



Avian Models for 3D Applications

Original Songbird ReMix model by B.L. Render & Ken Gilliland

Revised Songbird ReMix model by Ken Gilliland

Songbird ReMix

3D Digital Bird Making Made Easy

Manual

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Opinions expressed on this booklet are solely that of the author, Ken Gilliland, and may or may not reflect the opinions of the publisher.

The “Original” **Songbird ReMix**

Manual & Field Guide

Introduction

Songbird ReMix is a unique universal bird model based originally on the DAZ Songbird model. By adding some additional geometry to correct the talons, adding transparency mapped feathers and revising the wing structure, the model has been “ReMixed” into a bird that can fold its’ wing and whose realism and accuracy had been greatly improved.

With an arsenal of morphs, conforming crests and the proper texture map, the base bird model can be transformed into almost type of songbird. Wrens, jays, thrushes, chickadees, pigeons and even a roadrunner are possible from the same universal model.

Songbird ReMix History (2002-2020)

The original model was created by Anton Kiesel who sold the rights to DAZ 3D. The Kiesel Model is now known as the “DAZ Songbird”. In 2002-3, the model was revised (or “ReMixed”) by B.L. Render who corrected the anatomy and added many features such as folding wings and character morphs. Her partner, Ken Gilliland, using the new morphs, created the bird species and textured them. This set was released at DAZ in February of 2003. There were two versions; a standalone version and an upgrade version which required the “DAZ Songbird” model. Also that year, “Songbird ReMix Characters” was released by Ken Gilliland and “Songbird ReMix Woodpeckers” by the B.L. Render/Gilliland partnership.

Ken Gilliland continued to release add-on sets such as “Threatened, Endangered, Extinct” and “Cool ‘n’ Unusual Birds”. He took control of the Songbird ReMix series and in 2006, feeling confident in his improved modeling skills, the model was again, “ReMixed” as “Songbird ReMix2”. The additions added more complex morphs and geometry to create more complex birds such as hummingbirds, quail and kingfishers. With the original and upgrade versions and now a second upgrade, confusion began to develop on what was required to make the series work. Two things happen to clear this confusion; DAZ decided that the Songbird ReMix model have moved far enough away from the “DAZ Songbird” model and would be considered a separate entity. This allowed Ken to drop the Original/Upgrade versions and turn the Songbird ReMix series into stand-alone products. In 2007, Gilliland created the first Songbird ReMix hybrid model, the wild turkey, followed in 2008 by a Toucan.

B. L. Render and Gilliland did reunite for one last partnership in 2008 with Songbird ReMix Vultures. Both worked on the new Vulture model and shaping morphs and Gilliland completed the product with his textures.

For the next few years, hybrid models such as seabirds and shorebirds were created. The series began to run against a wall of mediocrity, so Gilliland began to look at the base model once for ways to improve the series.

The Songbird ReMix model was remixed a third time in 2010, creating a much more realistic bird than the prior versions. It also began to move away from the SBRM2 “one size fits all” model approach into separate hybrid models. This allowed more exotic looking and realistic species to be created.

With Gilliland’s move from DAZ to the upstart company Hivewire3D in the summer of 2013, he started creating more realistic hybrid models of Waterfowl, Birds of Prey and a reworking of his Songbird ReMix Owl. Starting in 2016, physical renderers such as Iray and Superfly grew in popularity, so once again, Gilliland began to consider another “ReMix”. He started by updating his most current Hivewire3D products for physical renderers.

From 2018 to the present he’s been steadily updating the 1000+ birds in the Songbird ReMix library to the new SBRM4 format.

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.

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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.

Songbird ReMix Basics

The Songbird ReMix Project consists of one bird mesh that can be morphed and textured into hundreds of different bird species. The base model can be morphed into such species as the Greater Roadrunner, a House Sparrow and a wren. The model has built in morphs to allow accurate folding of the wings, flight and perching and had a low polygon count allow possible flock renders. The model has been used in the science fields to demonstrate courtship behavior, published depicting endangered and extinct status of bird species and is used by professional and amateur artists for commercial and private use. The model is in wavefront (.obj) format so it can be accessed by most of the affordable popular 3D packages such as Poser, DAZ Studio, Carrara and Vue as well as high-end packages as Max and Maya.

The Morphs

Most of these are fairly straightforward. Every morph or control is found within the main figure/BODY section. These controls are divided into three sections: Actions Controls, Corrective Controls and Creation Controls.

Action Controls, as expected, control pose oriented actions such as a wing folding, beak opening or eyes closing. These controls are categorized into folders with specific uses; the Tongue Movement folder controls Tongue poses while the Wing and Tail controls wing and tail movements. The “Fluff” controls allow a fluffier look to the bird.

Corrective Controls are used for specific issues such as a way to deal with issues that might arise from using a physical renderer as opposed to the standard renderer. It might also have corrections to smooth out the figure with weird joint parameter/morph issues that may arise. This section may be added to it future updates.

Creation Controls are the morphs and controls that shape the generic bird model into a specific bird species. There are a number premade bird shapes such as chickadee, jay, thrush, etc that provide an easy way to get to a specific bird shape, rather than working through the individual creation morph dials. Consider these “Specific Species Shapes” for what they are; a master dial to control a large variety of individual dials within the Creation Control folder. I do express

caution when “mixing” species shapes because sometimes adding individual morphs upon morphs can have negative results. It is better to use a single species shape and then add more individual morphs to it than to mix two or three species morphs together.

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):
 - **Perching Birds (Order Passeriformes)**
- **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.

Where to find your birds

Type Folder	Bird Species
Perching Birds (Order Passeriformes) Cardinals, Tanagers & their Allies	Northern Cardinals
Perching Birds (Order Passeriformes) Chickadees, Tits & their Allies	Black-capped & Mountain Chickadees
Perching Birds (Order Passeriformes) Crows, Jays and their Allies	Blue & Stellar's Jays
Perching Birds (Order Passeriformes) Finches, Old World Sparrows & their Allies	House Sparrows & Eurasian Bullfinches
Perching Birds (Order Passeriformes) Thrushes, Oxpeckers & their Allies	American Robins
Perching Birds (Order Passeriformes) Wrens, Nuthatches & their Allies	Bewick's, Eurasian & House Wren

Where to find your poses

Type Folder	For what species?
Perching Birds (Order Passeriformes) Poses can be found in "Universal Poses" & "type" folders	All Songbirds

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 every beak is a different, the "Beak Open-Close" control will vary on what closes the beak; it usually is anywhere from 0.7 to 1.1.
- The "Raise Upper Beak" control 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.

Creating Your Own Poses

While I won't waste time explaining the basics on how you create a pose in Poser or DAZ Studio, there is value in knowing what parts need to be saved on the Songbird ReMix model in order to create a successful pose file.

One of the most difficult things when saving a pose is to know what morphs should be saved and which ones shouldn't. The Songbird ReMix model makes this task easy. First, all morphs (save the **grasp/spread** ones in the foot parts) are all found within the main Figure/BODY section. They are divided into three parts; **Action Controls**, **Correction Controls** and **Creation Controls**. For the most part, when saving a pose you'll want to select everything from the **Action** and **Correction Controls** sections. **Creation Controls** specifically alter the actual species shape so normally would be used in a pose.

Apart from the Grasp and Spread controls in each foot, you'll want to save the X-Y-Z Rotate in every part. The Scaling or Trans information for each part is normally not saved. Also, the Main Figure/BODY part doesn't usually have any Rotate, Trans or Scale information saved; just the body morphs and controls.

To clean up your pose further, all the outlying "hidden" parts of the head are controlled via the BODY controls, so the actual parts can be deleted from the pose. These parts include: lEye, rEye, lUpperLid, lLowerLid, rUpperLid, rLowerLid, crest, beakfluff and beak.

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.

A good work around solution for artifacts is to HIDE Fluff areas (Correction Controls)

Songbird ReMix

Field Guide

BLUE JAY
STELLER'S JAY
BLACK-CAPPED CHICKADEE
MOUNTAIN CHICKADEE
BEWICK'S WREN
EURASIAN WREN
HOUSE WREN
AMERICAN ROBIN
NORTHERN CARDINAL
HOUSE SPARROW
EURASIAN BULLFINCH
BANK SWALLOW

Common Name: Blue Jay

Scientific Name: *Cyanocitta cristata*

Size: 10-12 inches (25-30 cm)

Habitat: North America; found east of the Rocky Mountains in the United States and Canada.

It prefers oak, deciduous and conifer forests and urban areas and is found more commonly at forest edges than deep in the interior.

Status: Least Concern. **Global Population:** 12,000,000 mature adults. Surveys show a significant decline in Blue Jay numbers across the United States, with most of the decline in the East. There has been a slow expansion of range westward. In the East, nest predation is a suspect, as well as urbanization of habitat and climate change. Spring heat waves endanger young birds in the nest. The estimated number of this species in 2003 was 22,000,000. Protected under the Migratory Bird Treaty of 1918 in the North America. Provisions of this treaty have been critically weakened during the 2016-2020 Trump Administration.



Diet: Omnivorous. Most of diet is vegetable matter (up to 75% of diet for year, higher percentage in winter), including acorns, beechnuts, and other nuts, many kinds of seeds, grain, berries, small fruits, sometimes cultivated fruits. Eats many insects, especially caterpillars, beetles, grasshoppers, and others; also eats

spiders, snails, birds' eggs, sometimes small rodents, frogs, baby birds, carrion, other items.

It readily drinks water when available by inserting bill, tilting the head back near a 45° angle, and swallowing. Sometimes it laps drops of water from vegetation.

Blue Jays lower their crests when they are feeding peacefully with family and flock members or tending to nestlings.

Breeding: Male and female look alike. The upperparts are various shades of blue with wings and tail boldly marked with black bars and white tips. The head is crested blue. The black bridle across the face, nape, and throat varies extensively and may help Blue Jays recognize one another. The underparts are grayish white with black U-shaped collar across upper breast and sides of neck joining black eye-line and black border around rear of head behind crest. The tail is fairly long and graduated. Juveniles are similar to adults, except the blue areas are slightly grayer, and the black areas are slightly browner.

Courtship may involve aerial chases; male may feed female. Blue Jays become quiet and inconspicuous around the nest, but will attack with loud calls if the nest is threatened by a predator.

They built nests of open cup of twigs, grass, and sometimes mud lined with rootlets. Nests usually have 2 to 7 eggs. The eggs are greenish or buff, sometimes pale blue, spotted with brown and gray. Incubation is by both parents (but female does more), about 16-18 days. Both parents bring food for nestlings. Young leave nest 17-21 days after hatching.

Cool Facts: There's a love/hate relationship with humans and Jays because their bold behavior. Most people believe jays are nest robbers, but in a recent study only 1% of jays were found to have eggs or nestlings in their stomachs.

It's common knowledge that Blue Jays migrate with thousands of them moving past some points along the Eastern coast, however not all Jays migrate and which do and don't is a mystery to ornithologists. Younger jays are more likely to migrate and while most adults do, some don't. Some skip migration one year then migrate the next.

Blue Jays are known to mimic the calls of hawks. It is believed that these calls provide information to other jays that a hawk is around, or that they are used to deceive other species into believing a hawk is present.

It is said the tool use is a sign of superior intelligence and while tool use in birds is rare, captive jays are known to have use them. They will take used strips of newspaper to rake in food fallen from outside of their cages. Besides jays, parrots, ravens and crows are known for tool use.

There are four subspecies of Blue Jay:

- *C. c. bromiai*. First reported by Oberholser in 1921. Largely resident from eastern-most British Columbia and central Alberta eastward to southern Quebec and Newfoundland and south through the Dakotas to northeastern Nebraska and central Missouri east through central Illinois and Indiana, northeastern Kentucky, northeastern Tennessee to south-central Virginia. They winter south casually to Oregon, southern Louisiana, central Alabama, northeastern Georgia, and east Texas and has reached California and Nevada. The dorsum is deep blue with white markings on the remiges and rectrices extensively, and relatively large. The dorsal color varies clinally, with the darkest blue birds in Newfoundland.
- *C. c. cristata*. First reported by Linnaeus in 1758. The nominate species is largely resident from southern Missouri eastward through south Illinois, southwestern Indiana, western Kentucky, Tennessee (except extreme northeast corner), and southwestern Virginia to North Carolina and southward from southeastern Texas along the Gulf Coast to north and central Florida. It is similar to *C. c. bromia*, but the dorsum is dull blue and washed purplish, white markings on the remiges and rectrices is reduced and smaller. As noted by Ridgway (1904) and later by Mengel (1965), there is a gradual transition between extremes among populations in eastern North America, with perhaps a greater difference between Florida and southeastern states than between the latter and the northeast.
- *C. c. semplei*. First reported by Todd in 1928. A resident in the southern half of the Florida peninsula, from Hillsborough and Osceola Cos. south across the mainland and presumably to the upper Keys, where it is scarce and was unknown until the 1970s. Much like *C. c. cristata* and perhaps best merged with it, but the ventrum is whiter (less gray on breast and flanks), the lower throat is less a bluish wash, and the dorsum is paler and duller blue (less purplish).
- *C. c. cyanotephra*. First reported by Sutton in 1935. Largely a resident from southeastern Wyoming and Nebraska (except northeast corner) southward through eastern Colorado, western Kansas, and Oklahoma to northern Texas. Like *C. c. bromia*, but the dorsum is duller and paler blue. It averages smaller in size.

Common Name: Steller's Jay
Scientific Name: *Cyanocitta stelleri*

Size: 12-13 inches (30-34 cm)

Habitat: North America; West of the Rockies in the United States, Mexico and Canada.

They are birds of coniferous and coniferous-deciduous forests. In the southwestern U.S. and Mexico they also live in arid pine-oak woodland. Typically, they are found at elevations of 3,000-10,000 feet, and lower down in the evergreen forests of the Pacific coastal foothills. During irruptive movements in some winters, flocks may move through unusual habitats such as Sonoran desert.

Status: Least Concern. **Global Population:** 9,890,000 mature adults. Populations have remained relatively stable, with a slight increasing trend. Protected under the Migratory Bird Treaty of 1918 in the North America. Provisions of this treaty have been critically weakened during the 2016-2020 Trump Administration.



Diet: Insects, seeds, berries, nuts, small animals, eggs, and nestlings. Around people, they also eat unguarded picnic items, from trash cans and feeders (peanuts, sunflower seeds, and suet).

With large nuts such as acorns and pinyon pine seeds, Steller's Jays carry several at a time in their mouth and throat, then bury them one by one as a winter food store. Steller's Jays are opportunists and will steal food from other birds or look for handouts from people. Steller's Jays move around with bold hops of their long legs, both on the ground and among the spoke-like main branches of conifers. They pause often to eye their surroundings, cocking their head with sudden movements this way and that.

Breeding: Male and female look alike. A large songbird with a large head, chunky body, rounded wings, and a long, full tail. The bill is long, straight, and powerful, with a slight hook. Steller's Jays have a prominent triangular crest that often stands nearly straight up from their head. The head is charcoal black and the body is all blue (lightest, almost sparkling, on the wings). White markings above the eye are fairly inconspicuous.

Both members of the pair choose the nest site, typically a conifer, and both gather nest material. Steller's Jays put their nests on horizontal branches close to the trunk and often near the top of the tree (though some nests are built much lower, even just above ground level). They built nests of twigs, sticks and sometimes mud, laying 1 to 6 eggs.

Cool Facts: Jays peck at food while holding with their feet. The only jays in the North and South America to build nests with mud are Steller's Jay and the Blue Jay.

The Steller's Jay shows a great deal of variation in appearance depending on its location. The black-crested form is found in southern Mexico. Younger birds are known to stray from their normal range.

Steller's and Blue jays are the only North American jays with crests. The Blue Jay is expanding its range westward. Where they meet, the two species occasionally interbreed and produce hybrids.

Scientists have described 16 subspecies of the Steller's Jay in North and Central America, showing varying combinations of black and blue on the crest, head, and body. The Queen Charlotte Islands off British Columbia are home to the largest and darkest race. In mainland North America, you can notice differences between darker Pacific forms, with blue streaks over the eye, and lighter Rocky Mountain forms with white streaks and a partial white eyering.

- *C. S. stelleri*. First reported by Gmelin in 1788. The nominate species is a resident from southern Alaska southwards to southwestern British Columbia. Also a resident coastally from southwestern British Columbia south to northwestern California. The crest is black. The head is dark blue-black (the darkest of any subspecies). The forehead has small, light blue streaks. The white eye-arcs are lacking. The throat is pale and streaked gray while the neck and mantle are dark blue-black, usually with no contrast to the head. The ventrum is deep, dark blue and the wing coverts are blue with faint

darker barring. The rectrices are indigo with narrow black barring, especially toward the tip.

- *C. s. carlottae*. First reported by Osgood in 1901. A resident on Haida Gwaii (Queen Charlotte Island), British Columbia. It appears like the nominate, but the crest, back, and mantle are blacker and the throat is more extensively more gray. The ventrum is paler (light blue to indigo), and the wings and tail are paler.
- *C. s. frontalis*. First reported by Ridgway in 1873. It is found from central Oregon south through the mountains of eastern California and west-central Nevada. It is similar to *C. s. annectens*, but the head is grayish black, the crest feathers are tipped blue, there are blue streaks on forehead extended posteriorly over the crown, and the dorsum is light sky blue.
- *C. s. annectens*. First reported by Baird in 1874. A resident in the northern Rocky Mountains. from eastern British Columbia and southwestern Alberta southward to northeastern Oregon, northern Idaho, western Montana, and northwestern Wyoming. It is similar to *C. s. stelleri*, but is somewhat paler overall so that there is greater contrast between the black-blue head and gray-blue dorsum, and the ventrum is light sky blue. There is also a silvery spot above the eye.
- *C. s. macrolopha*. First reported by Baird in 1854. A resident in the southern Rocky Mountains from Nevada eastward to western South Dakota and southward to northern Sonora and Chihuahua. It is similar to *C. s. annectens*, but the mark above the eye is bolder, whiter, and more extensive (extending to below the eye). Also, the gray throat patch is deeper (extending into upper breast), and the contrast sharper between the glossy black of the face and crest and the gray of the mantle.
- *C. s. diademata*. First reported by Bonaparte in 1851. It is found in the Sierra Madre Occidental of northwestern Mexico from southeastern Sonora and southwestern Chihuahua south to Durango and Jalisco; also on Cerro Potosí, Nuevo León and western Tamaulipas. It looks like *C. s. macrolopha*, but the forehead spots are whiter (less blue) and the dorsum grayer.
- *C. s. phillipsi*. First reported by Browning in 1993. A resident in northeastern Mexico in south-central San Luis Potosí. Like *C. s. coronata*, but the markings on the front of crest more extensive and paler, and both the dorsum and ventrum are duller. Intermediates with *C. s. coronata* occur where ranges meet.
- *C. s. coronata*. First reported by Swainson in 1827. A resident in the highlands of northeastern Mexico from southeastern San Luis Potosí southward to northern Veracruz and Puebla. The crest is bright blue and long; the front of the crest has pale purple marks. The white marks around the eye are limited. The cheeks are black, the throat ultramarine, the mantle grayish blue, the rump light blue, the wings and tail purplish blue and the ventrum is rich blue. Intermediates with *C. s. azteca* (below) occur to in northern Veracruz.
- *C. s. purpurea*. First reported by Aldrich, 1944. A Resident in w. Mexico, in mountains of n. and central Michoacán. Similar to *C. s. coronata*, but crest long and purplish blue, dorsum darker (blackish blue), throat gray, and

ventrum grayer and with a contrasting dark blue crissum. Hybridizes with *C. s. azteca* (above) in n.-central Michoacán.

- *C. s. azteca*. First reported by Ridgway in 1899. It is a resident in the mountains of central Mexico from Edo. México and Morelos eastward to Puebla and west central Veracruz. Similar to *C. s. coronata*, but crest black (the only subspecies in the southern group without a blue crest), throat black (not blue), dorsum purplish blue, and white marks above and below eye more extensive. This taxon is surrounded by blue-crested subspecies, with which it hybridized where geographic ranges meet.
- *C. s. teotepecensis*. First reported by Moore in 1954. A resident in the mountains of southern Guerrero. Similar to *C. s. purpurea*, but the lower cheek and throat are blue, the breast is light blue, and the dorsum is blue-gray.
- *C. s. restricta*. First reported by Phillips in 1966. Resident in mountains of Oaxaca. It is similar to *C. s. teotepecensis*, but crest short, both the dorsum and ventrum light blue, and the throat grayish whitish.
- *C. s. ridgwayi*. First reported by Miller and Griscom in 1925. A resident in the highlands of north Middle America south of the Isthmus of Tehuantepec, from Chiapas south to northern Guatemala. Similar to *C. s. restricta*, but darker blue overall with bluer (less white) streaks on crest.
- *C. s. lazula*. First reported by van Rossem in 1928. A resident in the highlands of El Salvador. It is like *C. s. ridgwayi*, but “darker and more purely blue” (Browning 1993), including on the throat. Birds in adjacent Honduras are intermediate toward *C. s. sauvis* (below).
- *C. s. sauvis*. First reported by Miller and Griscom in 1925. A resident in the highlands of northern Nicaragua. Like *C. s. lazula*, but the crest and dorsum are more ultramarine blue and upper throat is gray. The bill averages deeper as well.

Common Name: Black-capped Chickadee

Scientific Name: *Poecile atricapillus*

Size: 5-6 inches (12.3-14.6 cm)

Habitat: North America; throughout northern North America.

Preferred habitat is deciduous and mixed deciduous/coniferous woodland, open woods and parks, willow thickets, and cottonwood groves. Also prefers disturbed areas, such as old fields or suburban areas, where suitable nest sites are available with sufficient foliage to support adequate food for dependent offspring. It is generally more common near edges of wooded areas, but can be found even in the middle of large wooded tracts.

Status: Least Concern. **Global Population:** 15,000,000 mature adults. Forest fragmentation had no effect on chickadee body condition in winter across different levels of forest cover, but did increase risk taking behavior. Chickadees prefer to move through continuous forest and avoid crossing gaps. Forest fragmentation can constrain movements.

In Colorado, Chickadee abundance was negatively related to distance to houses in a suburban environment, suggesting they are a human-sensitive species. Chickadees were significantly more abundant in undeveloped compared to both high and low density (of homes) developed landscapes. In Washington, urban development also had a negative effect on chickadee abundance. Chickadees can breed successfully (though at lower densities) in suburban landscapes where natural snags are available, and winter survivorship is similar between suburban and food supplemented forest habitat in



Pennsylvania. Chickadees are protected under the Migratory Bird Treaty of 1918 in the United States. Provisions of this treaty have been critically weakened during the 2016-2020 Trump Administration.

Diet: In the winter, the diet is about 50% animal (mostly insects and spiders) and 50% plant (primarily seeds and berries). During breeding season, the diet changes to 80–90% animal (largely caterpillars), the rest seeds and fruits.

Individuals hop on trees or (less frequently) on the ground while foraging. They rarely “walk” along twigs or branches while hanging upside-down. They can also creep along more-or-less vertical trunks while foraging. The flight is slightly undulating with rapid wing beats and most flights are less than 15 m long.

Breeding: Sexes are generally alike in plumage but males slightly longer than females in wing and tail, and slightly heavier in body mass.

This chickadee has a solid black cap and bib, white cheeks, an unstreaked greenish-gray back, buffy flanks and crissum, dark grayish wings and tail. The bill is black, the legs and toes are bluish gray and the iris is dark brown. The wings are rounded with 10 primaries and the tail is long. Within the sexes, adult wings are longer than those of younger birds (and average lengths vary with subspecies). Juveniles essentially the same as adults in overall plumage pattern, but plumage is somewhat looser in texture.

They built nests of coarse materials lined with soft materials and lay 6 to 8 reddish finely speckled white eggs.

Cool Facts: The beloved Black-Capped Chickadee is probably the most reproduced artistically songbird in the world.

It hides seeds and other food items for later recovery. Each item is placed in a different spot and it can remember thousands of hiding places.

While the chickadee's calls may sound simple, they are really very complex and language-like. Their calls provide information on identity and recognition of other flocks as well as predator alarms and contact calls.

Breeding pairs and non-breeders join up into flocks outside of the breeding season. Non-breeders may be members of several flocks, with a different position in the dominance hierarchy of each flock.

There are seven subspecies:

- *P. a. bartletti*. First reported by Aldrich and Nutt in 1939. A resident in Newfoundland and Miquelon Island. It is similar to *P. a. atricapillus* but the upper parts and flanks are dark gray, the mantle is tinged brown, and the white edges to remiges are less extensive. Presumably as a result of

geographic isolation, this subspecies is the only subspecies whose DNA differs.

- *P. a. atricapillus*. First reported by Linnaeus in 1766. The nominate species is a resident from southeastern Manitoba eastward through central Quebec to Maritime Provinces and south to east-central Kansas and west-central Missouri to central Ohio, central Pennsylvania, and n. New Jersey and south along Appalachian Mountains. to western North Carolina . In the winter, it sometimes wanders south to the Mid-Atlantic region. The upper parts are moderately dark, even gray with the white edges to remiges (wing coverts and tail feathers) being moderately extensive. The flanks are deep buff. There are some clinal variation in color, with western populations being slight paler, especially on the flanks. Size large (male wing = 60.0–68.6 mm), but tail short (58.0–66.0 mm).
- *P. a. septentrionalis*. First reported by Harris in 1845. A resident from the southern Yukon and through most of British Columbia (except the southwestern corner) eastward to central Manitoba and southward, east of the Cascades and excluding the Great Basin and Rocky Mountains, to southern Oregon, central Idaho, northern Montana, and southward, east of the Rocky Mountains, to central Colorado and central Kansas. It occasionally wanders southward in winter, with records to northern Arizona and the Oklahoma panhandle. It is similar to *P. a. atricapillus* in size and plumage, but the tail is longer (63.0–72.5 mm), the upper parts are paler gray, and the white edges to remiges are more extensive. The wings averages longer as well.
- *P. a. garrinus*. First reported by Behle in 1951. A resident through the Rocky Mountains from central and east Idaho and south-central Montana southward to southeastern Utah and northern New Mexico. It is similar to *P. a. septentrionalis* but the rump is buff, the contrasting mantle is brownish gray, and the flanks are paler and pinker.
- *P. a. nevadensis*. First reported by Linsdale in 1938. A resident in the Great Basin from southeastern Oregon and southwestern Idaho southward to northeastern Nevada and north-central Utah . Similar to *P. a. garrinus* but lacks the brown and buff tones (i.e., coloration purer gray).
- *P. a. occidentalis*. First reported by Baird in 1858. A resident on the Pacific slope from southwestern British Columbia to northwestern California. The darkest, brownest, and smallest subspecies (male wing = 57.5–65.0 mm, tail 53.5–60.5 mm).
- *P. a. turneri*. First reported by Ridgway in 1884. Resident in southern and central Alaska. Vagrants recorded to Pt. Barrow and Nunivak Island. The palest of the subspecies: it is like *P. a. septentrionalis* but the mantle is paler still and flanks are pale buff or white. The tail averages shorter (61.5–67.0 mm).

Common Name: Mountain Chickadee

Scientific Name: *Poecile gambeli*

Size: 5-6 inches (12-14 cm) **Wingspan:** 7.5 inches (19 cm)

Habitat: North America; range extends from the southern Yukon to California and Rocky Mountain States in the United States. A few mountain chickadees may migrate locally up the mountains in the summer and down into the mountain foothills in the winter.

Preferred habitat is in conifer forests. The similar Black-capped Chickadee often occurs along streams and in broad-leaved trees, while Mountain Chickadees stick to the evergreens on higher slopes. They will seek food and water in the lowlands on dry years.

Status: Least Concern. **Global Population:** 4,360,000 mature adults with a decreasing trend. Mountain Chickadee populations declined by over 1.5% per year between 1966 and 2014, resulting in a cumulative loss of 53%, according to the North American Breeding Bird Survey. Partners in Flight estimates a global breeding population of 7.5 million with 80% living in the U.S., 19% in Canada, and 1% in Mexico. Protected under the Migratory Bird Treaty of 1918 in the United States. Provisions of this treaty have been critically weakened during the 2016-2020 Trump Administration.



Diet: Primary diet is insects during the summer and breeding season. Conifer seeds and other plant seeds are taken throughout the year. Energetic models

suggest that a half-ounce chickadee needs to eat about 10 calories per day to survive. That's equivalent to about one-twentieth of an ounce of peanut butter.

They cling to the undersides of branches and to tree trunks, searching for food in the bark or breaking seeds open by hammering them with their beaks. Mountain Chickadees hide their food, as do other chickadees. It often hides seeds and caught insects under bark, in pine needle clusters, and in the ground.

As summer draws to a close, Mountain Chickadees band together into groups of up to three pairs of adults plus a variety of young birds. These juveniles have spent some time after fledging traveling in their own groups, but by September they typically join a group of adults and remain in that flock for the winter. In late winter, pairs begin to break away from foraging flocks to inspect possible nest sites. At feeders, chickadees have a distinct pecking order, with males typically forcing females aside except early in the breeding season. On cold, sunny mornings, Mountain Chickadees catch a little extra warmth by "sunbathing" on an exposed perch out of the wind. Unlike some other species, Mountain Chickadees typically brave the cold winter nights alone, huddled in foliage clumps or under big flakes of bark.

Breeding: Male and female look alike. Adults of both sexes have a black cap joining a black postocular stripe behind distinctive white eyebrows. Their backs and flanks are gray and they have paler gray underparts. They have a short black bill and a black bib.

They breed monogamously, producing 1 to 2 broods per year. They built nest of coarse materials lined with soft materials such as fur. Mountain Chickadee warm and hide their eggs when the female is not in the nest by covering the unincubated eggs with fur. The female lays up to 7 eggs. Incubation by the female and lasts 14 days. The young are altricial, and stay in the nest for 21 days while being fed by both parents.

Young Mountain Chickadees leave their home territories about three weeks. They settle in new territories by late summer and remain in that spot all their lives.

Cool Facts: The evergreen forests of the Western mountains periodically suffer massive outbreaks of tree-killing insects such as bark beetles and needle miners. When this happens, it's all-you-can-eat for Mountain Chickadees. During a lodgepole needle miner outbreak in Arizona, one chickadee was found with 275 of the tiny caterpillars in its stomach at one time.

Subspecies:

- *P. g. gambeli*. First reported by Ridgway in 1886. A resident of the southern Rocky Mountains. from southeastern Idaho and central Montana southward to southeastern Arizona and southwestern Texas. The nominate species back is brownish, the sides and flanks are cinnamon buff and the bill is short and blunt.

- *P. g. inyoensis*. First reported by Grinnell in 1918. It is found in the Great Basin from southern Idaho and southeastern Oregon southward through east.-central California, Nevada, and Utah; casual non-breeding movement to lower elevations of southeastern Arizona. The back and flanks are light buff. It has a long, narrow bill. Behle (1956) distinguished most of Utah and southern Idaho populations as *P. g. wasatchensis*, which he said were closest to *inyoensis*, but with a darker back (greener, less grayish pink) and a slightly longer tail; these were made synonyms under *inyoensis* by Snow (1967) but merged under nominate *gambeli* by Phillips (1986).
- *P. g. abbreviatus*. First reported by Grinnell in 1918. Found in the southern Yukon Territory southward through British Columbia, the interior mountains of Washington and Oregon, eastward to the eastern slopes of Rocky Mountains, central Idaho, northwestern Nevada southward into California through higher Coast Ranges (to Lake County) and Sierra Nevada to Piute Mountains. (Kern County), where intergrades with *P. g. baileyae* (see below). It is grayer overall than *P. g. inyoensis* on the back and flanks, some in fresh plumage as buff but not as pale. The bill is intermediate and the tail is short. Coloration darkens from Oregon to southern British Columbia, becoming grayish green; these were named *P. g. grinnelli* (a name synonymized here following Snow 1967 and Phillips 1986, which combined all, *abbreviatus* and *grinnelli*, under *baileyae*) .
- *P. g. baileyae*. First reported by Grinnell in 1908. It is discontinuously distributed in mountains of southern California and disjunctly in Santa Lucia Mountains, Monterey County and has been found to the south in lowlands of northern Baja California. It is darker on the back and the flanks are gray. The bill is heavy and long. The tail is long.
- *P. g. atratus*. First reported by Grinnell and Swarth in 1926. Found in the mountains of northern Baja California. It has a broken and narrower white supercilium is the most obvious character differing from adjacent *P. g. baileyae*. It has a darker coloration, being more leaden gray above (less brown) compared with *P. g. baileyae*. The bill of the male is slightly shorter and wider than that of *P. g. baileyae*.

Common Name: Bewick's Wren

Scientific Name: *Thryomanes bewickii*

Size: 5.1 to 5.25 inches (13-14 cm)

Habitat: North America; its range is from southern British Columbia, Nebraska, southern Ontario, and southwestern Pennsylvania south to Mexico, Arkansas and the northern Gulf States.

Found in brushy areas, scrub and thickets in open country, riparian woodland, chaparral, urban and suburban parks, and residential areas.

Status: Least concern. **Global Population:** 8,690,000 mature adults. Bewick's Wren populations declined by about 39% between 1966 and 2015, according to the North American Breeding Bird Survey. Partners in Flight estimates the global breeding population at 5.6 million, with 71% spending part of the year in the U.S., 30% in Mexico, and 1% in

Canada. The severe declines of Bewick's Wren in the eastern United States coincided with range expansion in the House Wren. It is suspected that the House Wren, which frequently removes eggs from nests in cavities, was directly responsible for the decline. The increased



availability of nest boxes may have helped the spread of the House Wren, and therefore the decline of the Bewick's Wren.

Wrens are protected under the Migratory Bird Treaty of 1918 in the United States.

Diet: Eggs, larvae, pupae, and adults of insects and other small invertebrates. Common prey animals include bugs, beetles, bees and wasps, caterpillars, butterflies, moths, grasshoppers, crickets, flies, and spiders. Bewick's Wrens also occasionally eat seeds, fruit, and other plant matter, especially in winter. Bewick's Wren nestlings receive mostly caterpillars, spiders, grasshoppers, and

insect pupae. Adults sometimes consume pebbles and mud, perhaps for nutrients or to help with the grinding digestion of their food..

Bewick's Wrens cock their long tails up over their backs, often flicking their tails from side to side or fanning them as they skulk through tangles of branches and leaves searching for insects. During breeding season, males sing vigorously from prominent perches.

Breeding: Male and female look alike. They are subdued brown-and-gray wrens with a long, brow-like white stripe over the eye. The back and wings are plain brown; the underparts are gray-white; and the long tail is barred with black and tipped with white spots.

Courting Bewick's Wrens normally form monogamous pairs. While they're setting up house and even after the female has begun incubating eggs, the male and female often forage together. This may help the male prevent his partner from mating with another bird. Bewick's Wrens usually build their nests in cavities or on ledges within 30 feet of the ground. Males often begin the process, with the female contributing equally by the end. Common sites include rock crevices and ledges, brush piles, abandoned woodpecker nest cavities, outbuildings, nest boxes, and abandoned automobiles. The female usually lays 5–7 eggs that are white with brown spots.

A young male Bewick's Wren learns to sing from neighboring adult males while he is coming of age in his parents' territory. The songs he develops differ from his father's, with a note changed here, a syllable there. The melodious signature he acquires between the ages of about 30 and 60 days will be his for life.

Cool Facts: While similar in appearance to the Carolina Wren, it has a long tail that is tipped in white. The song is loud and melodious, much like the song of other wrens.

John James Audubon is credited with having first described the wren, collecting the first known specimen in 1821. The Bewick's Wren is named after Audubon's friend Thomas Bewick, an English engraver and natural historian.

A list of commonly recognized subspecies follows. Two have gone extinct during the 20th century, mainly due to habitat destruction and cat predation:

- *T. b. bewickii*. First reported by John James Audubon in 1827. The nominate species is found in the midwestern USA from northeastern Kansas and southern Iowa east through south Ontario and central Ohio to central Pennsylvania and south to northern Arkansas east through northern Alabama to central South Carolina. Winters in the southern portion of breeding range and occasionally south to Florida and Louisiana. The species is extirpated or nearly so from Appalachia and hence that population has been proposed for listing as an endangered under the U. S. Endangered Species Act. Reddest of the subspecies: dorsum is a deep reddish brown, perhaps dusker in

Appalachia, but type series of "*T. b. altus*" is soiled and hence that population may not be truly darker; central rectrices reddish brown, distinctly barred; flanks washed rufous; body size smaller (wing < 57 mm, tail < 56 mm).

- *T. b. pulichi*. First reported by Phillips in 1986. Largely resident in southern Great Plains of across most of Kansas, Oklahoma, and, presumably, north-central Texas, perhaps extending east into western Missouri. Some winter south to south-central Texas and perhaps to northern Tamaulipas or even southeastern Coahuila. Appears similar to the nominate species, but dorsum is paler and less reddish brown and the bill is shorter.
- *T. b. cryptus*. First reported by Oberholser in 1898. Its range is Central Kansas to northern Tamaulipas in Mexico. Appears similar to the nominate species, but dorsum is duller; central rectrices are brown and the body size is larger (wing > 55 mm, tail > 55 mm).
- *T. b. sadai*. First reported by Phillips in 1986. Resident on Gulf slope from southernmost Texas to central Tamaulipas. Looks like *T. b. cryptus* but is smaller (wing < 55 mm, tail < 55 mm) and dorsum is grayer still; the flanks generally lack the rufous tones; ventrum is whitish.
- *T. b. eremophilus*. First reported by Oberholser in 1898. It is found in eastern California inland, southwards to Zacatecas in Mexico. Grayest of the subspecies: like *T. b. cryptus* but dorsum is paler and grayer; central rectrices are grayish brown.
- *T. b. mexicanus*. First reported by Deppe in 1830. Includes former subspecies *T. b. bairdi* (Salvin and Godman, 1880); *T. b. murinus* (Hartlaub, 1852); and *T. b. percnus* (Oberholser, 1898). Resident in Mexico from the Transvolcanic belt south through Oaxaca. Similar to *T. b. sadai* but dorsum is darker (especially on crown) and redder and ventrum is grayish.
- *T. b. calophonus*. First reported by Oberholser in 1898. Includes former subspecies *T. b. ariborius* (Oberholser, 1920) and *T. b. hurleyi* (Jewett, 1944). A resident west of Cascades from southwestern British Columbia to northwestern California and locally east in south-central Washington. Similar to the nominate species but the dorsum is darker and less reddish and the bill is heavy and thick; body size is modest (wing 51–57 mm, tail 50–56 mm).
- *T. b. marinensis*. First reported by Grinnell in 1910. Found in Coastal northwest California to Marin County. Like *T. b. calophonus* but the bill is thin and the body size averages smaller.
- *T. b. spilurus*. First reported by Vigors in 1839. A resident in coastal central California from San Francisco Bay south to Monterey Bay. It has wintered south to southern California. Like *T. b. marinensis*, but the dorsum is browner (less red) and the central rectrices are gray-brown (less red).
- *T. b. drymoecus*. First reported by Oberholser in 1898. Found in southwest Oregon to California Central Valley. Similar to *T. b. spilurus*, but the dorsum is both brown and paler; flanks are brown.
- *T. b. charienturus*. First reported by Oberholser in 1898. Includes former subspecies *T. b. nesophilus* (Oberholser, 1898); *T. b. catalinae* (Grinnell, 1910); *T. b. carbonarius* (Grinnell, 1926); and *T. b. correctus* (Grinnell, 1928). Resident in southwest California, from Morro Bay south and including on the northern Channel Islands and in northwestern Baja California. Similar to *T. b.*

drymoecus, but the dorsum is darker and grayer (more slate than brown); the flanks are grayish brown.

- *T. b. leucophrys*. First reported by Anthony in 1895. Known as the San Clemente Bewick's wren. Formerly San Clemente Island, California. Extinct since the 1940s due to habitat destruction by feral goats and sheep. Also called *T. b. anthonyi*. Observations of *leucophrys* in 1897 refer to *T. b. cerroensis*; at that time, the San Clemente wren was considered a good species which included the Cedros population. Similar to *T. b. charienturus*, but the dorsum is paler (especially on crown) and grayer, in grayness approaching *T. b. eremophilus*; the bill is heavy and the tail shorter.
- *T. b. cerroensis*. First reported by Anthony in 1897. found on Cedros Island (Mexico) and western central Baja California. Includes former subspecies *T. b. atricauda* (Huey, 1942). Similar to *T. b. charienturus*, but the dorsum is paler (the crown less so) and markedly grayer; flanks are grayish.
- *T. b. magdalenensis*. First reported by Huey in 1942). Resident in southwestern Baja California Sur, south of 26°N latitude. Similar to *T. b. cerroensis*, but paler still; central rectrices are gray; body size is small (wing < 50 mm, tail < 50 mm).
- *T. b. brevicauda*. First reported by Ridgway in 1876. Known as the Guadalupe Bewick's wren. Formerly Guadalupe Island, Mexico. This subspecies is extinct since (probably) the late 1890s due to habitat destruction by feral goats and predation by feral cats. Over collecting by scientists might have hastened its demise. It was last collected (3 specimens) by Anthony and Streater in May 1892 and seen but found to be "nearly extinct" on March 22, 1897. It was not found by Anthony in several searches between 1892 and 1901 and considered certainly extinct by 1901; a thorough search in 1906 confirmed the subspecies' extinction.
- *T. b. altus*. First reported by Aldrich in 1944. Formerly found in Appalachian region; southern Ontario to South Carolina is now quite rare. Possibly an endangered subspecies or extinct, but possibly not distinct from *T. b. bewickii*.

Common Name: House Wren
Scientific Name: *Troglodytes aedon*

Size: 4-5 inches (11-13 cm)

Habitat: North and South America; its range is throughout North America and part of South America. North American wrens migrate to the southern United States and Mexico for winter.



In the east and Midwestern North American continent, it is known to occur primarily at or near edges of deciduous forests and in open woodlands (e.g., wooded swamps, recently burned pocosins, savannas, city parks, and residential areas with trees). In the western plains, found exclusively in wooded areas around water, or in farmyards or residential areas with trees and shrubs. In the western foothills and mountains, found in deciduous or mixed deciduous-coniferous woodlands in riparian areas within

canyons, in open ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*) parklands, in piñon-juniper (*Pinus-Juniperus*), oak, and walnut (*Juglans*) woodlands, in aspen (*Populus*) groves up to 3,000 or more m a.s.l., and at edges or in clear-cut or thinned areas of denser montane coniferous forests. Generally absent from mature, unthinned coniferous forests across the continent

Status: Least Concern. **Global Population:** 59,200,000 mature adults with an increasing trend. Some taxa, especially from the Lesser Antilles, are rare and highly endangered or possibly already extinct. Several factors seem to have contributed to a varying degree to the decline of these birds, namely habitat destruction, predation by introduced mongooses, and hurricanes.

Diet: Insects; Hemiptera is 29.3% of the diet followed by “grasshoppers and related forms” (17.6%), moths and caterpillars (13.9%), and beetles (13.8%). Smaller portions of diet made up by spiders (10.5%), bees and wasps (3.3%), and millipedes (2.8%).

Gleans small, terrestrial invertebrates from most available substrates including bare ground, leaf litter, herbaceous ground cover, and all parts of shrubs and trees.

Breeding: A moderately small wren. The head, nape, and back are a near uniform shade of brown—darker and more rufescent in eastern populations, paler and grayer in western populations. Has only a pale, often indistinct superciliary line and no striping on crown. The throat and chest uniformly light gray, sometimes with buffy or brownish tinge. Some black, dark brown, and buffy barring on flanks (usually becoming indistinct forward of legs), tail, and wings and, in western individuals, on scapulars and back. Sexes identical in plumage. No seasonal changes in plumage. Male slightly larger than female in some traits

Male begins constructing nests in empty cavities immediately upon claiming a territory; males probably claim territories within a few days if not hours of arriving back from migration. Female begins completing the nest immediately upon pairing with a male. They built nests of twigs and sticks lined with softer materials in tree cavities or nest boxes. They lay 3 to 10 eggs.

Cool Facts: The House Wren will destroy eggs of other species nesting in nest boxes. A male may build decoy nests to confuse predators. A male House Wren decides where to build the nest. Often a nest is built with more than 400 sticks. When the rough construction is complete, he advertises it to possible mates. When a female pairs with him, she takes over nest building and adds the nest cup and lining. Young male House Wrens are likely to build nests close to older, more experienced males in order to learn the ropes of fatherhood.

The first edition of this summary of House Wren biology, prepared in the mid 1990s, said that “House Wrens are arguably the most thoroughly studied passerine in North America, in part because they so readily use human-made nest sites, and because they are ubiquitous, relatively abundant across most of their range, and tolerant of human activity.” Now, two decades later, one can readily argue that we know more about the biology of the House Wren than any other wild species of bird in the world. New studies have focused on genetics, immunology, energetics and physiology, ecology, demography, reproductive and other behavior, sex allocation, communication, systematics, and more. As of the mid-2010s, more than 700 research papers, government reports, theses and dissertations had been published that touched on one or more aspects of House Wren biology.

The House Wren has one of the largest ranges of any songbird in the New World. It breeds from Canada, through the West Indies, through Central America,

southward to the southernmost point of South America. Some of the subspecies living south of the United States have been considered as separate species.

Thirty-one subspecies are divided into five groups, some of which have been treated as species (e.g., *T. cobbi*, Cobb's Wren of the Falkland Is., was split recently). Within a group, differences between subspecies tend involve subtle changes in plumage shading, amount of barring on flanks, and variation in wing-to-tail ratio.

Aedon group: Northern House Wren

- *T. a. aedon*. First reported by Vieillot in 1808. This includes former subspecies *T. domesticus* (Wilson, 1808), *T. americana* (Audubon, 1834) and *T. a. baldwini* (Oberholser, 1934). The nominate species breeds throughout northeastern portion of species' range from Maine and New Brunswick west to approximately southern Ontario and central Michigan, then south through northeastern Tennessee and the Carolinas. It winters in the southeastern United States and Gulf of Mexico lowlands possibly south to central Veracruz. The dorsum is unbarred and gray-brown washed with rufescent. The eye ring is whitish but no superciliary stripe. The ventrum is whitish to buffy and the flanks are unbarred. The length of the tail is approximately three quarters length of the wing.
- *T. a. parkmanii*. First reported by Audubon in 1839. This includes former subspecies *T. sylvestris* (Gambel, 1846), *T. a. aztecus* (Baird, 1864), *T. a. marianae* (Scott, 1885) and *T. a. vorhiesi* (Brandt, 1945). It breeds west of the Mississippi River to British Columbia and south through northern Baja California, western Kentucky, southeastern Missouri. It winters across southwestern and the south-central United States, presumably south into northern Mexico. The contact zone of this subspecies and *T. a. aedon* has not been delineated rigorously. Like *T. a. aedon*, but barred dusky and lacks the rufescent wash. Intermediates toward *T. a. cahooni* (see below) occur in the Sky Islands of southeastern Arizona and north-most Sonora.

Brunneicollis group: Brown-throated Wren

- *T. a. cahooni*. First reported by Brewster in 1888. Resident in mountains from northern Sonora, northern Chihuahua, and northern Coahuila south to Nayarit and Zacatecas. It breeds in Arizona and intermediate toward *T. a. parkmanii* (see above). The dorsum is barred and gray-brown. There is a distinct buff superciliary stripe. The throat and breast are buffy cinnamon. The flanks are barred. The length of the tail is greater than three quarters length of the wing. Its common call differs.
- *T. a. brunneicollis*. First reported by Sclater in 1858. This includes former subspecies *T. a. nitidus* (Nelson, 1903), *T. a. compositus* (Griscom, 1934), *T. a. guerrensis* (van Rossem, 1938), *T. a. culequita* (van Rossem, 1938) and *T. a. colimae* (van Rossem, 1938). It is a resident in the mountains north and west of Isthmus of Tehuantepec to Jalisco (locally Nayarit), San Luis Potosí, and through variable populations to southern Coahuila and central Nuevo

León. It looks like *T. a. cahooni*, but is browner (less gray) and the throat and breast are a more richer cinnamon.

Martinicensis group: Antillean House Wren

- *T. a. guadeloupensis*. First reported by Cory in 1886. A rare (and perhaps extinct) resident on Guadeloupe. The length of tail < $\frac{3}{4}$ length of wing. Smaller (wing < 54 mm, culmen < 17 mm) and the dorsum is brown. The ventrum is buffy cinnamon. The crissum is barred black.
- *T. a. rufescens*. First reported by Lawrence in 1877. A Resident on Dominica. It is like *T. a. guadeloupensis*, but the ventrum is deep rufous-cinnamon, and the crissum spotted black, and the dorsum more chestnut.
- *T. a. martinicensis*. First reported by Sclater in 1866. A resident on Martinique. It is like *T. a. guadeloupensis*, but larger (wing > 53 mm, culmen > 16 mm), the dorsum is grayish brown, and the ventrum paler.
- *T. a. mesoleucus*. First reported by Sclater in 1876. A resident on St. Lucia. Like *T. a. guadeloupensis*, but the ventrum is white.
- *T. a. musicus*. First reported by Lawrence in 1878. A resident on St. Vincent. Like *T. a. mesoleucus*, but larger (wing > 59 mm).
- *T. a. grenadensis*. First reported by Lawrence in 1878. A resident on Grenada. Like *T. a. martinicensis*, but the dorsum is tawny rufous and the crissum is unmarked.

Beani group: Cozumel Wren

- *T. a. beani*. First reported by Ridgway in 1885. Resident on Cozumel Island, Quintana Roo, Mexico. Most similar to *T. a. mesoleucus* of St. Lucia. The length of tail > $\frac{3}{4}$ length of wing. The mantle is russet, contrasting with a grayish brown crown. The ventrum is white. The eye ring is narrow and buff. The supercilium is thin and buff. The song and calls differ slightly from those of other groups.

Musculus group: Southern House Wren

- *T. a. peninsularis*. First reported by Nelson in 1901. Resident coastally on northern Yucatan Peninsula. The dorsum is brownish gray and modestly barred. The ventrum is white and the flanks unbarred. The supercilium is faint and the bill averages long and the tail short.
- *T. a. intermedius*. First reported by Cabanis in 1860. This includes former subspecies *T. a. hypaeton* (Sclater, 1861); *T. irrequies* (Bangs and Peck, 1908); and *T. a. oreopolus* (Chapman and Griscom, 1924). A resident from southeastern Veracruz and western Chiapas south to central Costa Rica. It is similar to *T. a. peninsularis*, but the dorsum is browner (less gray) and the ventrum is pale brown or tan.
- *T. a. inquietus*. First reported by Baird in 1864. A resident from southwestern Costa Rica to northern Colombia. It appears like *T. a. intermedius*, but the ventrum is paler and the dorsum both grayer (less brown) and more heavily barred with dusky color.

- *T. a. carychrous*. First reported by Wetmore in 1957. A resident on Isle Coiba, Panama. It is like *T. a. inquietis*, but redder overall. The bill is longer and the feet larger.
- *T. a. pallidipes*. First reported by Phillips in 1986. A resident on Archipiélago de las Perlas, Panama. It is like *T. a. inquietis*, but more rufescent and the flanks are distinctly barred.
- *T. a. atopus*. First reported by Oberholser in 1904. A resident in lowlands of northern Colombia. Similar to *T. a. inquietus*, but the dorsum is browner (less gray), the ventrum is deep ochraceous, and the crissum is barred. The bill averages longer.
- *T. a. striatulus*. First reported by Lafresnaye in 1845. A resident in tropical and subtropical zones of western and central Andes of Colombia and southwestern Venezuela. Similar to *T. a. inquietus*, but the dorsum is grayer still and ventrum, including the throat, largely whitish. The body size averages larger.
- *T. a. columbae*. First reported by Stone in 1899. A resident in subtropical and temperate zones of the eastern Andes of Colombia. It is similar to *T. a. striatulus*, but has a darker dorsum which is barred finely with dusky and the ventrum, including the throat, is vinaceous-buff.
- *T. a. effutitus*. First reported by Wetmore in 1958. A resident on the Guajira Peninsula, northeastern Colombia and northwestern Venezuela. It looks like *T. a. atopus*, but is paler overall, with the dorsum looking grayer (less brown), the ventrum is whiter (less ochraceous), and the crissum is often unmarked.
- *T. a. albicans*. First reported by Berlepsch and Taczanowski in 1883. This includes former subspecies *T. a. clarus* (Berlepsch and Hartert, 1902); *T. a. paramaribensis* (Bangs and Penard, 1918); and *T. a. chapmani* (Stone, 1918). A resident on Trinidad and in northern South America, east of Andes south to Mata Grosso, Brazil, and in western Ecuador and northern and eastern Peru. It is similar to *T. a. striatulus*, but the dorsum is rufescent brown (less gray), the ventrum is deep buff, and the throat is whitish. The body size averages much smaller (tail < 38 mm).
- *T. a. tobagensis*. First reported by Lawrence in 1888. A resident on Tobago. Much like *T. a. albicans*, but the ventrum is whiter (less buff) and averages larger in size (tail > 37 mm).
- *T. a. musculus*. First reported by Naumann in 1823. This includes former subspecies *T. a. guarixa* (Lesson, 1831); *T. aequinoctialis* (Swainson, 1834); *T. platensis* (d'Orbigny, 1838); *T. guerexa* (Lesson, 1844); *T. a. wiedi* (Berlepsch, 1873); *T. a. beckeri* (Cory, 1916); and *T. a. magellanicus* (Sztoleman, 1926). A resident in east Mato Grosso, Brazil, southward to extreme northeastern Argentina. It is similar to *T. a. albicans*, but the dorsum is paler and the ventrum is pinkish (less ochraceous) buff. The bill is shorter (<14 mm).
- *T. a. rex*. First reported by Berlepsch and Leverkühn in 1890. A resident in central and eastern Bolivia and western Paraguay eastward to northwestern Argentina. It looks like *T. a. musculus*, but the ventrum is purer buff (less pinkish) and the bill is markedly longer (>13 mm).

- *T. a. carabayae*. First reported by Chapman and Griscom in 1924. A resident in tropical and subtropical western Peru. It is similar to *T. a. albicans*, but the dorsum is a darker sooty brown and the throat is buff (not whitish).
- *T. a. puna*. First reported by Berlepsch and Stoltzmann in 1896. A resident in puna and temperate montane zones of Peru south to La Paz, Bolivia. It is similar to *T. a. musculus*, but the dorsum is less rufescent and the ventrum is deep cinnamon-buff.
- *T. a. audax*. First reported by Tschudi in 1844. Resident to arid coastal Peru. It is similar to *T. a. albicans*, but the ventrum is a uniform, deep ochraceous color and the tail is longer (>38 mm).
- *T. a. tecellatus*. First reported by Lafresnaye and d'Orbigny in 1837. Resident in southwestern Peru and northern Chile. Looks like *T. a. audax*, but the dorsum is grayer and more distinctly barred. The ventrum is also a paler whitish buff.
- *T. a. atacamensis*. First reported by Hellmayr in 1924. A resident in arid northwestern Chile. It looks like *T. a. tecellatus*, but is paler overall, the dorsum unbarred, the ventrum less white, and the rump more rufescent.
- *T. a. chilensis*. First reported by Lesson in 1830. This includes former subspecies *T. a. magellanicus* (Gould, 1836); *T. pallida* (Lafresnaye and d'Orbigny, 1837); *T. rosaceus* (Lesson, 1840); *T. a. hornensis* (Stone, 1899); and *T. a. acosmus* (Oberholser, 1904). It breeds from central Chile and Argentina south to Tierra del Fuego. It winters north to northeastern Argentina and Atacama, Chile. It is similar to *T. a. atacamensis*, but darker overall. The dorsum is sooty brown, and the ventrum rich buff.
- *T. a. bonariae*. First reported by Hellmayr in 1919. A resident from southeastern Brazil south to Buenos Aires, Argentina. It is like *T. a. chilensis*, but the dorsum is darker still (more sooty) with some faint barring.

Common Name: Eurasian Wren

Scientific Name: *Troglodytes troglodytes*

Size: 3.5-4.1 inches (9-10.5 cm)

Habitat: Eurasia, Africa and North America; Eurasian wrens are a Holarctic species. The nominate race breeds in Europe as far north as 67°N in Norway and 64°N in Sweden, Finland and Russia. The bird's southern limit is northern Spain, southern France, Italy, Sicily and southern Russia. It also breeds in Western Asia as far east as Syria. It is replaced by other races in Iceland, the Faroe Islands, the Shetlands, the Hebrides, and St Kilda, and further south in northwestern Africa, Spain and Portugal, the Balearic Islands, Corsica, Sardinia, Crete and Cyprus. Other races also occur in southern Russia and Japan, and in North America, where it occurs in the Carolinas.

It occupies a great variety of habitats, typically any kind of cultivated or uncultivated area with bushes and low ground cover; gardens, hedgerows, thickets, plantations, woodland and reed beds. It inhabits more open locations with clumps of brambles or gorse, rough pasture, moorland, boulder-strewn slopes, rocky coasts and sea cliffs.



Status: Least Concern. **Global Population:** 100,000,000-500,000,000 mature adults with an increasing population trend. In Europe, the breeding population is estimated to number 32,700,000-56,500,000 pairs, which equates to 65,300,000-113,000,000 mature individuals. National population estimates include: 10,000-100,000 breeding pairs in China; 100-100,000 breeding pairs in Taiwan; possibly

c.10,000-100,000 breeding pairs in Korea; 100-100,000 breeding pairs in Japan and possibly c.10,000-100,000 breeding pairs and 1,000-10,000 individuals on migration in Russia.

Generally, a highly successful species. Has great ability, especially in Europe, to adapt to modified habitat, and at peaks of abundance may be one of the three commonest species in Britain. Free-ranging house cats (*Felis catus*) a significant source of mortality in some UK cities. Hard winters with prolonged snow cover can cause catastrophic declines in numbers in non-migratory populations, but these normally very temporary, and recovery typically very swift. Severe winter weather especially hard on juveniles, which may suffer declines in survival rates of 25% as a result.

Diet: Insects; chiefly the larvae of butterflies and moths, such as geometer moths and owlet moths, as well as beetle larvae, fly larvae, caddisfly larvae and aphids. Other dietary items include spiders, and some seeds are also taken. The young are largely fed on moth larvae, with caterpillars of the cabbage moth and crane fly larvae having been identified.

The wren is an ever-active bird, constantly on the move foraging for insects, in the open or among thick vegetation. It moves with quick jerks, probing into crevices, examining old masonry, hopping onto fallen logs and delving down among them. It sometimes moves higher in the canopy, but for the most part stays near the ground, often being flushed from under overhangs on banks. Sometimes, it hops up the lower part of tree trunks, behaving like a miniature nuthatch. Occasionally it flits away, its short flights swift and direct but not sustained, its tiny round wings whirring as it flies.

Breeding: Male and female look alike. It is rufous brown above, greyer beneath, and indistinctly barred with darker brown and grey, even on the wings and tail. The bill is dark brown and the legs are pale brown, the feet having strong claws and a large hind toe. Young birds are less distinctly barred and have mottled underparts. The plumage is subject to considerable variation, and where populations have been isolated, the variation has become fixed in one minor form or another.

The male wren builds several nests, up to 6 or 7. These are called "cock nests" but are never lined until the female chooses one to use.

The normal round nest of grass, moss, lichens or leaves is tucked into a hole in a wall, tree trunk, crack in a rock or corner of a building, but it is often built in bushes, overhanging boughs or the litter which accumulates in branches washed by floods.

Five to eight white or slightly speckled eggs are laid in April, and second broods are reared. The eggs of the St. Kilda wren are marginally larger and often more boldly spotted; six is the usual number.

Wrens are highly polygamous, that is to say a male can have, at any one time, more than one female with an active nest on his territory. An active nest is one in which there are eggs or nestlings. A male has been recorded with four females breeding on his territory.

Cool Facts: In European folklore, the wren is the king of the birds, according to a fable attributed to Aesop by Plutarch, when the eagle and the wren strove to fly the highest, the wren rested on the eagle's back, and when the eagle tired, the wren flew out above him. Thus, Plutarch implied, the wren proved that cleverness is better than strength. The wren's majesty is recognized in such stories as the Grimm Brothers' *The Willow-Wren and the Bear*. Aristotle and Plutarch called the wren *basileus* (king) and *basiliskos* (little king). In German, the wren is called Zaunkönig (king of the fence). An old German name was "Schneekönig" (snow king), and in Dutch, it is "winterkoning" (winter king), which all refer to king. In Japan, the wren is labeled king of the winds, and the myth of "The Wren Among the Hawks" sees the wren successfully hunt a boar that the hawks could not, by flying into its ear and driving it mad.

It was a sacred bird to the druids, who considered it "king of all birds", and used its musical notes for divination. The shape-shifting Fairy Queen took the form of a wren, known as "Jenny Wren" in nursery rhymes. A wren's feather was thought to be a charm against disaster or drowning.

The wren also features in the legend of Saint Stephen, the first Christian martyr, who supposedly was betrayed by the noisy bird as he attempted to hide from his enemies. Traditionally, St. Stephen's Day (26 December) has been commemorated by "Hunting the Wren", wherein young wren-boys would catch the bird and then ritually parade it around town, as described in the traditional "Wren Song". The Wren, the Wren, the king of all birds, St. Stephen's day was caught in the furze. Although he is little, his family's great, I pray you, good landlady, give us a treat. The tradition, and the significance of the wren as a symbol and sacrifice of the old year, is discussed in Sir James Frazer's *The Golden Bough*.

According to Suetonius, the assassination of Julius Caesar was foretold by an unfortunate wren. On the day before the Ides of March, a wren was seen being pursued in a frenzy by various other birds. With a conspicuous sprig of laurel clamped in its beak, the wren flew desperately into the Roman Senate, but there its pursuers overtook it and tore it to pieces.

There are 28 subspecies of this taxonomically complex bird:

- *T. t. islandicus*. The Iceland Eurasian Wren is found in Iceland.
- *T. t. borealis*. The Faeroe Eurasian Wren is found in Faeroe.
- *T. t. zetlandicus*. The Shetland Eurasian Wren is found on the Shetland Islands.
- *T. t. hebridensis*. The Hebridean Eurasian Wren is found in the Outer Hebrides (except St Kilda).

- *T. t. fridariensis*. The Fair Island Eurasian Wren is Found on Fair Island (south of the Shetland Islands).
- *T. t. hirtensis*. The St. Kilda Eurasian Wren is found on St Kilda, in the Outer Hebrides, off Western Scotland.
- *T. t. indigenus*. The British Eurasian Wren is found in Britain (except Shetland Is and Outer Hebrides) and Ireland.
- *T. t. troglodytes*. The nominate species is found through much of mainland Europe, from Scandinavia eastward to the Urals, southward to Iberia, Italy and Greece.
- *T. t. kabyorum*. Found on Balearic Island and in northern Africa (Morocco eastward to Tunisia), perhaps also southern Spain.
- *T. t. koenigi*. Found in Corsica and Sardinia.
- *T. t. cypriotes*. Found in Cyprus and the northern Middle East (southward to northern Israel).
- *T. t. hyrcanus*. Found in the Crimean Peninsula to Caucasus Mountains, northern Iraq and Iran.
- *T. t. juniperi*. Found in northeastern Libya (from about Tocras Pass eastward to Darnah).
- *T. t. tianschanicus*. Found in the mountains from Tien Shan (possibly from Altai) southward to Pamir and northeastern Afghanistan.
- *T. t. pallescens*. Found on the Kamchatka Peninsula and Commander Island.
- *T. t. kurilensis*. Found on the northern part of Kuril Island.
- *T. t. fumigatus*. Found on the northern part of Kuril Island, Sakhalin, and Japan (including islands of Jeju and Iki).
- *T. t. mosukei*. Found on Izu Island, off southeastern Honshu (Japan).
- *T. t. ogawae*. Found on Tanegashima and Yakushima islands, off southern Kyushu (Japan).
- *T. t. taivanus*. Found in Taiwan.
- *T. t. dauricus*. Found in southeastern Siberia, northeastern China, Korea, and Tsushima Island (southwestern Japan).
- *T. t. idius*. Found in north-central China (northeastern Qinghai and Gansu eastward to Hebei).
- *T. t. szetschuanus*. Found in west-central China (eastern Xizang, southeastern Qinghai, western Sichuan).
- *T. t. talifuensis*. Found in southern China (southern Sichuan, northern Yunnan) and northeastern Myanmar.
- *T. t. subpallidus*. Found in northeastern Iran eastward to southern Uzbekistan and northwestern Afghanistan.
- *T. t. neglectus*. Found in the western Himalayas (Gilgit eastward to western Nepal).
- *T. t. nipalensis*. Found in the central and eastern Himalayas (Nepal eastward to northeastern India and southern Tibet).
- *T. t. magrathi*. Found in southeastern Afghanistan and adjacent western Pakistan.

Common Name: American Robin
Scientific Name: *Turdus migratorius*

Size: 8-11 inches (20-28 cm); **Wingspan:** 12-16 inches (31-41 cm)

Habitat: North America; widely distributed throughout North America, wintering from southern Canada to central Mexico and along the Pacific Coast.

It frequents forests, woodlands, and gardens, breeding primarily where lawns and other short-grass areas are interspersed with shrubs and trees, such as residential areas, towns, farmyards, and parks.

Status: Least Concern. **Global Population:** 30,600,000 mature adults. Stable or increasing and common. Deaths due to insecticide and lawn fertilizers are increasing. The adult robin's main predators are hawks, domestic cats, and snakes. Protected under the Migratory Bird Treaty of 1918 in the United States.



Diet: Earthworms are an important part of the Robin's diet during the breeding season, but fruit is the main diet during winter. Robins eat earthworms early in the day and more fruit later in the day.

Breeding: The head varies from jet black to gray, with white eye arcs and white supercilia. The throat is white with black streaks, and the belly and under tail coverts are white. The American robin has a brown back and a reddish-orange

breast, varying from a rich red maroon to peachy orange. The bill is mainly yellow with a variably dark tip, the dusky area becoming more extensive in winter, and the legs and feet are brown.

The sexes are similar, but the female tends to be duller than the male, with a brown tint to the head, brown upper parts and less-bright underparts. The juvenile is paler in color than the adult male and has dark spots on its breast and whitish wing coverts.

Robins roost communally in the winter and can number in the hundred of thousands. In the summer, females sleep on the nests and males congregate in roosts. As young robins become independent, they join the males in the roost. Female adults go to the roosts only after they have finished nesting.

They built nests of twigs and sticks, held together often with mud and lined with fine grass. The nest sits low in tree hidden by dense foliage with 3 to 4 blue eggs.

While the Robin can have up to three successful broods in one year, only 40 percent of nests successfully produce young. Only 25 percent of those fledged will survive to November. From that point on, about half of the robins alive in any year will make it to the next. Robin can live to be 14 years old.

Cool Facts: It is named after the European robin because of its reddish-orange breast, though the two species are not closely related, with the European robin belonging to the Old World flycatcher family. It is the state bird of Connecticut, Michigan, and Wisconsin.

While pesticides and fertilizers in lawn can be deadly to Robins so can be a heat wave on berries. Many a berry-eating bird has died from getting drunk on fermented berries.

Robins are considered the harbingers of spring; however they rarely show up until late spring.

Seven subspecies of American robin are recognized. These subspecies intergrade with each other and are only weakly defined.

- *T. m. nigriceus*. First reported by Aldrich and Nutt in 1939. The “Newfoundland Robin” breeds from northern and central Québec eastward through Labrador to Newfoundland . It winters from Maritime Provinces westward to the Great Lakes and southward to northern Florida and Mississippi. It is a vagrant to Greenland and Louisiana. It is similar to *T. m. migratorius* but the mantle is blackish, the breast is deep rufous, and the throat streaks thick and coalescent.
- *T. m. migratorius*. First reported by Linnaeus in 1766. The nominate species is known as the “Eastern Robin” and has the largest breeding range, extending from northern edge of treeline from northwestern Alaska east to southern Québec south to southern Alaska, central British Columbia, and

southwestern Kansas east to central Alberta, Pennsylvania, and New Jersey, It overwinters from Idaho, central Great Plains, Ohio Valley, southern Great Lakes region, and southern New England south through Mexican Plateau. Vagrants have been collected west to Pribilof Islands and California and south to Yucatán. The nominate species mantle is slate gray to brownish gray; the breast orange-red; throat streaks are fine. The white on the outer rectrix is >4 mm and usually >9 mm. The supercilium is discontinuous. The breast of the juvenile is cinnamon to tawny or buffy and spotted heavily.

- *T. m. achrusterus*. First reported by Batchelder in 1900. The “Southern Robin” is largely resident from Ohio Valley east through West Virginia to Atlantic Coast and south to central Texas and Florida, with breeding range extending southward for several decades. It overwinters in the southeastern states; vagrant to Isla Holbox, Yucatán. It is like *T. m. migratorius* but paler and grayer (less brown) dorsally and paler and tawnier (less rufescent) ventrally. It averages smaller. The breast of the juvenile is whitish and spotted modestly.
- *T. m. caurinus*. First reported by Grinnell in 1909. The “Northwestern Robin” breeds on islands from Glacier Bay, Alaska, south to Vancouver and on Olympic Peninsula, Washington, and, perhaps, northwestern Oregon. It overwinters from southwestern British Columbia (occasionally southern Alaska) southward to central coastal California and inland to Idaho. It is a vagrant to southern California and central Arizona. It is similar to *T. m. migratorius* but there is white on outer rectrix <8 mm and typically <4 mm. It is darker overall than *T. m. propinquus*.
- *T. m. propinquus*. First reported by Ridgway in 1877. The “Western Robin” breeds from southern British Columbia eastward to southwestern Saskatchewan and southward to southern California and northern Baja California and through Rocky Mountains to western Zacatecas, Guanajuato, and southwestern Nuevo León. It is partially migratory, with many overwintering southward to Baja California, Sonora, Arizona, southern Great Plains, and central Texas. It is like *T. m. migratorius* but paler overall, averages larger; white on outer rectrix <4 mm. The breast is duller (less ochraceous) and darker than *T. m. phillipsi*.
- *T. m. phillipsi*. First reported by Bangs in 1915. The “Mexican Robin” is a resident in highlands of Jalisco, Guanajuato, and southern Hidalgo south to southern Oaxaca. It is like *T. m. propinquus*, but darker dorsally, more ochraceous (less red) ventrally.
- *T. m. confinis*. First reported by Baird in 1864. The “San Lucas Robin” is a resident in the dry mountains of Sierra Victoria and other mountains in the Cape region of Baja California Sur. It is pale overall, the mantle is smoke gray and the breast is creamy buff. The supercilium is complete. It was formerly treated as a distinct species.

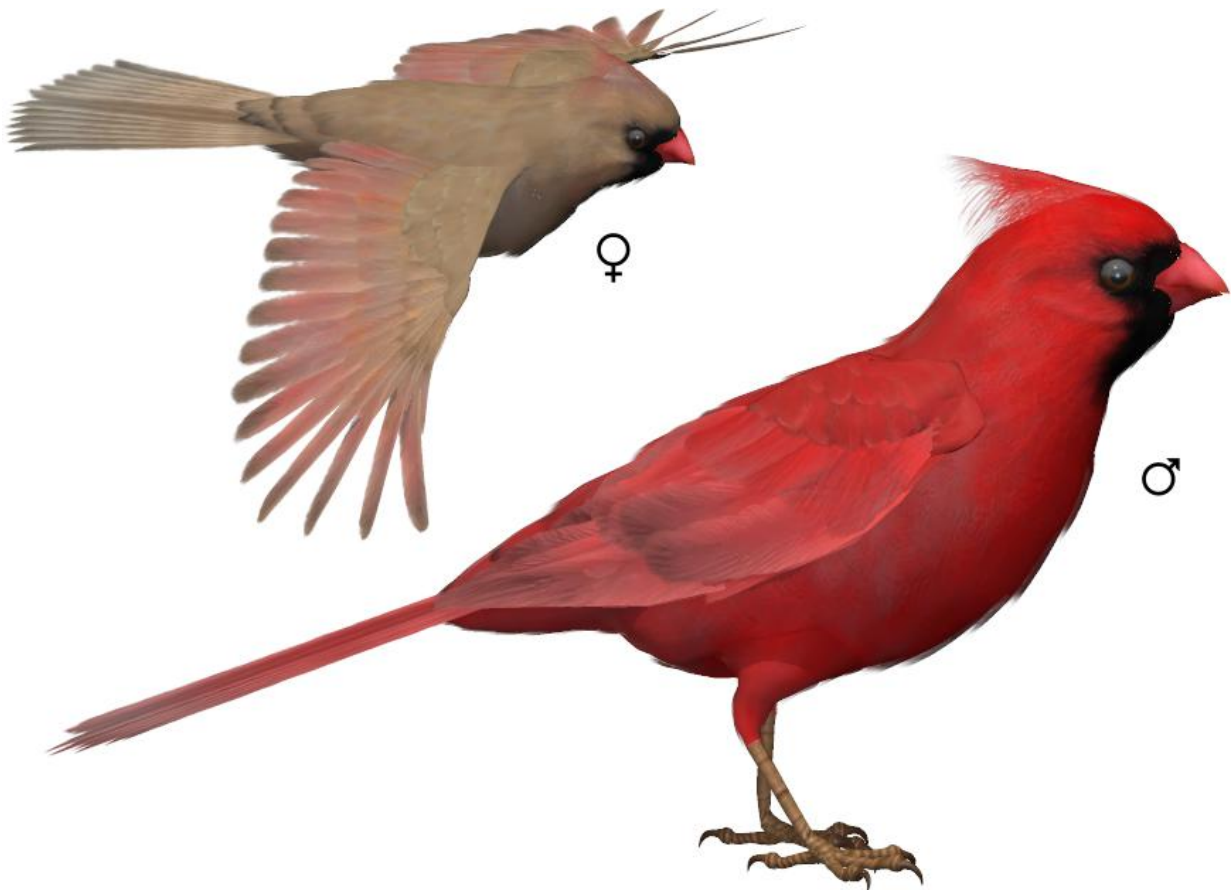
Common Name: Northern Cardinal
Scientific Name: *Cardinalis cardinalis*

Size: 8.3-9.2 inches (21-23.5 cm); **Wingspan:** 9.8-12.2 inches (25-31 cm)

Habitat: North America; numerous across the eastern United States from the southern half of Maine to Minnesota to the Texas-Mexico border and in Canada in the southern portions of Ontario, Quebec, New Brunswick and Nova Scotia, all the way east to Cape Breton Island. Its range also extends south through Mexico to the Isthmus of Tehuantepec, northern Guatemala, and northern Belize. An allopatric population is found on the Pacific slope of Mexico from Jalisco to Oaxaca; note that this population is not shown on the range map. The species was introduced to Bermuda in 1700. It has also been introduced in Hawaii, southern California and southern Arizona.

Status: Least concern. **Global Population:** 10,400,000 mature adults. Stable within most of its territory. It's a species of concern in California where it has lost most of its habitat. Protected under the Migratory Bird Treaty of 1918 in the United States.

Diet: Seed, nuts, fruit and insects.



Breeding: The male averages slightly larger than the female and is sexually dimorphic. The adult male is a brilliant crimson red color with a black face mask over the eyes, extending to the upper chest. The color becomes duller and darker on the back and wings. The female is fawn, with mostly grayish-brown tones and a slight reddish tint on the wings, the crest, and the tail feathers. The face mask of the female is gray to black and is less defined than that of the male. Both sexes possess prominent raised crests and bright coral-colored beaks. The beak is cone-shaped and strong.

Young birds, both male and female, show coloring similar to the adult female until the fall, when they molt and grow adult feathers. They are brown above and red-brown below, with brick-colored crest, forehead, wings, and tail. The legs and feet are a dark pink-brown. The iris of the eye is brown.

They built nests of twigs, sticks and sometimes paper-lined. They lay 3 eggs; Buffy white with medium brown spots.

Cool Facts: The cardinal is the United States State government's most popular bird; it's the state bird in 7 states. The plumage color of the males is produced from carotenoid pigments in the diet. Coloration is produced from both red pigments and yellow carotenoid pigments. Northern cardinal males normally metabolize carotenoid pigments to create plumage pigmentation of a color different from the ingested pigment. When fed only yellow pigments, males become a pale red color. A few "yellow morph" cardinals lack the enzyme to do this conversion. Their beak and feathers (except for black face mask) are yellow. Sightings are rare.

Males are highly competitive over territory and often will challenge their reflections for hours. Female sing a more complicated song than the males which is believed to give their mates shopping lists (food requirements) and nest information.

There are 19 subspecies:

Cardinalis Group

- *C. c. cardinalis*. First reported by Linnaeus in 1758. The nominate species is found mostly in the eastern half of U.S. and southeastern edge of Canada. Northern boundary southeastern South Dakota northeast through southern Nova Scotia. Western boundary (except introduced populations) through southeastern South Dakota, central Nebraska, west Kansas, east Oklahoma, and central Louisiana. East to Atlantic Coast, except southeastern Georgia and peninsular Florida. Introduced in Bermuda, Hawaii and vicinity of Los Angeles, CA. Females face-mask is grayish; male crest is much duller red than breast.
- *C. c. floridanus*. First reported by Ridgway in 1896. A resident to southeastern Georgia and peninsular Florida. Both sexes are smaller and darker than *cardinalis*; The bill is similar. Intergrades with nominate *cardinalis* on border of their ranges.

- *C. c. magnirostris*. First reported by Bangs in 1903. It is a resident to southeastern Texas and southern Louisiana; this range broader, including central Oklahoma, southern Arkansas, south-central Texas, all of Louisiana, and southwestern Mississippi. It has a larger and heavier bill, and larger face-mask, than those of *cardinalis*, *floridanus*, or *canicaudus*. Otherwise most like *floridanus*, but the wings are slightly longer, the tail shorter, and the foot and tarsus larger. The red of male head and underparts is lighter than on *floridanus*, but more intense than on *cardinalis*. The middle of the female belly is more whitish than on *cardinalis*.
- *C. c. canicaudus*. First reported by Chapman in 1891. It is found in western Oklahoma south through central and western Texas and central and eastern Mexico from Coahuila to eastern Jalisco, Guanajuato, Hidalgo, and central San Luis Potosí and a likely introduction in vicinity of Los Angeles, CA. The wings are shorter and the bill is slightly larger than nominate species. Males are more intense red and the black band across forehead is narrower. The females are grayer above and paler beneath than nominate *cardinalis* females, with a less distinct face-mask.

Coccineus Group (Females face-mask is black; males crest is a little, if any, duller red than the breast).

- *C. c. coccineus*. First reported by Ridgway in 1873. Found on the Atlantic slope of eastern Mexico in east San Luis Potosí, Veracruz (except extreme south), northeastern Puebla, and northern Oaxaca. The bill is larger and the male plumage is more intensely colored than in the nominate *cardinalis*. The male contour feathers are almost entirely lacking grayish or brownish margins. The female is browner than the female *cardinalis*. Specimens from northernmost coast of Veracruz intergrade with *canicaudus*.
- *C. c. littoralis*. First reported by First reported by Nelson, 1897. Lowlands of s. Veracruz and Tabasco, Mexico. Similar in size and plumage to coccineus, but male plumage more purplish.
- *C. c. yucatanicus*. First reported by Ridgway, 1887. Yucatán Peninsula in Yucatán, Campeche, and n. Quintana Roo, Mexico. Similar to but smaller than coccineus; adult male slightly lighter red.
- *C. c. phillipsi*. First reported by Parkes, 1997. Coastal scrub of Yucatán, Mexico; intergrades with yucatanicus a few kilometers south of coast. Females are palest of subspecies in the coccineus group; compared with yucatanicus, much more white or near-white in abdominal region, cheeks a more greenish buff, crest a more orange red, edgings of remiges less intensely red. Male underparts paler red than on yucatanicus, back averages grayer, edgings of remiges distinctly paler and more orange red, and tertials have little or no red wash, compared to heavy dark red wash in yucatanicus.
- *C. c. flammiger*. First reported by J.L. Peters, 1913. Central and s. Quintana Roo (Mexico), ne. Belize, and Peten, n. Guatemala. See Parkes's (44) correction of name change by Paynter (43). Similar in size to yucatanicus; male underparts and edges of wing coverts and primaries brighter than on yucatanicus, and dorsal plumage has purplish tinge, darker than back color of littoralis; female underparts heavily washed with red at least to breast,

whereas in *yucatanicus*, red absent or confined to small area just below black throat.

- *C. c. saturatus*. First reported by Ridgway, 1885. Cozumel I. (state of Quintana Roo, Mexico). Smaller than *cardinalis*. Feet larger than those of *yucatanicus*; males may be indistinguishable from *flammiger* males; adult female breast much less red than that of *yucatanicus* or *flammiger*.

Igneus Group (Female face-mask whitish; male crest little if any duller red than breast. Van Rossem claimed that female plumage of *nw.* Mexican subspecies fades considerably over course of year, and that males show extensive individual variation in plumage coloration, so we have minimized use of plumage coloration for subspecies distinctions in this group.)

- *C. c. superbus*. First reported by Ridgway, 1885. Extreme se. California east through central Arizona to sw. New Mexico and south to n. Sonora, Mexico. Introduced in vicinity of Los Angeles, CA (57). Largest subspecies; much larger than nominate *cardinalis*, and bill "relatively stouter," with black of lores in male not meeting across forehead.
- *C. c. townsendi*. First reported by van Rossem, 1932. Tiburón I. and adjacent coast of central Sonora, Mexico. Similar in size and bill shape to *affinis* (see below); males somewhat lighter red than *affinis*, with dorsal plumage paler and grayer; females paler, duller, and grayer buff than female *affinis*.
- *C. c. affinis*. First reported by Nelson, 1899. Central w. Mexico in se. Sonora, sw. Chihuahua, Sinaloa, and w. Durango. Larger than *igneus* (see below), but smaller than *superbus*; bill narrower than that of *igneus*.
- *C. c. mariae*. First reported by Nelson, 1898. Tres Mariás Is. (María Madre, María Magdalena, María Cleofás), state of Nayarit, Mexico. Similar in size to *igneus* (see below), but wings longer, tail shorter, feet larger, and bill more tumid (bulging).
- *C. c. seftoni*. First reported by Huey, 1940. Central Baja California from about 28°N south to about 27°N. Intermediate in size between *igneus* (see below) and *superbus*, with smaller bill than that of either of these. *C. c. igneus*. First reported by S.F. Baird, 1860. Baja California, Mexico, south of about 27°N. Smaller than *superbus*, and bill relatively shorter and thicker.
- *C. c. clintoni*. First reported by Banks, 1963. Cerralvo I., Baja California, Mexico. Similar in size to *igneus*, wing length averaging shorter and bill length equal to or longer than those of *igneus*; males with paler and less intense red underparts and lighter gray dorsal feather edges than those of *igneus*, females grayer dorsally.

Carneus Group

- *C. c. carneus*. First reported by Lesson, 1842) W. Pacific Coast of Mexico from state of Colima to Isthmus of Tehuantepec, Oaxaca. Upper mandible shallower than that of any other subspecies, with less sinuated tomtia; crest-feathers longer and stiffer than those of other subspecies, and distinctly outlined (not blended), similar to Vermilion Cardinal (*Cardinalis phoeniceus*) of South America; female face-mask black.

Common Name: House Sparrow
Scientific Name: *Passer domesticus*

Size: 5.5-7.1 inches (14-19 cm)

Habitat: Europe, North and the Americas; the house sparrow originated in the Middle East and spread, along with agriculture, to most of Eurasia and parts of North Africa. Since the mid-19th century, it has reached most of the world, chiefly due to deliberate introductions, but also through natural and ship borne dispersal. Its introduced range encompasses most of North America, Central America, southern South America, southern Africa, part of West Africa, Australia, New Zealand, and islands throughout the world. It has greatly extended its range in northern Eurasia since the 1850s, and continues to do so, as was shown by its colonization around 1990 of Iceland and Rishiri Island, Japan. The extent of its range makes it the most widely distributed wild bird on the planet.



The house sparrow has become highly successful in most parts of the world where it has been introduced. This is mostly due to its early adaptation to living with humans, and its adaptability to a wide range of conditions

It tolerates a variety of climates, but prefers drier conditions, especially in moist tropical climates. The house sparrow is closely associated with human habitation

and cultivation. It frequently lives and even breeds indoors, especially in factories, warehouses, and zoos.

Status: Least concern. **Global Population:** 896,000,000-1,310,000,000 mature adults. Declining populations in Europe and minor decline in North America.

Diet: Feeds on the seeds of grains and weeds, but it is opportunistic and adaptable, and eats whatever foods are available.

Forging mostly on the ground. The house sparrow is a very social bird. It is gregarious during all seasons when feeding, often forming flocks with other species of birds. In towns and cities, it often scavenges for food in garbage containers and congregates in the outdoors of restaurants and other eating establishments to feed on leftover food and crumbs. It can perform complex tasks to obtain food, such as opening automatic doors to enter supermarkets, clinging to hotel walls to watch vacationers on their balconies, and nectar robbing kowhai flowers.

Breeding: This species is sexually dimorphic. The female is mostly buffish above and below, while the male has boldly colored head markings, a reddish back, and gray underparts. The male has a dark gray crown from the top of its bill to its back, and chestnut brown flanking its crown on the sides of its head. It has black around its bill, on its throat, and on the spaces between its bill and eyes (lores). It has a small white stripe between the lores and crown and small white spots immediately behind the eyes (postoculars), with black patches below and above them. The underparts are pale gray or white, as are the cheeks, ear coverts, and stripes at the base of the head. The upper back and mantle are a warm brown, with broad black streaks, while the lower back, rump and upper tail coverts are grayish brown.

The male is duller in fresh non-breeding plumage, with whitish tips on many feathers. Wear and preening expose many of the bright brown and black markings, including most of the black throat and chest patch, called the "bib" or "badge". The badge is variable in width and general size, and may signal social status or fitness. This hypothesis has led to a "veritable 'cottage industry'" of studies, which have only conclusively shown that patches increase in size with age. The male's bill is black in the breeding season and dark gray during the rest of the year.

The female has no black markings or gray crown. Its upper parts and head are brown with darker streaks around the mantle and a distinct pale supercilium. Its underparts are pale gray-brown. The female's bill is brownish-gray and becomes darker in breeding plumage approaching the black of the male's bill.

Juveniles are similar to the adult female, but deeper brown below and paler above, with paler and less defined supercilia. Juveniles have broader buff feather edges, and tend to have looser, scruffier plumage, like moulting adults. Juvenile

males tend to have darker throats and white postoculars like adult males, while juvenile females tend to have white throats.

The house sparrow is monogamous, and typically mates for life, but birds from pairs often engage in extra-pair copulations, so about 15% of house sparrow fledglings are unrelated to their mother's mate.

Nest sites are varied, though cavities are preferred. They built nests with dried vegetation, strings, feather and paper. They lay 4 to 5 eggs. Eggs hatch at the same time, after a short incubation period lasting 11–14 days. Young house sparrows remain in the nest for normally 14 to 16 days and they are fed by both parents.

Cool Facts: The House Sparrow is not endemic to North America; it was introduced by Europeans in 1851 in New York. And while the House Sparrow flourished for 150 years in North America, its populations have significantly declined in Europe.

A House Sparrow isn't a true sparrow; it's actually a finch.

Male House Sparrows show their dominance by the size of the black patch on their chest and throat. The larger the patch, the more dominant the male appears to be.

Although not a water bird, the House Sparrow can swim if it needs to, such as to escape a predator. Sparrows will even swim underwater to escape if needed.

House Sparrows are adamant dirt-bathers; digging a hole and flinging dirt as if it was water over them.

Within its Old World distribution, 11 subspecies described to accommodate geographic variation present in the House Sparrow (Summers-Smith 1988; see also Allende et al. 2001); North American populations come from individuals of *Passer domesticus domesticus* from England and Germany. Birds from western USA described as race *plecticus*, supposedly paler than nominate, but differences apparently clinal.

Subspecies form two groups, “domesticus group” and “indicus group”, these intergrading where ranges meet. Subspecies differ mainly in plumage tones and size.

Palearctic-Domesticus Group

- *P. d. domesticus*. First reported by Linnaeus in 1758, The nominate species, “European House Sparrow” is found in northern and western Europe (southward to Iberia and south-central France), east in north-central Asia (southward to Ukraine, northern Mongolia and northeastern China) to mouth of River Amur, locally also Sakhalin and western and eastern Kamchatka.
- *P. d. balearoibericus*. First reported by von Jordans in 1923. The “Western Mediterranean House Sparrow” is a resident on Balearic Island, and southern

France eastward (excluding Italy and most Mediterranean islands) to west-central Asia Minor. It is generally paler than the nominate, the males' cheek is lighter gray, the chestnut of nape and wing is more cinnamon, the gray of the crown, lower back and rump is paler (male wing c. 78 mm).

- *P. d. tingitanus*. First reported by Loche in 1867. The "Northwest African House Sparrow" is endemic to northwestern Africa (Morocco eastward to northeastern Libya). It is similar to *balearoibericus*, but with black streaking on crown that becomes almost black with wear (male wing 78·8 mm).
- *P. d. niloticus*. First reported by Nicoll and Bonhote in 1909. The "Egyptian House Sparrow" is found in Egypt (Nile Delta and Nile Valley). It is similar to *biblicus*, but paler and smaller (male wing 75 mm).
- *P. d. persicus*. First reported by Zarudny and Kudashev in 1916. The "Persian House Sparrow" is a resident in central Iran (South of the Elburz Mountains) eastward to western and southern Afghanistan. It is similar to *biblicus*, but paler (male wing 78·7 mm).
- *P. d. biblicus*. First reported by Hartert in 1910. The "Eastern Mediterranean House Sparrow" is found in southeastern Turkey, Cyprus and Levant eastward to northwestern Iran. It is paler than nominate species (male wing 81 mm).

Oriental-Indicus Group (Those in "indicus group" less robust and clearly smaller than those in "nominate group")

- *P. d. hyrcanus*. First reported by Zarudny and Kudashev in 1916. A resident of southeastern Azerbaijan and northern Iran (North of Elburz Mountains). It has chestnut areas darker and the crown streaked (male wing 76·7 mm).
- *P. d. bactrianus*. First reported by Zarudny and Kudashev in 1916. The "Turkistan House Sparrow" is found in western Turkmenistan, northeastern Iran and southern Kazakhstan eastward to Tien Shan, extreme northwestern China (northwestern Xinjiang) and northwestern Pakistan. It is paler than *rufidorsalis* (male wing 76·1 mm).
- *P. d. parkini*. First reported by Whistler in 1920. The "Kashmir House Sparrow" is found from Kashmir eastward to Sikkim. It has chestnut areas richer and darker than *bactrianus* (male wing 79·5 mm).
- *P. d. indicus*. First reported by Jardine and Selby in 1831. The "Indian House Sparrow" is found in southern Israel, southern Palestine and much of Arabia eastward to southeastern Iran, peninsular India, Sri Lanka and central southeastern Asia (eastward to Laos). It differs from nominate in strikingly white cheeks and very pale (almost white) underparts, the chestnut of back paler, accentuating contrast of the black streaks (male wing 74·4 mm).
- *P. d. hufufae*. First reported by Ticehurst and Cheeseman in 1924. A resident of the eastern Arabian Peninsula. It is paler and grayer, the chestnut pigments reduced (male wing c. 73·5 mm).
- *P. d. rufidorsalis*. First reported by C. L. Brehm in 1855. A resident of Sudan (Nile Valley southward to 13° N) and eastward to Red Sea coast in Eritrea. It has chestnut areas brighter and more extensive than *indicus* (male wing 72 mm).

Common Name: Eurasian Bullfinch

Scientific Name: *Pyrrhula pyrrhula*

Size: 6 inches (14.5-16 cm)

Habitat: Eurasia; breeds across Europe and temperate Asia. It is mainly resident, but many northern birds migrate further south in the winter.

Lowland and lower montane deciduous forest and woodlands, thickets and copses, also heaths, hedgerows and scrubby areas, parks and edges of cultivation, including orchards (mostly in spring) and gardens in towns and cities (usually more rural in E of range, occurring only around villages); in Siberia and other parts of Russia mainly in conifers, also mixed and broadleaf forest, in



Caucasus mainly in pine (*Pinus*) and tall beech (*Fagus*) forest. In N Europe and in C & E Asia prefers conifer forests with well-developed undergrowth of spruce (*Picea*), cedar (*Cedrus*), larch (*Larix*), also birch (*Betula*), yew (*Taxus*) and bamboo, to c. 3000 m, at 1400–2000 m in Altai (cineracea slightly lower than nominate) of NE Kazakhstan, and 1000–2500 m in Japan.

Status: Least Concern. **Global Population:** 35,000,000-69,999,999 mature adults with a declining population trend.

Diet: Variety of seeds, buds and shoots of various plants, also some invertebrates.

Forages at low to medium height in trees, bushes and low vegetation, occasionally on ground ; more rarely or very locally, visits birdtables and feeding stations , taking seeds of sunflower (*Helianthus*) and variety of other seeds.

While feeding usually perches horizontally or sideways on seedhead or slender twig, or on sloping perch; more rarely, hovers at outer fruit or seedheads of e.g. honeysuckle; sometimes pursues flying insects. Extracts seeds from fruit by crushing in bill and ejecting pulp, will remove seeds while leaving skin and pulp of fruit in place; smaller fruits may be swallowed whole, and flesh of hawthorn eaten whole as seeds apparently too hard; will bite off seedheads of grasses or thistles and extract seeds in bundles. Takes 20–50 seconds to eat ash seeds, c. 10 seconds of which is for de-husking; tree buds eaten at rate of up to 30 per minute. Forages alone, in pairs and in small groups of up to c. 20 individuals, sometimes more; rarely, in flocks of up to 100 individuals.

Breeding: The Eurasian bullfinch is a bulky bull-headed bird. The upper parts are gray; the flight feathers and short thick bill are black; as are the cap and face in adults (they are greyish-brown in juveniles), and the white rump and wing bars are striking in flight. The adult male has red underparts, but females and young birds have gray-buff underparts. It molts between July and October, but males do not have the duller autumn plumage that is typical of some other finches

They built nests of fine twigs with moss and lichen in the bushes or trees fairly low to the ground. They lay 4 to 7 eggs.

Cool Facts: Bullfinches are consider crop pests ravaging orchards, especially in Southwestern England, where orchards capable of yielding several tons of fruit have been stripped so efficiently that only a few pounds could be harvested.

The described subspecies include:

- *P. p. pileata*. First reported by W. MacGillivray, 1837. The nominate species, known as the “British Bullfinch” is found in the British Isles. Some regional variation within *pileata*: birds from Ireland paler than those in southern England, and males in western and central Scotland are slightly darker and females paler or grayer than corresponding sexes in central England.
- *P. p. europaea*. First reported by Vieillot in 1816. The “Western European Bullfinch” is found in western and central Europe.
- *P. p. iberiae*. First reported by Voous in 1951. The “Iberian bullfinch” is found in the mountains of southwestern France, northern Portugal and northern Spain.
- *P. p. pyrrhula*. First reported by Linnaeus in 1758. The “Northern European bullfinch” is found in northern, south-central and eastern Europe across Siberia and central Asia to the Sea of Okhotsk.

- *P. p. rossikowi*. First reported by Derjugin & Bianchi in 1900. The “Caucasian Bullfinch” is found in Turkey, the Caucasus and northwestern Iran.
- *P. p. caspica*. First reported by Witherby in 1908. The “Caspian Bullfinch” is found in Azerbaijan and northern Iran.
- *P. p. cineracea*. First reported by Cabanis in 1872. The “Baikal Bullfinch” is found in Siberia, northeastern Kazakhstan, Mongolia and China.
- *P. p. cassinii*. First reported by S.F. Baird in 1869. The “Cassin's Bullfinch” is found in Russian Far East and northeastern China.
- *P. p. griseiventris*. First reported by Lafresnaye in 1841. The “Grey-bellied Bullfinch” is found in the Russian Far East, China, Korea and Japan.

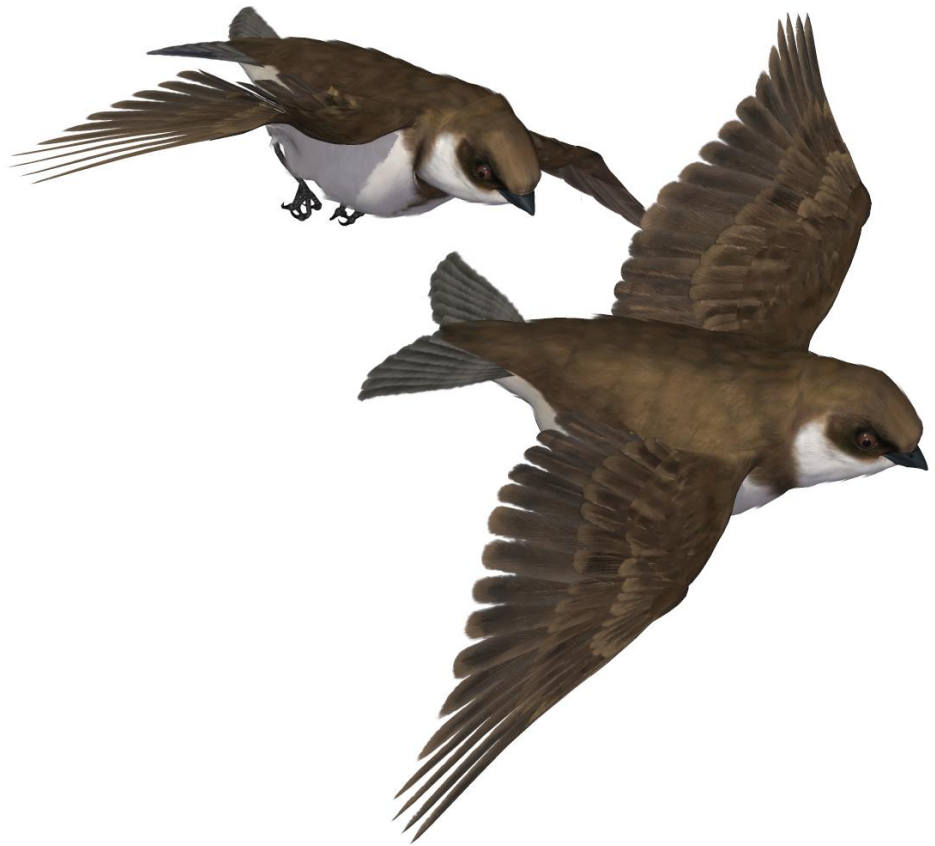
The “Azores Bullfinch” (*P. murina*), previously regarded as a subspecies of the Eurasian Bullfinch, is now recognized as a separate species.

Common Name: Bank Swallow
Scientific Name: *Riparia riparia*

Size: 4.7-5.5 inches (12-14 cm) **Wingspan:** 9.8-13.0 inches (25-33 cm)

Habitat: Throughout the World. Summer Range: Breeds from western Alaska to Newfoundland, southward to central United States and southern Texas. Also across Eurasia. Winter Range: Winters in South America, with some in Mexico. Also in Africa and southern Asia.

Bank Swallows live in low areas along rivers, streams, ocean coasts, and reservoirs. Their territories usually include vertical cliffs or banks where they nest in colonies of 10 to 2,000 nests. Though in the past Bank Swallows were most commonly found around natural bluffs or eroding stream-side banks, they now often nest in human-made sites, such as sand and gravel



quarries or road cuts. They forage in open areas and avoid places with tree cover.

Status: Least Concern. **Global population:** 10,000,000-50,000,000 Mature individuals with a steep decreasing population trend. Bank Swallows are listed by Partners in Flight as a Common Bird in Steep Decline. Their North American numbers have crashed by an estimated 89% since 1970. The global breeding population is estimated at 26 million. They rate an 11 out of 20 on the Continental Concern Score, reflecting the fact that they are still widespread and fairly numerous, despite these extreme recent losses. While Bank Swallows are generally quite tolerant of human disturbance, threats can come from changes to its nesting habitat of vertical sand or mud banks and bluffs. Erosion control, flood control, and road building projects that remove these banks or make them less steep make them unsuitable for Bank Swallows. Construction projects that

involve high mounds of gravel or dirt can attract nesting Bank Swallows—though they can also destroy nests if the material is removed before the nesting season ends. Bank Swallows are aerial insectivores—a group that as a whole has recently undergone steep, unexplained declines.

Diet: Flying or jumping insects, such as bees, wasps, ants, butterflies, and moths. The swallows catch insects while flying, often as high as 50 feet above water or open ground. Bank Swallows only occasionally take insects from the ground or from the surface of water.

They feed singly as well as in large groups. Most often seen in flight, which is fluttery and fast with periods of brief gliding. Changes course frequently in pursuit of flying insects.

Breeding: Sexes are alike. A warm brown swallow with white underparts and a thick brown band across the chest. The head is brown with a white chin. Under wings are dark.

Bank Swallows nest in burrows in banks and sandy cliffs. In recent years, they have started to nest in gravel and sand piles in construction sites and freight yards. The small birds dig the burrows themselves, using their feet, wings, and bill. The nest is a flat platform of grass, straw, rootlets, plant stalks, or leaves, placed in long burrow in bank. Nests in colonies. 3-5 eggs.

Cool Facts: The smallest swallow in North America. Bank Swallows are one of the most widely distributed birds in the world. In the Old World, this species is known as the Sand Martin.. A Bank Swallow colony may range from 10 nests to nearly 2,000.

The male Bank Swallow often pursues females other than its mate at the colony and attempts to mate with them. The male is most likely to chase a female in her fertile period.

Subspecies:

- *R. r. riparia*. First reported by Linnaeus in 1758. The nominate species breeds throughout North America, Eurasia, Mediterranean region, and northwestern Africa. It winters in Central and South America and Africa.
- *R. r. diluta*. First reported by Sharpe and Wyatt in 1893. Breeds from southern Siberia and western Mongolia southward to eastern Iran, Afghanistan, northern India, and southeastern China. It is a vagrant to arctic North America. It is paler and grayer than nominate *riparia*, particularly on the crown and back, with a faded and indistinct breast-band. The chin and throat are washed buff, even speckled brown.
- *R. r. shelleyi*. First reported by Sharpe in 1885. It breeds in lower Egypt; and is chiefly migratory, with winter distribution in northeastern Africa. Compared with nominate *riparia*, it is shorter and has narrower wings, a more shallowly notched tail, and a narrow, paler breast-band.

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Species Accuracy and Reference Materials

Many birds of the same species do vary considerably in color. This package tries to emulate the colors and markings in the most commonly found variants. Also, there are many subspecies of most of the birds represented. Subspecies in a particular area may be significantly different than the one depicted in this set. As a rule, subspecies will be labeled on the bird icon. Usually the nominate (main species) and/or the Southern California subspecies (where the author's home is) is chosen as the represented species. In some cases, additional subspecies, dimorphic females or juveniles will appear in Songbird ReMix "freebie" section (found in the SongbirdReMix.com store area).

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 hundreds of unique bird species, some give and take is bound to occur. The goal is to give a somewhat believable approximation of the bird species rather than a scientifically accurate depiction.

Field Guide Sources:

- **"The Sibley Guide to Birds"** by David Allen Sibley
 - <https://www.sibleyguides.com/>
- **Wikipedia** (<https://www.wikipedia.com>)
- **BirdGuides.com** (<https://www.birdguides.com>)
- **BirdLife International** (<https://www.birdlife.org>)
- **Birds of the World** (<https://birdsoftheworld.org>)
- **All About Birds** (<https://www.allaboutbirds.org>)

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