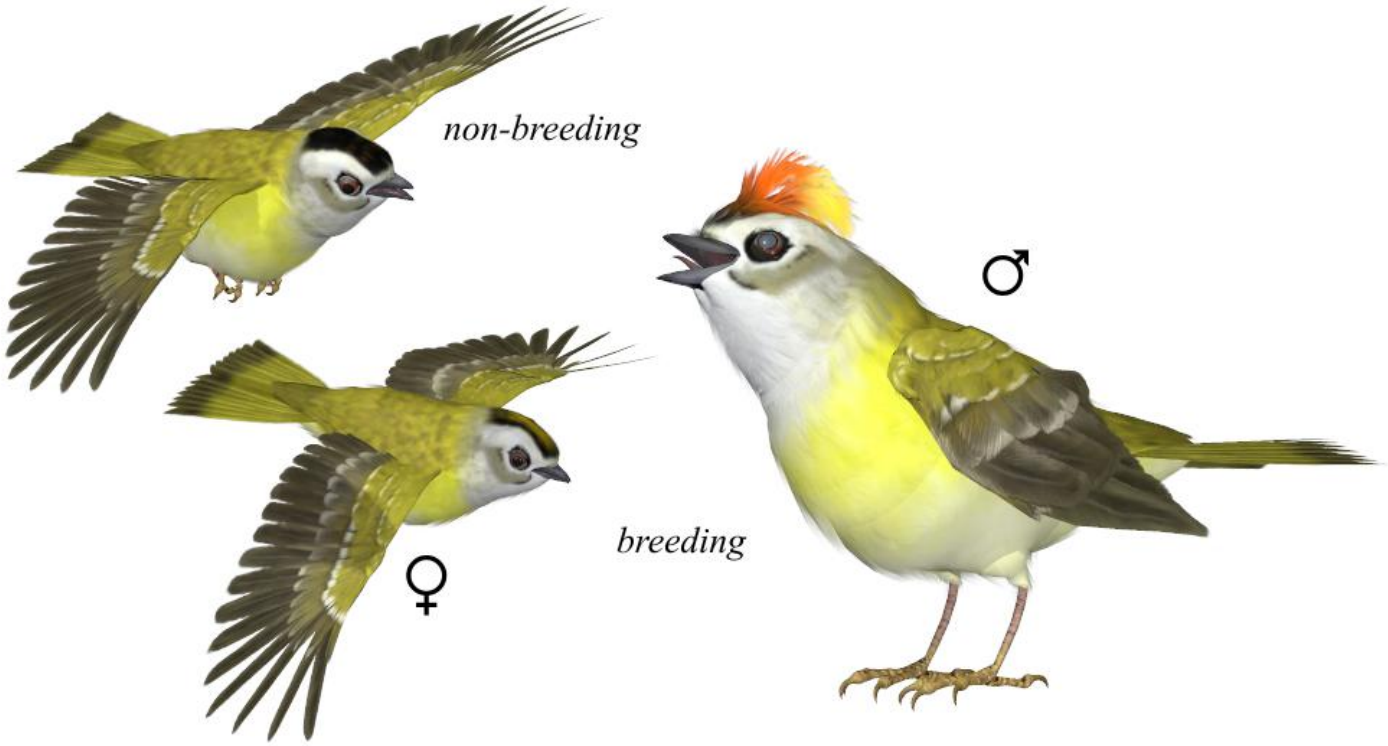
Colombian Group

- *E. a. peregrina.* Found in the eastern Andes of Colombia (Altiplano Cundiboyacense, North of Bogotá). It is is similar to *insularis* but much smaller, with the dorsum dark brown streaked with ochraceous, the wings and central rectrices fuscous, the eyebrow stripe and the throat pale yellow

Common Name: Taiwan Firecrest or Flamecrest
Scientific Name: *Regulus goodfellowi*

Size: 3.6 inches (9 cm)

Habitat: Asia; endemic to the mountains of the island of Taiwan.



It usually inhabits evergreen trees in coniferous forests over 2,000 m above sea level, though it is commonest above 2,500 m and ranges upward to 3,700 m. Mountains it inhabits include Alishan, Tayuling, Hehuanshan, Yu Shan, and the higher areas of Anmashan. They prefer conifers in which to forage, and are usually found in the forest canopy, but will sometimes venture into lower vegetation.

Status: Vulnerable. **Global Population:** Unknown amount of mature individuals. Restricted-range species: present in Taiwan EBA. Common. Mountain forests inhabited by this species are in large part protected as reserves . Because of its globally highly restricted breeding area, it may perhaps merit reconsideration with regard to its conservation status; possibly better regarded as Vulnerable.

Diet: Feeds primarily on insects, their larvae and eggs. They will occasionally consume seeds and berries. Firecrests are active and restless birds, hopping and fluttering about in the canopy. These lively songbirds are mainly solitary but

will move around actively in small, loose flocks of their own species as well as Coal Tits and Eurasian Nuthatches. The flight is weak and whirring.

Breeding: The most distinguishing characteristic is the orange-yellow crest on top of the male's head, for which this bird is named. When excited the male erects this crest. In females the top of the head is pure yellow with black crown stripes, while in males the top of the head is yellow with an orange center with the black crown stripes. White feathers encircle the black eye-patches, giving it the appearance of having two black eyes. The supercilium is very broad and the lores and forehead are whitish. There is a narrow, short black malar stripe. The chin is whitish and the throat, ear-coverts and sides of neck are grey. The mantle is green while the rump and flanks are yellow. The Centre of the belly is buff. The wings have broad white covert tips forming a wing bar. The tarsi are pinkish. Their breeding biology lacks significant research. It is assumed they have breeding habitats similar to kinglets.

Kinglet nests are small, very neat cups, almost spherical in shape, made of moss and lichen held together with spider webs and hung from twigs near the end of a high branch of a conifer. They are lined with hair and feathers, and a few feathers are placed over the opening. These characteristics provide good insulation against the cold environment. The female lays 7 to 12 eggs, which are white or pale buff, some having fine dark brown spots. Because the nest is small, they are stacked in layers. The female incubates; she pushes her legs (which are well supplied with blood vessels, hence warm) down among the eggs. The eggs hatch after 15 to 17 days. The young stay in the nest for 19 to 24 days. After being fed, nestlings make their way down to the bottom of the nest, pushing their still-hungry siblings up to be fed in their turn (but also to be cold).

Cool Facts: The Taiwan Firecrest is only 9 cm (3.6 in) in length and 7 grams in weight, making it is the smallest of all Taiwan's endemic bird species. Its plumage is the most vibrant in its family. It is also known as the Taiwan Flamecrest, Firecrest Kinglet, Formosan Fire and the Formosan Goldcrest.

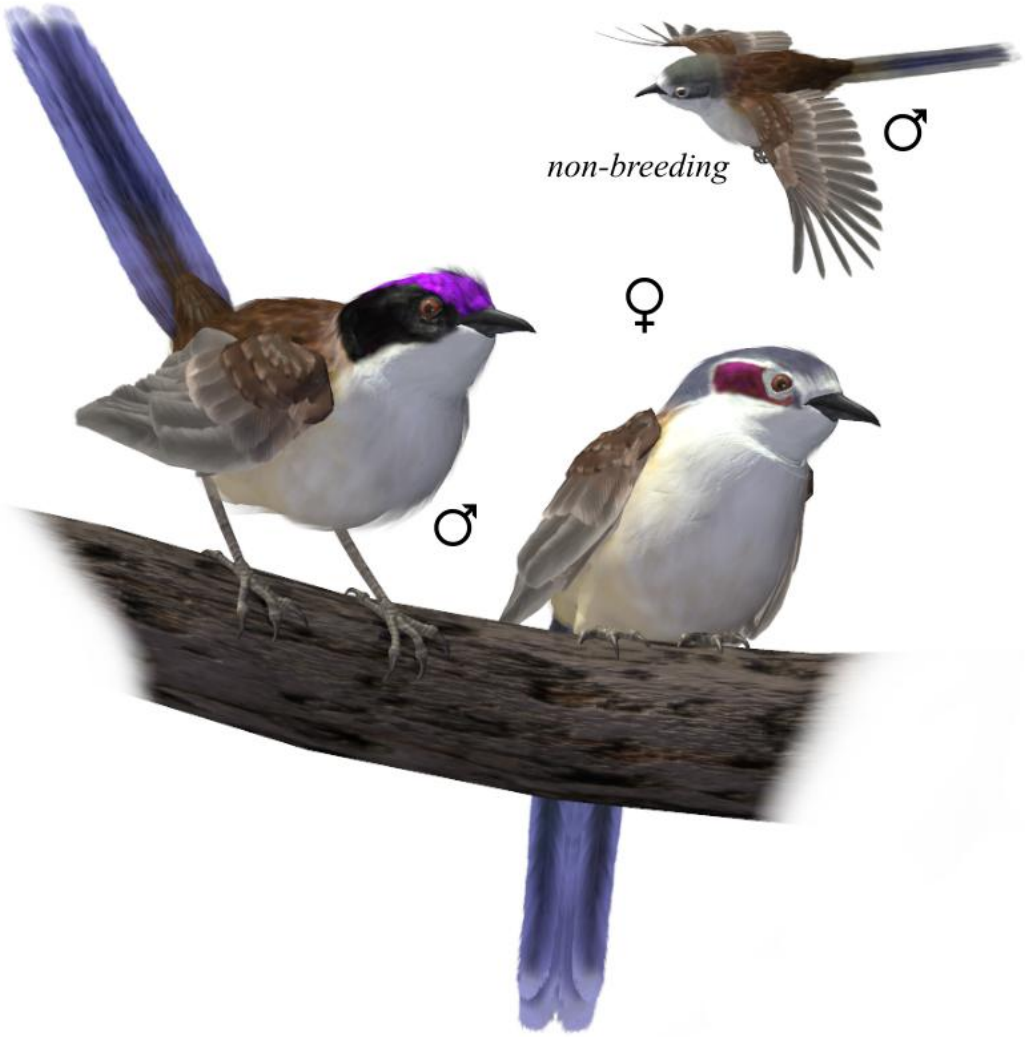
They have a high pitched see-see-see call and the song consists of a series of high notes

Common Name: Purple-crowned Fairy-wren
Scientific Name: *Malurus coronatus*

Size: 5 ½ inches (14 cm)

Habitat: Australia; Purple-crowned Fairy-wrens are divided into two races: the Eastern race (*M. c. macgillivaryi*) that occurs in the sub-coastal region from the Roper River in the Northern Territory to the Flinders River in Queensland; and the Western race (*M. c. coronatus*) that occurs throughout the Kimberley region of Western Australia and the Northern Territory. The two races of Purple-crowned Fairy-wrens never mix and more than 400 km separates them geographically.

Status: Least Concern to Vulnerable **Global population:** 6,700-19,000 mature individuals. Purple-crowned Fairy-wren populations have declined dramatically since they were first discovered 130 years ago and their battle for survival just keeps getting harder.. Livestock eat and trample the species habitat, seeking access to water. Fires are increasing in frequency since the advent of



pastoralism, and have been detrimental in some places. These processes expose soil, leading to erosion and, ultimately, denudation and weed invasion of river banks which are then abandoned by the species. This has been ameliorated along some parts of the Victoria River where several large pastoral stations have excluded stock from riparian areas.

Optus is joining forces with Australian Wildlife Conservancy to help protect the Purple-crowned Fairy-wren at Mornington Wildlife Sanctuary for future generations of Australians.

Diet: Insects (including beetles, ants, bugs, wasps, grasshoppers, moths and flies), their larvae, and spiders, which they find in the natural compost that accumulates in the leaf-axils of Pandanus after flooding. They mostly forage for their food on the shaded ground beneath clumps of Pandanus. Individuals forage separately, hopping rapidly over the ground. They always maintain contact with group members by means of ‘chet’ calls. The next most used foraging site is amongst the leaves of the Pandanus itself, over and through which the birds progress remarkably quickly, using their large feet to grasp the blades of the leaves.

Breeding: The plumage is brown overall, the wings more greyish brown. The bill and feet are dark pink to black. The male in breeding plumage has a purple crown bordered by a black nape and face. On the top of the head is a black rectangular patch. It also has a cream-buff belly and blue tail tipped with white. In eclipse plumage the crown is grey and head mottled black and grey. The female differs in having a blue-tinged grey crown, chestnut ear-coverts, and greenish blue tail. Immature birds have a brown crown, although male birds start to show black feathers on the face by 6 to 9 months.

Purple-crowned Fairy-wrens usually occur in family groups of 5 to 6 birds, comprising a socially monogamous breeding pair and their progeny from previous years. All birds help at the nest to raise the young of the dominant pair – a mating system known as cooperative breeding. Young Fairy-wrens and especially males tend to remain with their parents and help to raise their siblings after reaching maturity. Some helpers may assist their parents for up to four years or more before departing their natal territory and forming a breeding pair. Breeding activity takes place through the year but may not occur at all during very dry years. Only female Purple-crowned Fairy-wrens build the nest and incubate the clutch of 2 – 3 eggs. The male will keep her company and may even feed her while she builds. The nest itself is dome shaped, averaging about 40cm high, and is built close to the ground in thickets of pandanus, river grass or canegrass. Nests are made from rootlets, grass stems, leaves and bark. The nestlings remain in the nest for 10 days. They are barely able to fly when they first leave the nest so they remain in dense cover for about a week.

Cool Facts: Fairy-wrens use song to communicate in many different ways, from romancing their mates to warning other family members of dangers like an approaching predator. Male and female fairy-wrens even sing co-ordinated duets to ward off itinerant fairy-wrens from their territory.

The surgeon J. R. Elsey was the first to collect the species, on A. C. Gregory's northern Australian expedition in 1855 and 1856. Two specimens were collected at Victoria River and a third at Robinson River, but they were not examined for over 100 years. It was first described by the ornithologist John Gould in 1858. Its species name is derived from the Latin cŏrōna "crown". The nominate subspecies is found in the Kimberley region of northwestern Australia, while the subspecies macgillivrayi, named by Gregory Mathews in 1913, is from the lands bordering the Gulf of Carpentaria. The two subspecies are separated by around 200 km of land inhospitable to them, and have been so for around 10,000 years. Its distinctive plumage led Mathews to place it in a separate genus *Rosina*. However, genetic evidence shows it is most closely related to the Superb and Splendid Fairywren within the genus *Malurus*.

There are two subspecies:

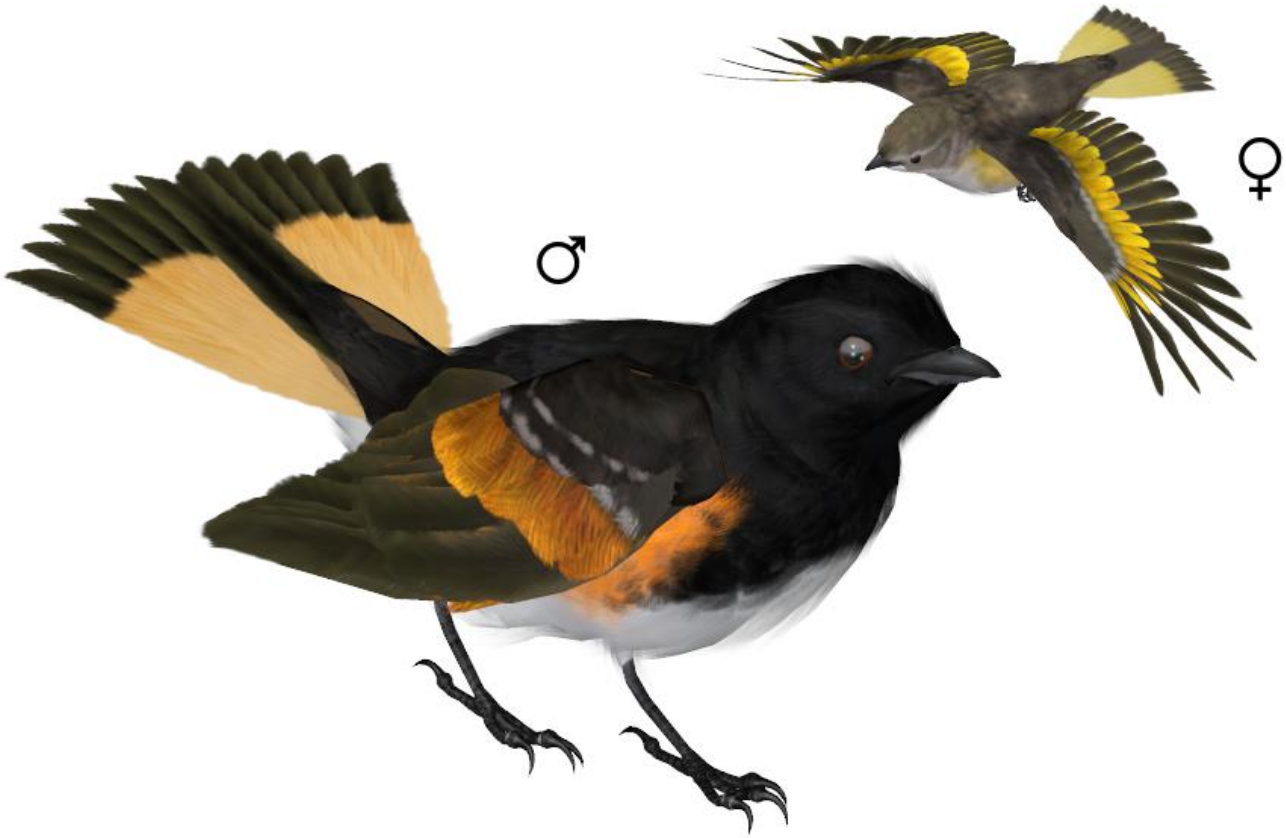
- *M. c. macgillivaryi. The* Eastern race occurs in the sub-coastal region from the Roper River in the Northern Territory to the Flinders River in Queensland.
- *M. c. coronatus.* The nominate, known as the Western race, occurs throughout the Kimberley region of Western Australia and the Northern Territory.

Common Name: American Redstart
Scientific Name: *Setophaga ruticilla*

Size: 4.3-5.1 inches (11-13cm)

Habitat: North and South America; throughout Canada, the United States (except the Pacific Northwest), Mexico, the Yucatan Peninsula and Northern South America. These birds are migratory, wintering in Central America, the West Indies, and northern South America (in Venezuela they are called "candelitas"). They are very rare vagrants to Western Europe.

Found in moist second growth deciduous forest, with abundant shrubs.



Status: Not Threatened. **Global Population:** 25,000,000 mature individuals. This species has undergone a small or statistically insignificant decrease over the last 40 years in North America.

Diet: Mostly insects; also some small fruits. Gleans insects from leaves, trunks, and branches. Also hawks insects in the air. Actively fans its tail and wings to elicit movement by prey. Also turns body back and forth to flush insects.

Breeding: Adult males have black hoods, backs, wings, tails, and chests. They have white bellies with orange on sides of breast. There are orange patches in wings and sides of base of tail. Females have light gray heads and gray to light green backs with whitish bellies. Yellow patches are found on sides of breast and yellow patches in wing and outer tail feathers. They have a faint, broken white eye ring. Immature birds look like adult females, though the immature males have a darker tail and may have irregular patches of black on head, breast, or back.

The male American Redstart occasionally is polygynous, having two mates at the same time. Unlike many other polygynous species of birds that have two females nesting in the same territory, the redstart holds two separate territories up to 500 m (1,640 ft) apart. The male starts to attract a second female after the first has completed her clutch and is incubating the eggs. The nest is a tightly woven open cup fitted into the branches or forks of trees or shrubs. 1 to 5 cream white eggs with dark speckles around large end are laid.

Cool Facts: The American Redstart is not particularly closely related to the Painted Redstart and the other redstart warblers of the Neotropics. They all are similarly patterned and forage in similar ways, flashing their tails and wings to startle insect prey. In other parts of the world other unrelated species of birds look and act similarly, such as the fantails of Australia and southeastern Asia.

Common Name: Song Sparrow
Scientific Name: Melospiza melodia

Size: 4.7-6.7 inches (12-17cm)

Habitat: North America; the range is continuous from the Aleutians to the eastern United States. There's also an isolated population that lives on the plateau of central Mexico, about 900 miles from the next closest population.

Song sparrows are found in a large variety of open habitats, including tidal marshes, arctic grasslands, desert scrub, pinyon pine forests, aspen parklands, prairie shelterbelts, Pacific rain forest, chaparral, agricultural fields, overgrown pastures, freshwater marsh and lake edges, forest edges, and suburbs. You may also find Song Sparrows in deciduous or mixed woodlands.

Status: Least concern. **Global Population:** 54,000,000 mature individuals. Widespread and common across most of North America. Song Sparrows have vanished from two islands off Southern California, the result of more frequent fires and introduced hares altering the sparrows' habitat. Wetland losses in the San Francisco Bay area have meant declining populations of a saltmarsh race of the Song Sparrow in that area.

Diet: Seeds and fruits, supplemented by many kinds of invertebrates in summer. Prey include weevils, leaf beetles, ground beetles, caterpillars, dragonflies, grasshoppers, midges, craneflies, spiders, snails, and earthworms. Plant foods include buckwheat, ragweed, clover, sunflower, wheat, rice, blackberries, blueberries, strawberries, raspberries, mulberries, and wild cherries. Food types vary greatly depending on what's common across the Song Sparrow's extensive

range. In British Columbia, Song Sparrows have even been observed picking at the droppings of Glaucous-winged Gulls.

Song Sparrows walk or hop on the ground and flit or hop through branches, grass, and weeds. Song Sparrows stay low and forage secretively. In fall, juvenile Song Sparrows may band together in loose flocks around berry trees or water sources. Flight is direct and low on broad, rounded wings. Often flies only short distances between perches or to cover, characteristically pumping the tail downward as it flies.

Breeding: Song Sparrows of different areas can look surprisingly different. The Song Sparrows of the Desert Southwest are pale, while those in the Pacific Northwest are dark and heavily streaked. Song Sparrows of Alaska's Aleutian Islands chain are even darker, and they're huge: one-third longer than the eastern birds, and weighing twice as much. The populations in Mexico have white throats and chests with black streaks.

Males come to exposed perches, including limbs of small trees, to sing. Courting birds fly together, fluttering their wings, with tails cocked up and legs dangling. Song Sparrows are primarily monogamous, but up to 20 percent of all Song Sparrows sire young with multiple mates each breeding season. Song Sparrow pairs search for nest sites together. Nest sites are usually hidden in grasses or weeds, sometimes placed on the ground and occasionally as high as 15 feet; often near water. Not afraid of human habitation, Song Sparrows may nest close to houses, in flower beds.

The female builds the nest, working mainly during the morning. It's a simple, sturdy cup made of loose grasses, weeds, and bark on the outsides, then lined more tidily with grasses, rootlets, and animal hair. Construction takes about 4 days. The finished nest is 4-8 inches across (2-2.5 inches for the inside of the cup), and 2.5-4 inches deep.

Cool Facts: Some scientists think that Song Sparrows of wet, coastal areas have darker plumage as a defense against feather mites and other decay agents that thrive in humid climates. The darker plumage contains more of a pigment called melanin, which makes feathers tougher and harder to degrade than lighter, unpigmented feathers.

Song Sparrows seem to have a clear idea of what makes a good nest. Field researchers working for many years on the same parcels of land have noticed that some choice spots – the base of a rose bush, or a particular hollow under a hummock of grass, for example – get used over and over again, even when entirely new birds take over the territory.

Despite the large differences in size and coloration across the Song Sparrow's range, genetic divergence is low. High rates of immigration and emigration may

keep populations genetically similar, while local selective conditions maintain the physical differences.

Like many other songbirds, the male Song Sparrow uses its song to attract mates as well as defend its territory. Laboratory studies have shown that the female Song Sparrow is attracted not just to the song itself, but to how well it reflects the ability of the male to learn. Males that used more learned components in their songs and that better matched their song tutors (the adult bird they learned their songs from) were preferred.

The Song Sparrow, like most other North American breeding birds, uses increasing day length as a cue for when to come into breeding condition. But, other cues can be important too, such as local temperature and food abundance. A study found that male Song Sparrows from the coast of Washington state came into breeding condition two months earlier than Song Sparrows in the nearby mountains, where the daylight changes were the same, but temperatures were cooler and trees budded out two months later.

Song Sparrows normally only lay one clutch of eggs per breeding season; however, in exceptional circumstances, such as loss of clutches from predation or an excess of resources, Song Sparrows have been recorded laying as many as seven clutches in a single breeding season and successfully rearing up to four clutches.

There are 25 subspecies of song sparrow:

Great Basin To Eastern North America (Includes 3 subspecies that are small, relatively brown, long-winged, and black-streaked)

- *M. m. melodia.* First reported by Wilson in 1810. The nominate subspecies is distributed as a breeder throughout eastern part of range, except parts of mid-Atlantic Coast, west through the Great Plains and Prairie Provinces; winters in southeastern United States south to Florida. Characterized by white underparts with well-defined black streaking, reddish-brown dorsal streaking on brown background with buff-gray fringes to feathers, short bill, and long wings.
- *M. m. atlantica.* First reported by Todd in 1924. A resident in salt marshes along middle Atlantic Coast from Long Island, New York, southward to southern limit of range. Similar to M. m. melodia but distinctly gray dorsally.
- *M. m. montana.* First reported by Henshaw in 1884. It breeds throughout Rocky Mountains and Great Basin regions from southeastern Washington eastward to north-central Montana southward to eastern California, and eastward to northern. New Mexico. Many individuals resident, but northernmost birds migrate southward to northeastern Baja California and Sonora in winter. It is similar to the nominate, but grayer and larger overall, with more slender bill.

Alaska And Pacific Northwest (Includes 9 subspecies that are large, dark, and diffusely streaked)

- *M. m. maxima.* First reported by Gabrielson and Lincoln in 1951 . A resident in Alaska in western Aleutians (Attu Islan. to Atka Island). It is the largest subspecies; roughly the size of California Towhee. It is characterized by long, diffuse streaking on gray ground color (contrast weak), gray dorsal background color, and a long, slender bill.
- *M. m. sanaka.* First reported by McGregor in 1901. A resident in Alaska from the eastern Aleutian Islands (Seguam Island to Unimak Island, including Amak Island), the Alaska Peninsula eastward to Stepovak Bay, and islands south of Alaska Peninsula (Sanak Island to the Semidi Islands. It is similar to *maxima* but grayer overall with more slender bill. The birds on the Semidi Islands average even grayer.
- *M. m. insignis.* First reported by Baird in 1869. An Alaska resident on Kodiak Island. (Barren Island to Sitkalidak Island) and Alaska Peninsula at Kukak and Katmai; many migrate south in winter. It is medium-sized and darker than *sanaka*, and paler and grayer than *kenaiensis* .
- *M. m. kenaiensis.* First reported by Ridgway in 1900. A resident on the Pacific Coast of the Kenai Peninsula and islands in Prince William Sound; partly migratory. It is similar to both *insignis* and *caurina*, but smaller and browner than former and larger than latter.
- *M. m. caurina.* First reported by Ridgway in 1899. A resident on the coast of the northern portion of the Gulf of Alaska; many winter in Pacific Northwest. It is smaller than *kenaiensis*, grayer and longer-billed than *rufina* .
- *M. m. rufina.* First reported by Bonaparte in 1850. A resident on the outer islands of Alexander Archipelago, southeastern Alaska, and on Queen Charlotte Islands, British Columbia; some birds move south in winter. It is darker and more rufescent than *caurina*, but sootier than *morphna*.
- *M. m. morphna.* First reported by Oberholser in 1899.It is mainly a resident coastally from central-western and southwestern British Columbia southward west of Cascades to northwestern Oregon. It is similar to *rufina* but more rufescent throughout.
- *M. m. merrilli.* First reported by Brewster in 1896. It is partly resident from central-eastern British Columbia southward through eastern Washington to northeastern California and northern Nevada; some winter farther southward. It is similar to *morphna*, but paler, grayer, with more well-defined, contrasting streaks.
- *M. m. cleonensis.* First reported by McGregor in 1899. A resident west of Cascades in southwestern Oregon and northwestern California. Intermediate between *morphna* and *gouldii* (below), dark brown dorsally with chestnut streaks, streaked chestnut ventrally with streaks somewhat diffuse, and flanks washed with buff.

Cismontane California (Includes 6 subspecies that are small, relatively gray, short-winged, and black-streaked)

- *M. m. gouldii.* First reported by Baird, 1858. A resident in central coastal California, except on San Francisco Bay. It is a deep reddish brown with prominent black streaking; streaks on breast and back lack rufous or ruddy halo, unlike *heermanni*, *melodia,* and *montana*; mantle feathers black-centered with uniform olive-yellow edges, lacking fringe of silver-gray (unlike *graminea*) or brownish gray with intervening brownish region (unlike *heermanni*).
- *M. m. samuelis.* First reported by Baird in 1858, A resident in California in salt marshes skirting northern San Francisco Bay and in San Pablo Bay. Dorsal background olive-dusky with black-streaked underparts; small overall with small bill.
- *M. m. maxillaris.* First reported by Grinnell in 1909. It is a resident in California in brackish marshes of Suisun Bay. Rich dark brown dorsally with feathers edged gray-buff; base of bill swollen.
- *M. m. pusillula.* First reported by Ridgway in 1899. A resident in California in salt marshes skirting southern San Francisco Bay. It is the only subspecies with yellowish underparts. Yellowish gray dorsally and small overall.
- *M. m. heermanni.* First reported by Baird in 1858. It is largely resident in central and southwestern California (including Central Valley) and northwestern Baja California. Weak clinal variation from south to north involving reduced grayish fringes to mantle feathers and reduced brown between black medial streak and fringe.
- *M. m. graminea.* First reported by Townsend in 1890. A resident on California Channel Islands. (San Clemente, San Miguel, Santa Cruz, Santa Rosa, Anacapa) and Islands Los Coronados, Baja California. It was formerly abundant on Santa Barbara Island but now extirpated. The birds on Santa Cruz Island. generally intermediate between *graminea* and *heermanni* of adjacent coast, with many specimens indistinguishable. Thus, birds on Santa Cruz best treated as making up a hybrid population, not assignable to subspecies. Birds of Islands Los Coronados (“coronatorum”), San Miguel Island (“micronyx”), and other Channel Islands (“clementae”) were named on basis of slight mean differences in bill and leg length, hallux length, and overall size, respectively, but populations are not diagnosable.

Desert Southwest And Northwestern Mexico (Includes 3 subspecies that are small, pale, and rufous-streaked)

- *M. m. fallax.* First reported by Baird in 1854. A resident in the Sonoran Desert southward to Gulf of California, parts of the Mojave Desert northward to southern Nevada and southwestern Utah, and eastward to eastern Arizona.
- *M. m. fasciata.* First reported by Bryant in 1888. A resident in central Baja California, where allopatric from other subspecies. It is pale; in plumage most closely resembles f*allax*, but has lightly streaked breast and long, slender bill.

- *M. m. goldmani.* First reported by Nelson in 1899. A resident in Durango, where known only from Sierra Madre Occidental in vicinity of El Salto. The dorsal background dark reddish brown with broad brown streaks that recall, surprisingly, *morphna* of Pacific Northwest.

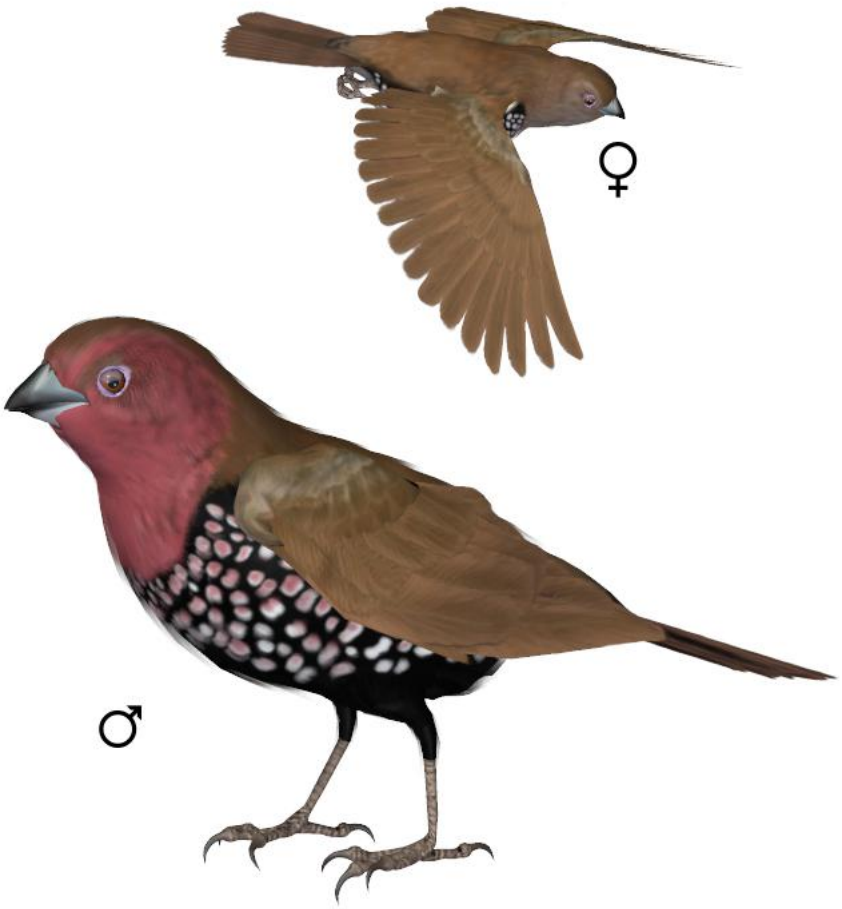
Mexican Plateau (Includes 3 subspecies that are black-spotted and white-throated)

- *M. m. adusta.* First reported by Nelson in 1899. A resident along the Río Lerma drainage in Michoacán from Zacapu to Lago Yuriria, Guanajuato. It is black-spotted below, with wide black dorsal streaks on reddish-brown background and clean white throat. Clinal variation within subspecies, with reddest, darkest birds in west and brownest birds in east.
- *M. m. villai.* First reported by Phillips and Dickerman in 1957 . It is a resident at head of Río Lerma, near Toluca, Mexico. It resembles *adusta* but is darker, lacking the reddish tones, and larger than other Mexican Plateau birds.
- *M. m. mexicana.* First reported by Ridgway in 1874. A resident from Hidalgo through Tlaxcala and México to Puebla. It is similar to *villai* but smaller and somewhat more pale. Some clinal variation within subspecies, with birds becoming paler and grayer from Hidalgo south through the Valley of México to Puebla.

Common Name: Pink-throated Twinspot
Scientific Name: Hypargos margaritatus

Size: 4.7- inches (12–13.5 cm)

Habitat: Africa; southeast African coast in southern Mozambique (south of River Save), northeastern South Africa (east Limpopo southward to northern KwaZulu-Natal) and eastern Swaziland.



It generally prefers dry woodland with dense undergrowth and thickets, sand forest, palm scrub, thorny cover along edge of riverine forest, and dense thorn-scrub.

Status: Least Concern to Near Threatened. **Global Population:** Unknown amount of mature individuals. While not threatened globally, the Twinspot is Near-threatened in South Africa and Swaziland, due to its small distribution range. Both habitat destruction and the cage-bird trade (an estimated 2000 birds are thought to be exported from Mozambique every year) are leading factors in its decline.

Diet: Small grass seeds; insects. Forages on ground . Generally in pairs or in small family groups; often with other waxbills. Inconspicuous.

Breeding: Male has crown to back brown, rump and upper tail--coverts dull reddish-pink, tail dark brown, edged pinkish, wing brown; face and sides of neck to upper breast pink, lower breast to under tail-coverts black, sides of breast and belly with large pinkish spots and white spots ; iris dark brown, eyering pale

pinkish-blue; bill blue-grey; legs grey. Female differs from male in having face to breast grey, centre of belly to undertail-coverts pale grey, sides of breast and belly black with large pinkish-white spots; eyering slightly duller. Juvenile is like female, but underparts entirely pale grey, bill black.

Both adults have distinctive white spots below the wings and chest. Males have pinkish throats, face and breasts with brown crowns. Females have grey-brown throats, breasts and bellies. Juveniles are brown above and pale grey below with no spots.

The nest is an untidy ball with a side entrance, made of dry grass or leaf ribs, skeletonized leaves, inflorescences and spider webs, that is lined with palm fibers and leaf litter. It is typically concealed in dense vegetation and leaf litter, less than one meter above ground. Only one clutch of three eggs has been recorded, laid in January, although it can lay up to four eggs in captivity.

Cool Facts: In Afrikaans, they are called “*Rooskeelkolpensie*”. The much rarer Pink-throated Twinspot is often mistaken for the Red-throated Twinspot (which has a crimson red marking in the male of the species).

Close contact call a soft rising "seesee" or "sisi"; distance call or alarm a short "zirr" or "rrrrreeee" or a long high "tseeeerrr". Song a trill ending with a buzzy phrase

Special Thanks to…

….my betatesters:

2012 Original Release: Jan, FlintHawk, Linda, Kat and Sandra
2020 Re-release: Alisa, FlintHawk and Carey

Species Accuracy and Reference Materials

The author-artist has tried to make these species as accurate to their real life counterparts as possible. With the use of one generic model to create dozens of unique bird species, some give and take is bound to occur. The texture maps were created in Painter with as much accuracy as possible. Photographic references from photographs from various Goggle searches and several field guides were used.

- **"The Sibley Guide to Birds"** by David Allen Sibley.
- **"A Guide to the Birds of Mexico and Northern Central America"** by Steve N. G. Howell and Sophie Webb
- **"Birds of South America. Non-Passerines: Rheas to Woodpeckers"** by Francisco Erize, Jorge R. Rodriguez Mata and Maurice Rumboll
- **"Birds of East Asia"** by Mark Brazil. Princeton University Press
- **"Birds of Southeast Asia"** by Craig Robson. Princeton University Press
- **"Birds of Australia"** by Ken Simpson and Nicolas Day. Princeton University Press
- **"Field Guide to the Birds of East Africa"** by Terry Stevenson and John Fanshawe

Field Guide Sources:

- **Cornell Lab of Ornithology** (http://www.birds.cornell.edu)
- **Wikipedia** (http://www.wikipedia.com)
- **Birdlife International** (http://www.birdlife.org)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