

# SPECIES ACCOUNTS

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# SHARP-SHINNED HAWK

## (*Accipiter striatus*)

### Distribution

**Breeding:** Most of Canada and Alaska below tree line, south through western United States to Central America; in East, to New England, and south in Appalachians to Georgia. Also in Cuba. A more northern distribution than the Cooper's Hawk, breeding mainly in boreal forests and in western mountains. However, may breed in low densities in forested areas throughout North America.

**Winter:** Highly migratory, with large numbers passing hawk watching sites each fall. May winter throughout central and southern United States and as far south as the Bahamas, the Lesser Antilles, and South America. At least some stay north to southern Canada, especially in the vicinity of bird feeders, where prey is abundant.

### Breeding habitat

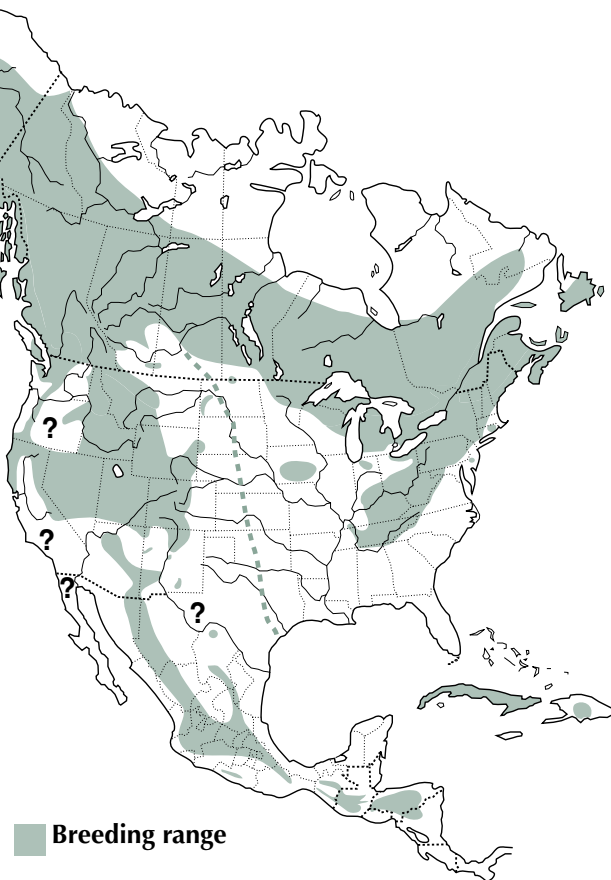
Coniferous and mixed forests. May nest in woodlots, conifer plantations, riparian forests, or forest patches in a matrix of farmlands. May prefer open stands of trees rather than dense continuous stands; this preference may vary by region. Often found near forest openings or edges, and near a stream, lake, or other body of water. Like the Cooper's Hawk, the sharp-shin may be nesting with increasing frequency near sources of human disturbance.

### Conservation status

The Sharp-shinned Hawk is a characteristic species of northern and montane coniferous forests, and being a top predator, it is a species of conservation importance. This hawk is listed as a species of concern in several states and provinces. Although migration-count data have indicated a decline in populations, breeding survey data indicate an increase. Like most raptors, this species is poorly monitored, and its precise habitat requirements are poorly known. In particular, understanding its sensitivity to forest fragmentation and various land-use practices will be important for conserving future populations.

### Description

Small-sized (pigeon or jay), forest-dwelling accipiter with a long, narrow tail and short rounded wings. Marked reverse sexual size dimorphism, with males weighing about 65% of females. Tail appears square tipped when folded, though this is less apparent



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when tail is spread. Central two tail feathers somewhat shorter than others, often causing tail to appear notched. Tail has alternating light and dark bands with a thin, white, terminal band. May soar during mornings, migration, and displays, but most flight is active, with periods of flapping alternating with short glides. Wingbeats are noticeably more rapid than those of the Cooper's Hawk and flight appears more buoyant. In flight, appears to be "short-necked," because head does not extend forward beyond the leading edge of the wings. Very thin legs noticeable when perched.

**Male:** Dark gray-brown to slate-gray back, with a slightly darker gray crown that blends with nape. Finely barred rufous underparts. Undertail coverts pure white. Iris color varies from deep reddish-orange to ruby red. Legs and cere yellow.

**Female:** Same coloration as male, but larger body size.

**Juvenile:** Attains adult plumage in second year, hatch-year birds wear juvenal plumage through their first winter. Back and upper-wing coverts medium brown. Head dark brown with faint lighter superciliary line.

Underparts creamy white with heavy reddish-brown streaking, undertail coverts white. Iris greenish-yellow to yellow, cere yellow, legs greenish-yellow.

## Vocalizations

**Song:** None.

**Calls:** Does not call frequently, except during breeding season, and has a small repertoire of vocalizations. Most common call is the *kik-kik-kik* alarm call that may be given by either sex; also sometimes given by both members of a “duetting” pair during breeding season or during displays. Female has loud “wail” call. Juveniles may give a begging call or “hunger shriek,” which sounds like a thinner, higher pitched version of the adult wail call. This call may be given by several nestlings at once and may also be used by fledglings that are still dependent on parental feeding.

## Foraging strategy

Most prey is taken while “still-hunting” from ambush or by stealthy approach flights that take advantage of landscape features to hide the approaching hawk. This may entail a twisting, circuitous flight at high speed and low altitude levels. Sharp-shinned Hawks are superb and powerful flyers, capable of rapid flight through dense vegetation. Prey is often taken in flight. Often hunt around bird feeders.

## Diet

Most (90–97%) of the prey taken are birds, a higher proportion than either of the other North American accipiters. Avian prey may range in size from warblers and sparrows to American Robins. Smaller males take correspondingly smaller prey, with prey weights averaging around 60% of those taken by female.

## Behavior and displays

- Both males and females may engage in “slow flight” territorial displays in which the birds fly with stiff, slow, exaggerated wing beats while exposing white undertail coverts. Both sexes may give the *kik-kik-kik* call during these flights.
- The *kik-kik-kik* alarm call or “undulating flight” display may be given in response to intruders in the vicinity of a nest.

## Courtship

- Courtship behavior is not well understood.
- It is likely that the male obtains and defends a breeding territory and attracts a female by calling and performing display flights.
- Courtship flights may also occur, which can involve both birds soaring on thermals, or engaging in a “slow flight” or an “undulating flight.” During

slow flight, one or both birds alternate periods of extremely slow, exaggerated wingbeats with short glides. It has been reported that during undulating flight birds follow a gradually descending path. This display may be given in response to an intruder in the vicinity of a nest.

## Nesting

**Nest Site:** Nests built in mature trees against trunk, supported by one or more large branches and generally shaded from above. Males may show a high degree of territory fidelity, with several old nests located within a small area.

**Height:** 20–60 feet (6–18 meters).

**Nest:** Substantial platform of large, often fresh, twigs broken from branches. Center lined with bark chips. Males assist in building the nest. Old nests of Cooper’s Hawks, crows, and other species may be refurbished and reused.

**Eggs:** Around 4, with an interval of about 2 days between the laying of each egg. Earliest egg records from most states are around middle of April.

**Incubation period:** Incubation by female (the male does not normally incubate) often begins with the third egg and may last about 30 days. All eggs tend to hatch within a 2–3 day period.

**Nestling period:** Young remain in nest about one month, guarded and brooded by female and fed by male who does most of the hunting. During latter phase of the nestling period, female may hunt more often, leaving young alone in nest. Young normally eject feces over the side of the nest, and the ground and bushes below nest may be liberally splattered with whitewash before young fledge.

**Fledgling period:** Fledglings remain in vicinity of nests and continue to be fed by parents until they are about 8 weeks old.

**Broods:** Normally only one brood per year, but may make another breeding attempt if a nest fails early in the season.

## Notes

- A plucking post, which may be a fence post, stump, or fallen tree, is usually located within about 150–200 feet (45–61 meters) of the nest. May be recognized by an accumulation of feathers from plucked prey and by whitewash splattered in the surrounding area. This is often the best clue that an active nest is nearby.

# YELLOW-BELLIED SAPSUCKER

## (*Sphyrapicus varius*)

### Distribution

**Breeding:** From eastern Alaska east to central Newfoundland, south to northeastern British Columbia, eastern North Dakota, New Hampshire, and locally in the Appalachians south to eastern Tennessee and western North Carolina.

**Winter:** Winters from Missouri, the Ohio Valley, and New Jersey south through the southeastern states to central Panama.

### Breeding habitat

Breeding habitat consists of open deciduous and mixed forests, including northern hardwoods, high-elevation spruce-fir, aspen groves, and some oak-hickory forests. Occurs in mature as well as secondary forests. Requires trees with soft wood or snags for excavating nesting cavities.

### Conservation status

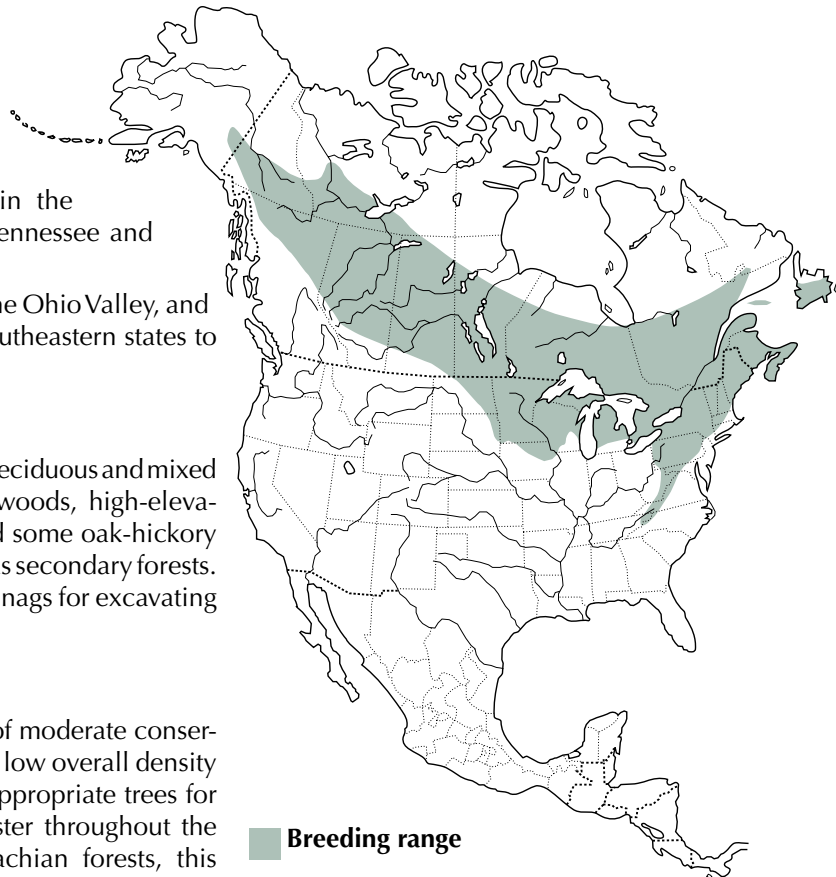
The Yellow-bellied Sapsucker is of moderate conservation importance, because of its low overall density and dependence on snags and appropriate trees for nesting. As a primary cavity nester throughout the northern hardwood and Appalachian forests, this species is important for supplying nest sites for many other forest species. Overall populations appear to be stable or increasing, but the distinctive birds of the high Appalachians are of local conservation concern. Understanding this species' sensitivity to forest fragmentation and various silvicultural practices will be important for conserving future populations.

### Description

**Male:** A medium-sized woodpecker with red forehead and crown, black hindcrown and neck, ladder-like black and white bands down the back, dark wing showing a broad white stripe. Chin and throat red, black patch on upper breast, lower breast and belly usually appear whitish but is light yellow in some conditions.

**Female:** Similar to male, but throat is white and yellow underparts are paler; some birds show an all-black crown.

**Juvenile:** Largely brownish plumage with some white barring on back, wings, and tail. White wing stripe visible, no red on head or throat.



■ Breeding range

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### Vocalizations

**Drum:** Drums on trees to establish and advertise territory; drum is a burst of about five rapid taps followed by gradual slowing with occasional double taps, territorial/courtship hammering has a Morse-code quality and rhythm.

**Calls:** Contact call is a nasal, cat-like meow, depicted as a squealing or mewing *neeah*; on territory an emphatic *QUEEah*. Close contact call is a series of hoarse and uneven *wik-a-wik-a* notes. In flight gives a nasal *geert*.

### Foraging strategy

Drills rows of holes through the outer bark and consumes cambium and tree sap, creating a sapwell. The holes they drill are lined up horizontally, each one pointed slightly downward so it collects sap. Subsequently eats a variety of insects attracted to the sapwells, also flycatches for flying insects.

They will return to the same trees over and over again and will aggressively defend their food source from other birds like the Ruby-throated Hummingbird or

small mammals attracted to the sap; ants and other insects attracted to the sap are eaten. Fruits, mast, and sumac seeds are included in the diet. They can be attracted to feeders with peanut butter, suet, and occasionally hummingbird feeders.

### ***Behavior and displays***

- When a bird arrives to take over incubation it alights below the nest hole giving a *yew-ick, yew-ick* call. Subsequently the mate will appear at the entrance, interchange a few short vocalizations with its mate and fly off before the other bird enters the hole.

### ***Courtship***

- Both sexes perform drumming duets to proclaim their territory and to attract a mate.
- Perform fluttering courtship flights; while perching, they raise their crests and bills to expose their throat, then bow.
- Ritual tapping near the nest entrance is performed.
- Perform crest raising and bill raising as well as flicking and drooping their wings when antagonized.

### ***Nesting***

**Nest Site:** Excavates cavities in snags or in living trees with rotten heartwood, including aspen, pine, birch, elm, butternut, cottonwood, alder, willow, beech, maple, and fir. May use the same nest tree for several years, but excavates a new cavity each year.

**Height:** Usually between 9–45 feet (3–5 meters) high, but ranges between 6–60 feet (2–18 meters).

**Nest:** Both sexes excavate a gourd shaped cavity leaving it lined with wood chips.

**Eggs:** 3–7 (usually 5–6) white eggs. Length of Incubation: 12–13 days.

**Incubation period:** 12–13 days, incubated by both sexes, with the male taking over these duties during the night.

**Nestling period:** Young are fed sap, fruit, insects, and regurgitated material almost constantly: both parents must return with food every 5–10 minutes. Nestlings climb to upper nest for feeding by 18 days, to entrance by 20 days.

**Fledgling period:** Young leave nest between days 25–29. Upon fledging, they are dependent upon their parents for only a few weeks, and are taught the art of sapsucking.

**Broods:** Single brooded.

**Cowbird Parasitism:** Not known to occur.



# VEERY (*Catharus fuscescens*)

## Distribution

**Breeding:** From southeastern British Columbia, central Alberta and Saskatchewan, southern Ontario, southern Quebec, southwestern Newfoundland, and Nova Scotia, south through the northeastern United States to northern New Jersey, Pennsylvania, northern Ohio, northern Indiana, northeastern Illinois, northeastern Iowa, and the northeastern corner of South Dakota. In the West, south to central Oregon, northeastern Nevada, northern Utah, and south-central Colorado. Also breeds at higher elevations in the Appalachian Mountains from western Maryland south to northern Georgia and southeastern Kentucky.

**Winter:** South America; true winter distribution poorly known, may be restricted to southwestern Brazil and possibly northern Bolivia.

## Breeding habitat

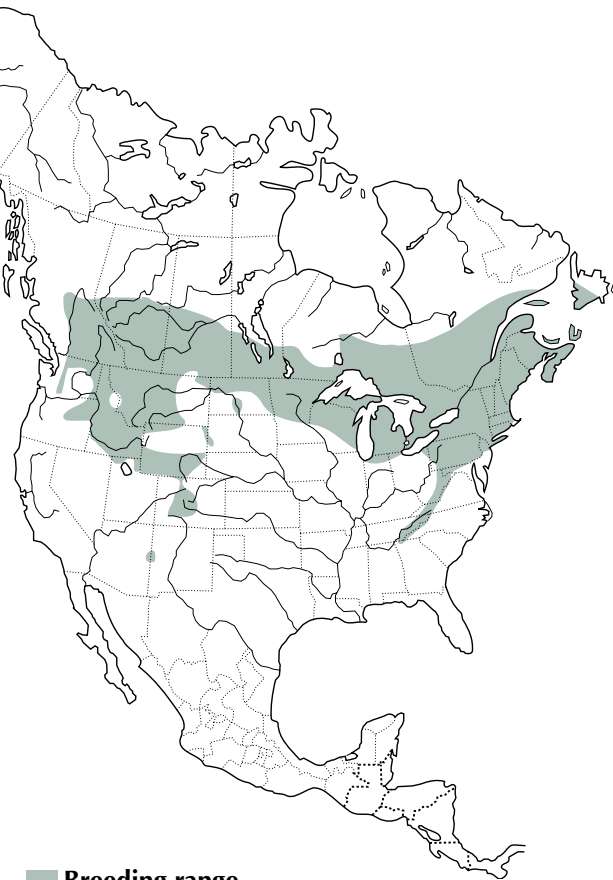
Inhabits damp, deciduous forest and riparian habitats, generally younger stands and second-growth areas with an open canopy and dense understory. They are especially fond of hemlocks in the Appalachian regions, whereas western Veeries favor dense willows and alders near water. Habitat selection may depend on the presence of other thrush species in their breeding range. The Veery may breed in mixed conifer-hardwood forest in areas where it overlaps with the Swainson's Thrush or Wood Thrush.

## Conservation status

The Veery is of moderate conservation importance, primarily because of its declining population trends in much of its range (30% decline overall since 1966) and its vulnerability as a long-distance migrant wintering in tropical forests of South America. Fortunately it is still a very common species in most of its Eastern range, where it also seems tolerant of some forest disturbance. In the West, this species is indicative of healthy riparian forests. Understanding how habitat requirements and sensitivity to fragmentation varies over its large range will be important for conserving future populations.

## Description

**Male:** Uniform reddish-brown above with an indistinct eye ring, gray cheeks and flanks. Differs from the other thrushes by its redder back, buffy-brown or



Breeding range

orangish tone to breast, and lighter spotting on throat and breast. The western form has a more olive back and slightly more spotting on breast; Newfoundland birds are also less reddish above with more heavy spotting below.

**Female:** Same as male.

**Juvenile:** Looks like the adult, but has feathers on the upperparts with buffy tips giving an overall spotted appearance. Wing coverts are edged with tawny-olive. Underparts are like adult, but tinged with tawny-olive with faint barring on breast and sides.

## Vocalizations

**Song:** Consists of a slurred series of downward inflected notes. Each note gets progressively lower in pitch, creating the sensation of spiraling or cascading down the scale. Some songs may begin with a simple, non-inflected note and end with a rolling note. The song varies less than the songs of other forest thrushes, but has an ethereal quality that makes it unique.

**Calls:** The call notes of the Veery are generally lower-pitched than those of other thrushes. The most

common call, which is used in a hostile situation, is a downward inflected *vee-ur* or *veee-oo*. They also have a *jerk* or *njernt* call.

### ***Foraging strategy***

Forages mostly on the ground by turning over leaves with bill. Sometimes searches for prey from a perch, such as a low branch in a shrub or tree or from a rock generally close to water. Swoops to the ground and grabs prey when sighted. Also, to a lesser extent, gleans or plucks fruit from the foliage. Young are fed insects.

### ***Diet***

Eats beetles, caterpillars, spiders, centipedes, snails, pill bugs, ants, wasps, and tephritid flies. In the fall and winter eats more fruit—spicebush, strawberries, juneberries, honeysuckle, blackberries, wild cherries, sumac, and blueberries.

### ***Behavior and displays***

- Sings from a concealed perch in the lower canopy or understory, otherwise usually seen on the ground.
- In conflict situations the bird holds its body in an erect posture, also may flick its wings and tail.
- In high conflict situations, usually between two males fighting over a territory, the males will raise their bills and then snap them forward at one another. Males will also chase other intruding birds from their territories.

### ***Courtship***

- The male pursues the female in flight around his territory, becoming less aggressive as the pair bond becomes stronger.
- Female may sing a duet with the male as part of courtship. The entire process generally lasts 3–4 days.

### ***Nesting***

**Nest Site:** On or just above the ground, often in a low shrub or brush pile. May be concealed in a grass tussock or under fallen limbs or a stump. Generally found in moist habitats.

**Height:** Usually on the ground, and generally not higher than 4 feet (1 meter) above the ground. Has been recorded nesting as high as 25 feet (7 meters) above the ground.

**Nest:** Nest built with twigs, grasses, and forb stems on a base of dried leaves. Lined with fine rootlets, bark strips, and more grasses. Nest is built by the female alone in 6–10 days.

**Eggs:** 3–5 (usually 4). Oval with a smooth shell, pale blue to greenish, rarely marked with brown. Very similar in appearance to the eggs of Hermit and Wood thrushes.

**Incubation period:** Incubation by the female alone, 10–14 days.

**Nestling period:** Young are altricial (born naked or with a small amount of down, eyes closed, unable to move or feed themselves). Cared for by both parents. Brooded by the female until they fledge. Young open their eyes at 5–7 days and leave the nest in 10–12 days. Parents swallow fecal sacs, may carry some away after the young reach 6 days old.

**Fledgling period:** In about 14 days the young can feed themselves on their own.

**Broods:** Usually one brood during the season, though two broods have been documented in some areas, such as New Hampshire.

**Cowbird Parasitism:** Extremely vulnerable to cowbird parasitism.



# BICKNELL'S THRUSH

## (*Catharus bicknelli*)

### Distribution

**Breeding:** On high mountain peaks from southeastern Quebec, south to the Catskill Mountains of New York, across northern New England to Nova Scotia.

**Winter:** Greater Antilles; center of range is probably the Dominican Republic; specimens and sightings are known from the Dominican Republic, Haiti, Puerto Rico, Cuba, and St. Croix.

### Breeding habitat

In New York and New England, found in sub-alpine forests (elevations >3,000 feet or 920 meters) usually dominated by balsam fir and red spruce. In Canada may breed in more varied habitats such as stunted montane coniferous, mixed second-growth, and dense coastal spruce forests.

### Conservation status

The Bicknell's Thrush is of very high importance because of its extremely limited range, small overall population, and its extreme vulnerability to deforestation in its limited winter range. Identifying large and stable populations of this species, as well as determining its precise habitat and area requirements, especially sensitivity to silvicultural practices and other disturbances, will be important for conserving populations.

### Description

**Male:** Upperparts olive-brown with a slightly more reddish tail and primaries, indistinct eye-ring. Underparts are white with bold dark spots on the breast and a slight yellow tinge. Flanks are brownish-gray. Gray-cheeked Thrush is very similar to the Bicknell's, but has more olive on both the back and tail. Bicknell's is also slightly smaller than the Gray-cheeked Thrush, especially when comparing wing length. Separation of these two species away from the known breeding range may be impossible.

**Female:** Same as male.

**Juvenile:** Buffy-brown speckled plumage.

### Vocalizations

**Song:** The Bicknell's song is very similar to the song of the Gray-cheeked Thrush. It consists of a jumbled series of notes with a final trilled note that is higher



than the preceding notes. At the end of the Gray-cheeked Thrush's song the final trilled note is slurred downward.

**Calls:** The call notes of the Bicknell's and Gray-cheeked thrushes are very similar. A common call may be transcribed as a soft *whee-ah* or *quee-a*.

### Foraging strategy

Forages by ground-gleaning or picking up insects or berries from the surface of the forest floor. Young are fed insects.

### Diet

Eats mainly caterpillars, ants, wasps, beetles, flies; in late summer eats more fruit—blueberries, bunchberries, snowberries, red-berried alder, and wild grapes.

### Behavior and displays

- Vocal activity is high throughout June, birds can be heard singing at all times of the day and during any kind of weather.

- The only vocal activity heard after the end of July are infrequent calls during dusk and dawn. In Vermont, singing resumes again in mid-September just before fall migration.

## Courtship

- The male pursues the female in a swift flight over his territory in the evening with his crest feathers erect and bill gaping.
- The male performs a dance for the female, holding his body erect with head tilted upward, wings lifted above the back fluttering softly while moving back and forth on his perch with little hops.

## Nesting

**Nest Site:** Generally close to the trunk and well hidden in small- to medium-sized conifers or occasionally in a deciduous tree such as a birch.

**Height:** 2–12 feet (0.5–4 meters) above the ground, have been recorded as high as 25 feet (7.5 meters) in Nova Scotia.

**Nest:** Bulky; made mostly of twigs and moss with a little lining of dried leaves, rootlets, and other partially decomposed organic material.

**Eggs:** 3–4, usually 4. Bluish green, faintly spotted with brown.

**Incubation period:** Incubation by the female alone, 12–14 days.

**Nestling period:** Nestlings are altricial (born naked or

with a small amount of down, eyes closed, unable to move or feed themselves). The young are fed by both parents, their feather plumes erupt from the sheaths at 6–7 days, and they leave the nest at 10–13 days.

**Fledgling period:** The young are dependent on their parents for food for approximately 10 days after they fledge.

**Broods:** One brood per season, but will lay a second clutch if nest fails early in the season.

**Cowbird Parasitism:** No information.

## Notes

- The Gray-cheeked Thrush and the Bicknell's Thrush were once considered a single species and were both known as the Gray-cheeked Thrush. Recent research has found that they are two distinct species because of differences in plumage, size, song, biochemistry, and range. The range of the Gray-cheeked Thrush is farther north than that of the Bicknell's Thrush.
- Population appears to be declining in some regions, possibly due to the destruction of habitat in environmentally sensitive areas. A species of great conservation concern in the northeastern United States.
- Recommended survey times in the northeastern United States are June 1–20 (Rimmer et al. 1996).

# BLACK-THROATED BLUE WARBLER

## (*Dendroica caerulescens*)

### Distribution

**Breeding:** Breeds from the Great Lakes region (including north-eastern Minnesota, northern Wisconsin and northern Michigan) east through southern Canada to the Maritimes. The range extends south through the New England states, higher elevations of New York and Pennsylvania, then southward through the high Appalachians to northern Georgia.

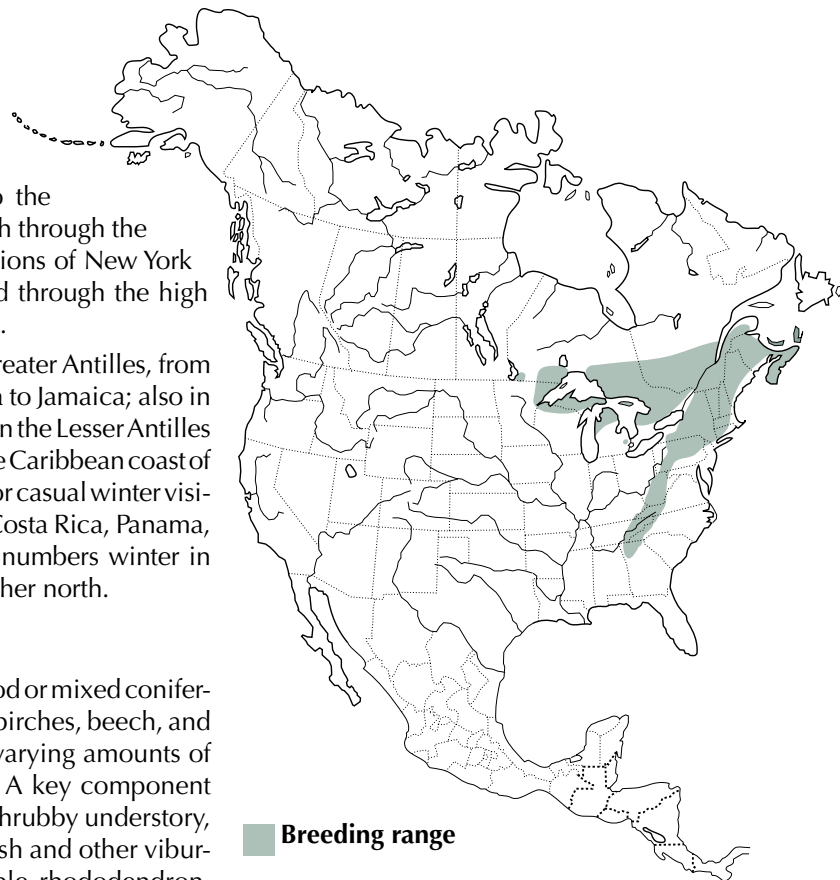
**Winter:** Primarily winters in the Greater Antilles, from Puerto Rico, Hispaniola, and Cuba to Jamaica; also in the Bahamas. Occasionally found in the Lesser Antilles as far south as Trinidad and along the Caribbean coast of Central America. Recorded as rare or casual winter visitor along the Caribbean coasts of Costa Rica, Panama, Colombia, and Venezuela. Small numbers winter in southern Florida, occasionally farther north.

### Breeding habitat

Breeds mainly in northern hardwood or mixed coniferous forests dominated by maples, birches, beech, and other northern hardwoods, with varying amounts of eastern hemlock, spruce, and fir. A key component of this species' habitat is a dense shrubby understory, especially consisting of hobblebush and other viburnum species, as well as striped maple, rhododendron, or regenerating conifers. This species occurs mostly at higher elevations 2,600–5,200 feet (800–1,600 meters) in the southern Appalachians; in New York, occurs mainly above 950 feet (300 meters), absent at lower elevations including the major river valleys and coastal lowlands. In Maine and the Adirondack Mountains, this warbler has been found to be tolerant, or even benefiting, from silvicultural practices that favor a dense regenerating understory.

### Conservation status

Although populations of this warbler appear to be stable or even increasing, it is of conservation importance because of its small overall range, low densities even in suitable habitat, and even more restricted winter range in the forests of the Greater Antilles. Associations with forest structure, especially in relation to silviculture and other land uses, are key to conserving future populations. Birds in the southern Appalachians are restricted to sensitive or threatened spruce habitats at high elevations and are of particular conservation concern.



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### Description

**Male:** Deep blue upperparts with black face, chin, throat, and sides, and otherwise white underparts. A conspicuous white patch evident on the blue wings. Southern Appalachian population has a variable amount of black mottling on the back and black streaks on the otherwise blue upperparts.

**Female:** Olive-brown upperparts and buffy below, a thin white eyebrow; may show a blueish tinge in the crown. White wing patch (as in male) usually apparent.

**Juvenile:** Brownish above and dull, whitish-buff below with brownish-olive mottling on the breast. The head shows a suggestion of a buff eyebrow and a dark cheek patch.

### Vocalizations

**Songs:** Singing is almost exclusively by the male, although females sing occasionally. Of the several song types, which vary considerably within and among individuals in speed, overall pitch, and number of notes,

the most frequent consists of 3 to 7 notes, with the last commonly slurred upward: zee-zee-zee-zreeeee.

**Calls:** A flat sounding *ctuk* given frequently throughout the breeding period by both sexes, but especially by females. Unlike the chips of most warblers, this call closely resembles call note of Dark-eyed Junco.

### ***Foraging strategy***

Very active forager, with frequent fly-catching behaviors. Individuals primarily forage alone, although members of a pair sometimes forage near one another. By rapidly moving through dense foliage, both sexes visually search upper and lower leaf surfaces, branches and twigs, tree boles, and surrounding air spaces. The most frequent capture method is to snatch prey from a substrate while hovering or flying past, but individuals also glean prey from nearby substrates while standing on the vegetation.

### ***Diet***

Primary food items are butterfly larvae and adults, crane flies and other adult flies, spiders and other arthropods.

### ***Behavior and displays***

- In territorial disputes, which occur frequently, the males swirl around the forest, chasing from high in the canopy to the shrub layer, sometimes landing on the ground for brief periods of time. These prolonged chases and conflicts can last hours or sometimes days.
- When an intruder is first discovered, the aggressor flies in rapidly, often on a gliding flutter, giving a machine gun-like aggressive trill, a series of rapidly delivered chip notes, and occasionally singing. Perching near the intruder, the aggressor assumes a head-forward posture, wings slightly flexed and drooped.
- Females are also known to chase one another.

### ***Courtship***

- As the female forages and searches for potential nest sites in the understory, males follow closely, often singing softly overhead. The male will dive at the female, and pursue her in erratic chases through the understory, or approach the female in a fluttery flight, giving a soft song. When the birds are perched, the male slightly droops his wings, extends his head forward and slightly up, with bill open, as he faces the female.
- Female solicits copulation by quivering her wings, the male responds by mounting for 2–3 seconds, then flying off.

### ***Nesting***

**Nest Site:** The nest is usually located in the dense shrub layer of either deciduous or mixed coniferous/deciduous forest, frequently in broad-leaved evergreen shrubs (e.g., Mountain laurel, rhododendron, and viburnum), conifer saplings, deciduous shrubs, or saplings.

**Height:** Nest placement is generally low, usually within 3–5 feet (1–1.5 meters) of the ground.

**Nest:** Constructed of thin strips of bark, often obtained from white or yellow birch, and occasionally pieces of rotten wood, glued together by cobwebs and apparently saliva. Built by female in 3–5 days, the male may contribute nest materials and may help shape the nest occasionally.

**Eggs:** Typically 4 eggs, clutch size can range from 2 to 5. Eggs are ivory or creamy white, speckled, blotched or clouded with tones of brown, chestnut, or gray. The female is rarely seen near the nest during the laying period.

**Incubation period:** 12–13 days, incubation solely by female.

**Nestling period:** Hatchlings are altricial: naked, except for downy tufts on head, neck, and dorsum, with eyes closed. Female broods recent hatchlings and also when the weather is cool or rainy. Both males and females feed the nestlings at about equal rates, and both appear to increase their feeding rate as fledging approaches. Departure from the nest ranges from day 8 to day 10.

**Fledgling period:** All young usually leave within a period of 30–50 minutes of one another. If late in the day, they may return to the nest for that night. At departure, young are close to adult weight, though tail and flight feathers are only about half grown. Fledglings can fly weakly, usually fluttering from one understory branch to another. The young usually remain with at least one parent who provides food and gives alarm calls. In a few cases, the parents split the brood.

**Broods:** Double brooded.

**Cowbird Parasitism:** Infrequently parasitized.

### ***Notes***

- Nest site apparently chosen solely by the female; male sometimes accompanies the female while she is searching for sites and for nest material.
- Mate guarding, with the male remaining close to the female, singing slowly from perches nearby and following her as she forages and moves about the territory, is frequently observed.

# BLACKBURNIAN WARBLER

## (*Dendroica fusca*)

### Distribution

**Breeding:** Primarily in boreal forests of Canada, from east-central Alberta east to the Maritime provinces, and in the United States from northern Minnesota to Maine and higher elevations of New England, New York and Pennsylvania; also breeds in the Appalachians as far south as northern Georgia.

**Winter:** Primarily found throughout Colombia and Venezuela and along slopes of Andes of Ecuador, Peru, and northwestern Bolivia, but most commonly in the Colombian Andes. Small numbers found at mid-elevations from Costa Rica and Panama.

### Breeding habitat

Mostly mature coniferous forest consisting of spruce, balsam fir, or hemlock; also mixed northern-hardwood forest with tall white pines or hemlocks. Will nest in Norway spruce plantations.

### Conservation status

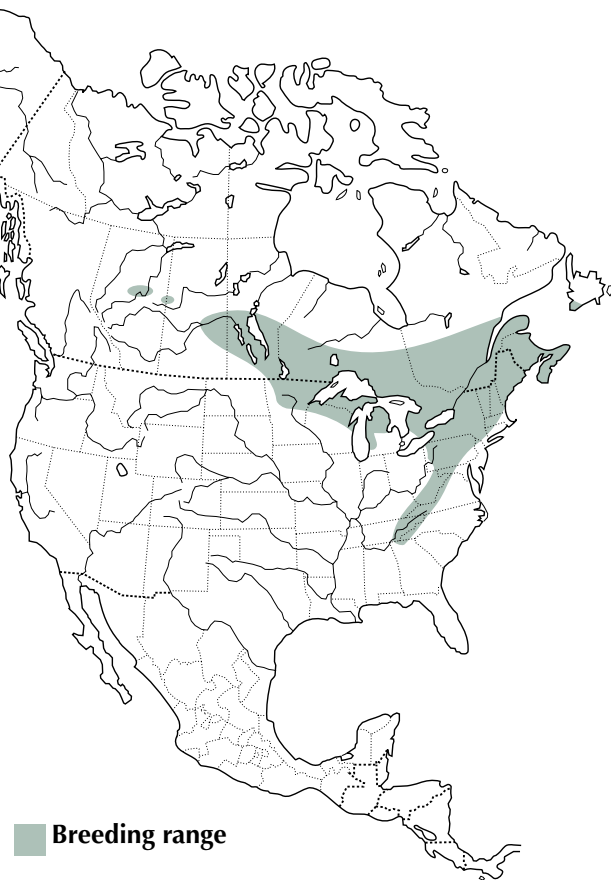
This warbler is of moderate conservation importance because of its relatively small total range, its preference for mature conifers, and its even more restricted winter range in the subtropical forests of the Andes and Middle America. At present overall populations appear to be stable, but declines have been noted in New England. Understanding the effect of forest fragmentation, and largescale silvicultural practices are important to long-term conservation planning, as is studying this species' sensitivity to habitat changes on its wintering grounds, where deforestation is rapidly taking place.

### Description

**Male:** The brilliant orange throat, neck patch, and superciliary contrasting with the black cheek and crown give this warbler a unique look. The large white wing patch is clearly visible, as are the black streaks on flanks.

**Female:** A dull version of the male, with pale orange on throat and superciliary, grayish streaks on flanks, and a gray ear patch; two white wing bars are evident.

**Juvenile:** The upperparts are dull-gray with dusky, buffy streaks. The throat and breast are pale gray-brown, the dull underparts are lightly spotted with buffy marks on the breast and flanks. The eyebrow and sides of the neck are buffy, with a brown patch



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on the sides of the head.

### Vocalizations

**Songs:** Two distinct songs known. Accented-Ending songs, which contain one or two series of thin, high notes followed by an even higher upsurred note, *zip zip zip zip zip zip zip titititi tseeeee*, are usually given by unmated males or when in the vicinity of females. Unaccented-Ending songs consist of a series of doubled, very high notes, *teetsa teetsa teetsa*.not unlike the songs of other spruce-woods warblers.

**Calls:** Most often gives a single, rich *chip* or *tsip*. The most distinctive call is a double chip, not as hoarse and metallic as that of a Black-throated Green Warbler. Will give alarm notes given when disturbed at nest.

### Foraging strategy

Primarily gleans insects from foliage on small branches, but also on twigs and larger branches, usually high in trees. They hover to pick prey from underside of vegetation, and occasionally sally for aerial insects. In spruce forests, males forage significantly higher



than females: much male foraging is in treetops at singing levels, while females forage at height of nests. In predominately deciduous forest, foraging heights of two sexes similar.

## **Diet**

Insectivorous; primarily caterpillars, although these may form only small part of the total captures. May contribute substantively to control of spruce budworm at endemic, but not at epidemic, levels.

## **Behavior and displays**

- Males exhibit elaborate patterns of chasing fleeing males, especially early in the season, such as dropping several meters in whirling, aerial encounters.
- Flight sequences may include or be followed by slow, shallow, rowing flight, known as “moth flight.” One male, chased by second male, performs this flight, combined with conspicuous tail-spread, anterior part of body at this time lower than posterior part and tail.

## **Courtship**

- Male performs courtship displays, including vibrating wings and spreading tail and a “gliding” display.
- Female crouches and flutters wings in a precopulatory display.
- Copulation has been observed as early as the second day of nest building.

## **Nesting**

**Nest Site:** Prefers conifers, although deciduous second growth at high elevations that has replaced conifers has been used. Favored conifers include spruce, hemlocks, occasionally uses white pine. The nest is

built well out from the trunk on a horizontal branch where it is concealed by foliage or lichen.

**Height:** Generally nest higher than most other species, but placement of nest can be extremely variable, with records from 3 feet (1 meter) to over 80 feet (25 meters).

**Nest:** Cup-shaped, densely constructed, and well-concealed in dense vegetation. Spider silk may be used to secure nests to site. Sides consist of twigs, bark, plant fibers, and rootlets, the inside is lined with lichens, mosses, fine grasses, hair, dead pine needles, and even occasionally such exotic substances as string willow cotton, horsehair and cattail down.

**Eggs:** 4–5 snowy to greenish white eggs, spotted or blotched with brown or reddish-brown. Small scrawls of brownish black often found.

**Incubation period:** Incubation by the female alone for 12–13 days. Female sits extremely tightly and is extremely hard to flush. Male may feed female on nest and may forage with female when she leaves the nest.

**Nestling period:** Nestlings are altricial (born naked or with a small amount of down, eyes closed, unable to move or feed themselves). Both parents feed young in nest and remove feces.

**Fledgling period:** Young are in close contact with parents for the first few days after leaving nest, do not move far, and do not call loudly or incessantly. Fledglings follow parents more often as their flying ability improves, begging as they go, sometimes literally “mobbing” parent, an activity to which parents increasingly respond in hostile manner. Later, the young join mixed foraging flocks with chickadees and other species.

**Broods:** No information.

**Cowbird Parasitism:** A known, but very uncommon, cowbird host.



# BAY-BREASTED WARBLER

## (*Dendroica castanea*)

### Distribution

**Breeding:** The occurrence of Bay-breasted Warblers is closely correlated with the distribution of spruce and balsam fir forests in Canada and the U.S. Ninety percent of range lies in Canadian boreal forest, extending west to British Columbia but with the bulk of the breeding population east of Ontario. The remaining 10% breeds in the northern U.S., primarily in Maine. Elsewhere in the U.S., it is considered an uncommon to rare breeder. Breeding range does not extend south along Appalachian Mountains, as is the case for several other northern breeding warblers.

**Winter:** Southern middle America and the northwestern tip of South America, primarily in Panama, northern Colombia, and northwestern Venezuela.

### Breeding habitat

Inhabits dense, boreal forests, especially stands of mature spruce-fir, pine, hemlock, or mixed forest, that is broken by small clearings, swamps or bogs. Does not usually nest in deciduous forest, but will in response to caterpillar outbreaks. Occasionally uses Norway spruce plantations.

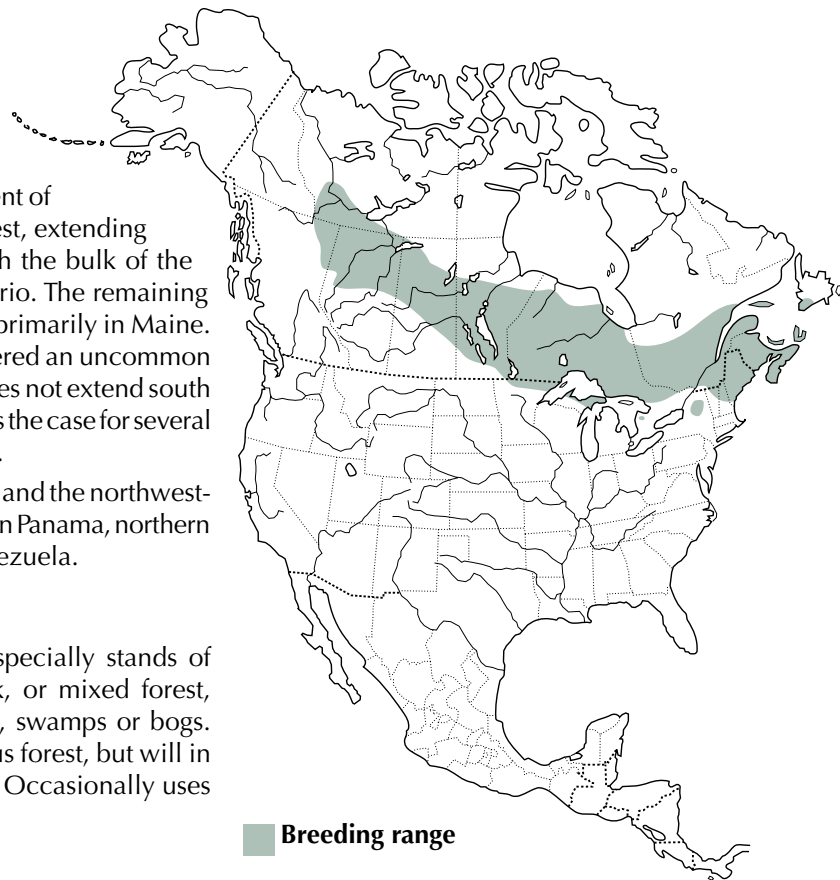
### Conservation status

The Bay-breasted Warbler is of moderate conservation concern because of its relatively narrow breeding range (primarily in belt of closed boreal forest in Canada), and its even narrower winter range in tropical lowland forests. Because of its use of mature forest stands with tall conifers for breeding, studying the effects of fragmentation and largescale silvicultural practices is important for the Bay-breasted Warbler's conservation. Populations have declined significantly in a large portion of this species' range, particularly in Maine and the Maritime provinces.

### Description

**Male:** Distinctive breeding plumage consists of rich bay colors on the crown, throat, sides, and flanks, coupled with a distinct black mask covering the face and forehead. Two white wing bars are prominent, as is a buffy patch on the neck; white corners can be seen on the tail.

**Female:** A drab greenish and buffy warbler with two prominent white wing bars; diagnostic markings include buff or rufous wash on the flanks and breast, a



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bay-colored crown-patch, a split, buffy eye-ring, and mottled blackish cheeks.

**Juvenile:** Dull olive-gray and strongly streaked above; buffy-white and spotted with dusky marks below. Also shows a yellowish tinge on the sides of the head.

### Vocalizations

**Songs:** The Bay-breasted Warbler's song is composed of 5–10 very high, thin, squeaking single or double notes, varying little in pitch, rendered as *se-atzee-atzee*, or *seetzy-seetzy, seetzy, seetzy-see*. The number and pattern of single and double notes varies among individuals. The song is generally soft and very high pitched, one of the highest of any of the North American wood-warblers. The tonal quality and pattern is similar to Cape May Warbler, from which Bay-breasted Warbler is nearly indistinguishable by human ears.

**Calls:** A high-pitched, loud, and buzzy call note, *zip* or *zee*, is given both in flight and while feeding. A sharp-sounding metallic *chip* and a *tititi* call are both given in alarm. Also gives a loud, sweet *chip*.

## Foraging strategy

Generally gleans prey from the mid-level, inner part of coniferous trees, particularly on lichen-covered limbs with little foliage, but readily forages at other heights within the tree and in broad-leaved foliage. Movement is primarily in a radial direction around tree, or moving along branches, or short flights to adjacent branches. Occasionally sallies or hovers to capture insects.

## Diet

Primary food items are caterpillars, beetles, flies, moths, and budworms. Specific prey include click, ladybird, leaf-eating, June and other beetles, house flies, gall flies, Mayflies ants, lace-winged flies, ichneumon flies, moths and their cocoons, and canker worms. Outbreaks of spruce-budworm, which affect fir as well as spruce trees, and black-headed budworm have been shown to affect territorial behavior and clutch size (see "Behavior and Displays" and "Nesting-Eggs" below).

## Behavior and displays

- Bay-breasted Warblers move slowly and slug-gishly (for a warbler), but deliberately, among branches.
- Though not a habitual tail-wagger like Prairie and Palm warblers, Bay-breasteds wag or flick their tail through shallow 15 degree arc in a down-up movement while feeding.
- Males attack and chase each other on breeding grounds, especially when superabundant food supplies exist, like during spruce-budworm outbreaks.
- Crown feathers are raised during alarm.

## Courtship

- No information.

## Nesting

**Nest Site:** Often located on the limb of a dense conifer 4.5–10 feet (1.5–3.0 meters) out from the trunk. Favored tree species are black spruce or balsam fir, but occasionally nests in a pine or hardwood in a mixed-forest habitat, or, less frequently, in shrubs.

Sometimes nests on the edge of coniferous forest where it joins secondary deciduous forest.

**Height:** Usually 12–25 feet (4–7 meters) above the ground in the lower third of a tree, but can range from 3–40 feet (1–12 meters) and may be placed as high as top of tree.

**Nest:** Cup-shaped with a thick rim and a relatively thin bottom. Sides are fragile and constructed of loosely woven conifer twigs, bark shreds, coarse dried grasses, lichen, insect and spider silk, spider webs, and plant down; the cup is lined with fine rootlets, pine needles, hair, moss, and fine grasses. Nest built by female, who is accompanied by male.

**Eggs:** 4–7, usually 5, occasionally 6. Clutch size varies with spruce-budworm outbreaks in boreal coniferous forests. The white, creamy white, pale bluish-white, or pale greenish-white eggs are boldly speckled, spotted, or blotched with brown or chestnut colors. Shell is smooth and glossy.

**Incubation period:** Incubation by female alone, 12–13 days.

**Nestling period:** Nestlings are altricial and covered with brown down at hatching. For the first few days the female broods the young while male brings food to the female. Female often trembles, slightly droops and rapidly flutters her wings when the male arrives at nest; the male responds by passing food to female. Although both parents bring food to young, the female feeds nearly 3 times as much as the male. Young leave the nest at 10–11 days.

**Fledgling period:** Young are able to stand and fly short distances upon fledgling, but remain close to the nest and are fed by adults for several days after departure. In one instance, both adults and 1 young were still in the nest 8 days after the rest left the nest.

**Broods:** No information.

**Cowbird Parasitism:** Rare host for Brown-headed Cowbird, as the ranges of these two species rarely overlap.

## Notes

- Presumably monogamous, though some pair bonds are brief and quickly shifted during instances of extralimital nesting. Some evidence for extra-pair relationships and mate-switching exists.

# CANADA WARBLER

## (*Wilsonia canadensis*)

### Distribution

**Breeding:** Breeds in a belt of boreal and northern hardwood forests from southeastern Yukon, northeastern British Columbia, and northern Alberta across southern Canada to Nova Scotia, and south to central Minnesota, the Great Lakes region, New York and New England. Range extends south at higher elevations through northern New Jersey and Pennsylvania to the southern Appalachians.

**Winter:** Almost exclusively northern South America, east of the crest of the Andes, including Venezuela, Colombia, eastern Ecuador, eastern Peru, and extreme northern Brazil.

### Breeding habitat

Coniferous and mixed northern hardwood forests with dense (usually wet) undergrowth; includes aspen-poplar stands, tamarack and cedar bogs, rhododendron thickets, red maple swamps, and deciduous second growth. Appears to prefer limited ground cover, but high foliage density in the shrub layer. Limited to forested wetlands in Rhode Island and hemlock dominated ravines in Ohio.

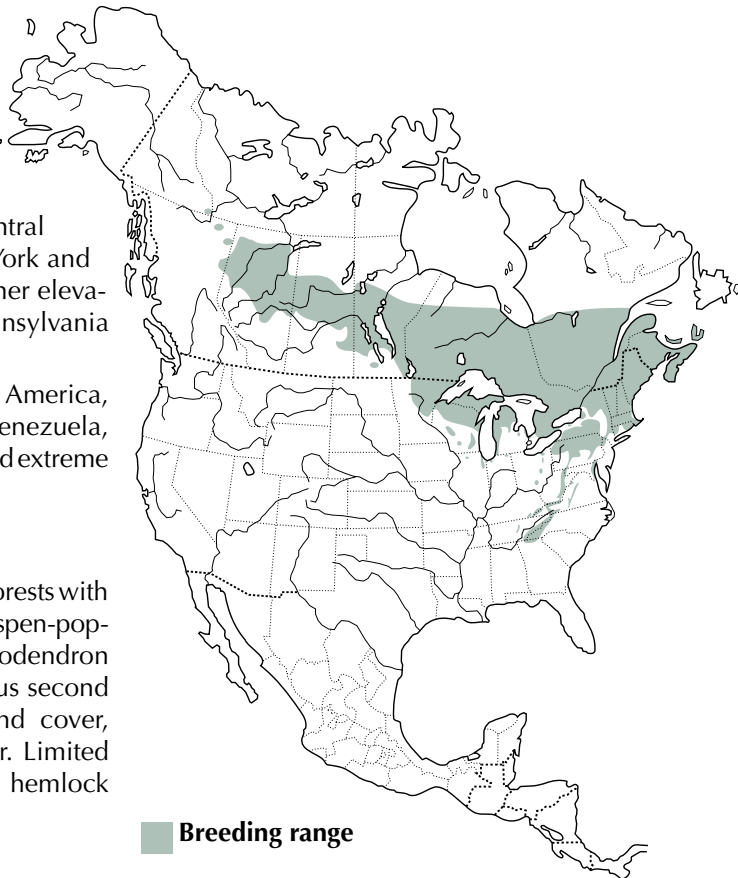
### Conservation status

This warbler is of high conservation importance, because of its low overall density, rapid deforestation in its tropical wintering grounds, and widespread population declines on the breeding grounds. An overall decline of 40% has been noted since 1966, with particularly steep drops in the spruce-hardwood forest region of eastern Canada, Maine, and the Adirondack Mountains. Although it seems tolerant of moderate disturbance, including silvicultural practices favoring regeneration of shrubs, this species' sensitivity to forest fragmentation and habitat alteration is poorly known in much of its range.

### Description

**Male:** A moderately long-tailed warbler with a distinctive black necklace across the yellow throat and breast. Upperparts are slate gray with a blacker crown and cheek contrasting with a yellow supraloral line and a bold, whitish eye-ring. No wing-bars. Undertail coverts are white.

**Female:** Similar to the adult male, but with a more olive-gray face and crown; necklace is less distinct or lacking.



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**Juvenile:** Brownish on the head and upperparts, paler buffy-brown on the underparts, paler on the belly to the undertail coverts. Obscure buffy wing bars.

### Vocalizations

**Songs:** Primary song is clear, loud, and distinctive; also extremely variable. It consists of one chip note followed by an abrupt, explosive series of short notes that invariably ends with a 3-note phrase, the last one loud and rising in pitch; consecutive notes are rarely on the same pitch. Described as *chip chupety sweet-ditchety* or *chip, suey de sweet-dictchety*.

**Calls:** A subdued *chyup* is given by both sexes, also an alarm call consisting of a loud, sharp *check* or *chip*.

### Foraging strategy

Forages in shrubs and lower tree branches of both coniferous and deciduous trees; occasionally forages on the ground. Most frequently hops along branches, though a variety of foraging techniques are employed, including flycatching, sallying, hovergleaning, foliage gleaning, and ground gleaning.

## ***Diet***

Mostly flying insects, including mosquitoes, flies, moths, beetles, also small hairless caterpillars and spiders.

## ***Behavior and displays***

- Typically active and alert; hops and climbs along branches while moving through thick vegetation.
- Often observed in low vegetation with tail cocked and wings flicked.
- Exhibits “wing display,” an agonistic display in which male faces male opponent with contour feathers sleeked, body held horizontal, and wings lifted horizontally out from body.

## ***Courtship***

- No information.

## ***Nesting***

**Nest Site:** Wet, mossy areas within forests, among ferns, stumps, and fallen logs, often in rhododendron thickets in southern part of range. Typically built within a recessed hole of an upturned tree root mass, rotting tree stump, or sphagnum moss hummock, often on slopes, knolls, in earthen banks, or rocky areas. Dense nest site cover appears to be important habitat requirement.

**Height:** On or just above ground.

**Nest:** Bulky, loosely constructed cup with exterior made of some combination of grasses, bark strips, dead leaves, plant fibers, plant down, forb stalks, moss, pine needles, and twigs with deciduous leaves woven into outer wall. Lining often contains horse, deer, or other mammal hair, and rootlets, deciduous leaves, and fine grasses.

**Eggs:** 4–5 brilliant, buffy, or creamy white eggs are slightly glossy, well speckled with dots and small blotches of various shades and tints in a wreath around the larger end.

**Incubation period:** Only the female incubates, she is considered a “close sitter” as she is difficult to flush. Incubation appears to last 12 days.

**Nestling period:** Both parents feed nestlings.

**Fledgling period:** Nestlings probably leave nest at 10 days. Young are unable to fly, but are vocal. Parents continue feeding, a male was observed feeding a fledgling a few days out of nest.

**Broods:** No information.

**Cowbird Parasitism:** In suitable localities, regular host of Brown-headed Cowbird.

## ***Notes***

- Although considered socially monogamous, the extent of extra-pair fertilizations unknown. Some evidence exists that birds maintain a pair bond year-round.

# BROAD-WINGED HAWK

## (*Buteo platypterus*)

### Distribution

**Breeding:** Widespread across southern Canada, extending from the Maritime provinces to Alberta; breeds east of the Great Plains in the United States, found south to the Gulf Coast, including northern Florida. “Dark” morphs (see “Description: Male” below) may be found in western and central Canada.

**Winter:** Southern Florida and from Mexico to South America.

### Breeding habitat

Inhabits a variety of continuous forests, generally dry woodlands and mixed conifer-hardwoods with openings and water nearby.

### Conservation status

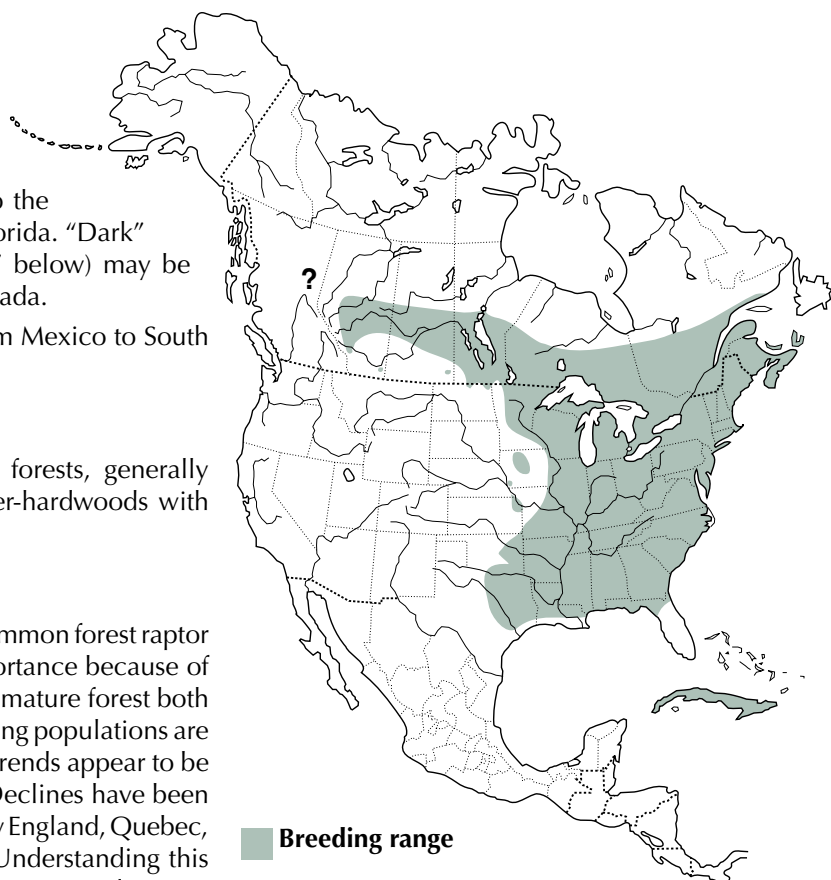
Although this is one of the most common forest raptor species, it is of conservation importance because of its association with large tracts of mature forest both for breeding and wintering. Breeding populations are poorly monitored, but long-term trends appear to be stable, based on available data. Declines have been noted, however, since 1980 in New England, Quebec, and the southern Appalachians. Understanding this species’ sensitivity to forest fragmentation and various silvicultural practices will be important in maintaining healthy populations of Broad-winged Hawks.

### Description

**Male:** Our smallest *Buteo*, wings are fairly pointed and tail is relatively short, occurs in two distinct morphs. Both “Light” and “Dark” birds have uniformly dark brown upperparts and pale underwings with a black border. “Light” birds show varying amounts of rufous streaks or bars on otherwise white breast and belly, and almost completely pale underwings. “Dark” birds, which are very uncommon (some estimates place “Dark” morphs at 1 in 50,000) show dark brown to almost black underparts; the leading edge of underwing is as dark as the breast and belly. Tail pattern in both morphs consists of wide, alternating dark and light bands.

**Female:** The plumage is the same as adult male. Although larger in size, overlap is considerable.

**Juvenile:** “Light” birds can be “lightly marked” or “heavily marked,” each showing variable amounts of



brownish streaking and barring on white breast and belly. Lightly marked birds show almost completely pale underwings, while heavily marked birds show a patterned leading edge. Like “dark” adults, dark juveniles are completely dark underneath. Tail pattern in both morphs is similar, consisting of indistinct bands; juveniles all typically show a dark moustachial streak.

### Vocalizations

**Calls:** The characteristic call is given throughout the year, including on the nest and in flight, and is described as a high-pitched whistle described as *peeeurr*, *kee-eee*, or *peeoweeee*, with the first note short and higher pitched than the second. Other calls include a “transfer,” a series of whines given by adults during food transfers; a “dismissal,” a more plaintive variation of the standard whistle given by female when male is approaching or leaving the nest; and a wheezy 2-tone whistle emitted on copulation, *whee-ohh*.



## Foraging strategy

A sit and wait predator, described as “cat-like” perched on a limb within the forest. Swoops down to snatch prey from the forest floor. Adults appear to hunt more after mid-morning.

## Diet

Diet depends on local availability of prey, but consists primarily of small mammals; also includes birds, amphibians, reptiles, and insects. Mammal prey is fully consumed, large snakes and frogs are skinned, birds are often plucked.

## Behavior and displays

- Often soars in circles above the forest, probably as a territorial function; makes short flights from branch to branch within the forest
- Defends home range from conspecifics and Red-tailed Hawks.

## Courtship

- Male and female call and respond during courtship, also performs flight displays, listed below.
- **High Circling:** an advertising display beginning immediately after arrival on breeding grounds. Birds are conspicuous and noisy, emitting *peeeurr* call. One bird, presumably male, side-slips or dives very close, to the other, presumably female.
- **Sky-dancing:** bird leaves perch, flapping upward in widening circles, calling. Then, with spread wings and tail, soars lightly back and forth, still going upward until nearly lost from sight. Finally descends with long sweeps and curves, terminating with long dash horizontal to the ground.
- **Tumbling:** a circling bird drops toward earth checking its headlong course just before reaching the ground.
- No information about courtship feeding.

## Nesting

**Nest Site:** Usually located in the main crotch of deciduous tree, or on a platform of horizontal branches against the trunk of a conifer. Often placed in the upper third of the forest’s canopy and near water. Pairs may reuse their nest, or an old crow, hawk, or squirrel nest.

**Height:** Ranges from 20–90 feet (6–30 meters), but can be placed as low as 3–9 feet (1–3 meters) above the ground.

**Nest:** Sides of nest are built of fresh twigs and old dead sticks, fresh conifer sprigs are placed on nest rim or cup but are not incorporated into the nest itself. The cup is lined with bark chips, as well as corn husks, moss, inner tree bark, red cedar, wild grape vine, lichen, covered bark, chicken feathers, or pine needles.

**Eggs:** 2–3, rarely 4, white, pale creamy, or slightly bluish eggs marked in two layers of large patches to tiny dots.

**Incubation period:** Begins with the first egg and lasts from 28–31 days, solely by female.

**Nestling period:** Young are semi-altricial and downy at hatching; female broods almost continuously during first week. Males provide food, but only visit the nest after transferring food to female away from nest. Oldest nestling secures prey and feeds until sated, after which remaining nestlings feed. The young first leave nest at 29–31 days.

**Fledgling period:** Young leave nest at 5–6 weeks, but take first flight at about 31 days; flying skills develop rapidly. Fledglings observed using nest as feeding and roost site up to 2 weeks after first flight. After that, young stay on territory 4–8 weeks, intercepting parents to obtain prey at 6 weeks and beginning to capture prey about 7 weeks.

**Broods:** Single brooded.

## Notes

- During favorable migration conditions large flocks, or “kettles,” are formed. Individuals soar to the top of thermals, and then glide to another to save energy during the long flight to the wintering area.
- Sensitive to tropical deforestation.



# EASTERN WOOD-PEWEE

## (*Contopus virens*)

### Distribution

**Breeding:** Breeds from the eastern border of the Great Plains to the Atlantic Ocean, ranging from southern Canada (Saskatchewan to the Maritime Provinces) to northern Florida, the Gulf Coast and central Texas.

**Winter:** Winters from Nicaragua to South America, mainly in the Andes of Venezuela and Peru.

### Breeding habitat

Found in a large variety of forest types, usually with a relatively open understory, but will tolerate a dense understory if the forest canopy is sparse. Forest habitats include northern hardwood, pine-oak, oak-hickory, bottomland hardwood and riparian, southern pine savannah and midwestern woodlots; also may be found in orchards, parks, roadsides, and suburban areas. Somewhat tolerant of disturbance, often occurring in forest openings, along edges, or around clearcuts and other cut-over areas.

### Conservation status

Although a fairly common bird throughout its large range, the Eastern Wood-Pewee is showing consistent declines in nearly every region. These declines, combined with vulnerability to forest loss on its South American winter range, make it a species of high conservation concern. Understanding this species' relationship with forest disturbance and fragmentation will be critical in maintaining future populations and reversing declines.

### Description

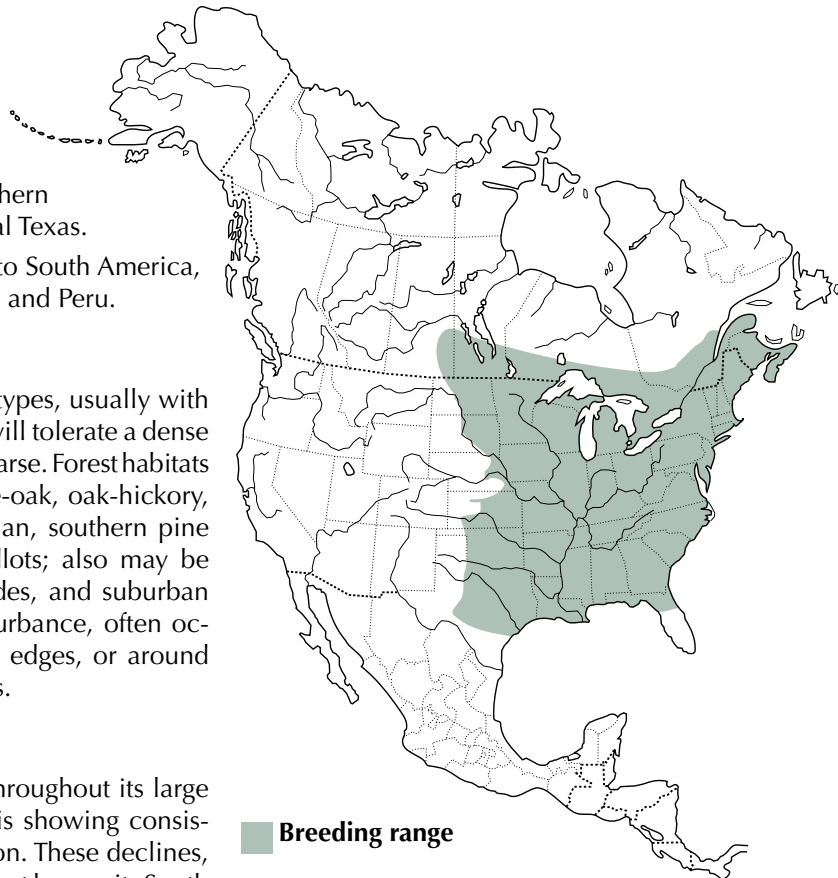
**Male:** A medium-sized flycatcher; dull grayish olive nearly throughout, with a dusky "vested" appearance below, two pale wing-bars. Compared with similar, dull flycatchers, the wood-pewee lacks a black cap or conspicuous eye-ring, has longer, more pointed wings, and shows dark markings on the undertail coverts (diagnostic).

**Female:** Same as adult male.

**Juvenile:** Same as adult, but with buffier wing-bars.

### Vocalizations

**Songs:** Most frequent song is a slurred *pee-ah-wee!*, a plaintive *wee-ooo* or *wee-ur* is also commonly heard, or slight variations including a slurred *ah di dee* are possible.



**Calls:** Common call is a terse *chip!* note, but a variety of other calls have been recorded, such as a rapid, shrill *pe-e-e-e-e* when disturbed at the nest.

### Foraging strategy

Primarily sallies out from an exposed perch to capture flying insects, usually returning to the same perch. Recorded foraging flights range from under 3 feet (less than a meter) to over 90 feet (30 meters). Occasionally takes insects from the ground or vegetation.

### Diet

Primary prey are small flying insects, including flies, bees, butterflies, wasps, and beetles.

### Behavior and displays

- Sits upright on exposed perch, often near top of a tree or at the edge of a forest opening or canopy gap.
- Territorial fighting and chasing have been reported, and males seem to alter singing patterns in response to the presence of other males.

- Males are known to physically attack other species that approach during singing.

## *Courtship*

- Although males feed females during courtship and sexual chases have been reported, detailed information about courtship and mating is unknown for this species.

## *Nesting*

**Nest Site:** Typically, nests are built on a horizontal limb well out from trunk, frequently on a dead twig on a living tree.

**Height:** Ranges from 10–100 feet (3–30 meters) above the ground.

**Nest:** A shallow cup of woven grass, weeds, wool, bark strips, twigs, roots, mosses, pine needles, or leaves camouflaged with spider webs and lichens. The cup is lined with hair, grass, moss, lichens and plant fibers.

**Eggs:** 2–4 milky white to cream-colored eggs, marked with brown to purple speckles arranged in a wreath around large end.

**Incubation period:** Appears to be 12–13 days, but this information is based on small or unknown sample sizes. Female incubates alone, but male feeds the female during incubation and remains near nest during periods of female absence.

**Nestling period:** Young are altricial. Nestlings are brooded for at least 4–5 days. Nestling diet similar to that of adult. Probably leave the nest 16–18 days but needs to be confirmed by close observation.

**Fledgling period:** Parents feed fledglings for an unknown period of time after fledging.

**Broods:** Single brooded.

**Cowbird Parasitism:** A fairly regular, but not a favorite, host of the Brown-headed Cowbird. Successfully fledges cowbirds, but no information on percentage of success.

# WOOD THRUSH

## (*Hylocichla mustelina*)

### Distribution

**Breeding:** Eastern North America, from southern Ontario, southwestern Quebec, New Brunswick, and Nova Scotia south to northern Florida, west to the eastern parts of the Great Plains in Texas, to eastern Oklahoma, Kansas, Nebraska, and South Dakota. May be slowly expanding their range northward.

**Winter:** In lowlands of Central America, from southern Mexico to western Panama; rarely in southeastern United States.

### Breeding habitat

Inhabits the interior and edges of deciduous and mixed forests, generally in cool, moist sites, often near water. Requires moderate to dense understory and shrub density with a lot of shade, moist soil, and decaying leaf litter. Shows much variation in habitat use, from mature deciduous forests in the southeast, to shrubby second-growth forests and suburban parks in the northeast to riparian habitats in the Great Plains.

### Conservation status

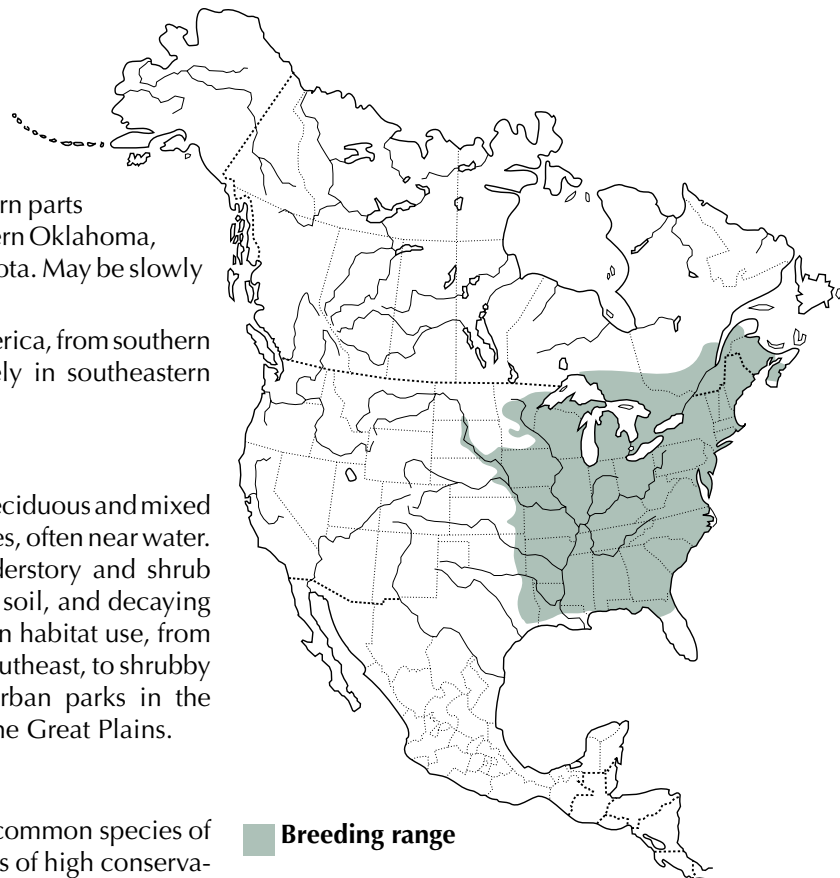
Even though it is one of the most common species of Eastern forests, the Wood Thrush is of high conservation concern because of steady, long-term population declines, nearly throughout its range. This species has declined 43% overall since 1966. This species seems to be dependent on large tracts of mature forest in some parts of its range, but is tolerant of disturbance in other areas. In winter, it is highly vulnerable to tropical deforestation in the lowlands of Central America. Understanding the precise breeding habitat requirements of this species, and how they vary geographically, will be important for reversing population declines and maintaining future populations.

### Description

**Male:** Larger than other forest thrushes; slightly smaller than American Robin. Reddish-brown on crown and nape, changing to olive-brown on back, wings, and tail. White underparts with large dark spots on throat, breast, sides, and flanks. White eye-ring.

**Female:** Same as male.

**Juvenile:** Secondary and greater coverts have a buffy edging and the black spots on the breast are not as



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well defined as those on the adults; appear to be sooty. Underparts are slightly streaked with buff.

### Vocalizations

**Song:** A series of yodeled phrases with a pause in between each phrase. A phrase consists of three distinctive parts: one or two short, low notes, quickly followed by a complex, flute-like note. It ends with a short, high trill. The phrase sounds like *ee-oh-lay*.

**Calls:** Calls include a rapid series of notes that sound like *pit-pit-pit* or *wik, wik, wik, wik, wik*.

### Foraging strategy

Forages by gleaning and probing in the leaf litter on the forest floor. Always forages under the forest canopy, hops and then pauses to scatter leaves to find prey. Sometimes hawks or hovers to glean insects or fruit from vegetation above the ground. Young are fed small insects and some fruit.

## Diet

Eats beetles, ants, moths, caterpillars, millipedes, and isopods. In the late summer and fall eats more fruit—spicebush, foxglove, blueberry, holly, elderberry, Virginia creeper, pokeweed, dogwood, black cherry, and black gum.

## Behavior and displays

- Sings from an exposed perch, usually in the lower canopy or mid-story. Often flushes from the forest floor.
- When performing an agonistic display (a behavior used to threaten another bird), there may be brief physical contact between males with feet or bill if defending a territory or nest.
- Other aggressive displays are fairly passive: wing and tail flicks, raised crests, and puffing up of breast feathers. Observed to be aggressive toward robins, Veeries, Blue Jays, and other species.
- Has been observed “anting.” Anting occurs when a bird picks up a single ant or group of ants and rubs them on its feathers. The purpose of this behavior is not well understood. It is thought that birds may be able to acquire defensive secretions from the ants possibly used for some medicinal purpose. Also may be a supplement to the birds own preen oil.

## Courtship

- The male arrives and establishes a territory several days before the female arrives on the breeding ground.
- The female leads silent circular flights about 3–6 feet (1–1.8 meters) from the ground, with the male chasing the female. Generally 6 or more flights take place in succession. In between each flight the pair perches together and may feed one another.

## Nesting

**Nest Site:** On the lower limbs of a tree or shrub, hidden among leaves in a shady area. Generally near or against the trunk. Also found in a crotch or fork supported by small branches. May be anchored to a branch with mud.

**Height:** Usually 10–13 feet (3–4 meters) above ground; 2–70 feet (0.5–21 meters) possible.

**Nest:** Nest is made of dead leaves, dried grasses, bark, and moss, with a middle layer of mud. Often contains pieces of white paper or cloth. The cup is molded by the female as she packs the base and sides with her body during the building process. The cup is lined with fine rootlets. Female builds the nest in approximately 3–6 days.

**Eggs:** Usually 3–4, oval to short oval in shape with one end slightly pointed. Smooth, blue-green with no markings.

**Incubation period:** Incubation is done by the female alone for 11–14 days, average of 12 days. If disturbed the incubating female will sink her body lower in the nest and point her bill straight up, revealing her white throat. The male generally stays close to the nest and occasionally feeds the female. The female may start incubating before the clutch is complete.

**Nestling period:** The nestlings are altricial (born naked or with a small amount of down, eyes closed, unable to move or feed themselves) with pale yellow flanges at the gape. The young are brooded by the female. Feather plumes erupt from the sheath at 6–7 days, and the nestlings fledge at 12–14 days. Both parents feed the young and swallow or carry away fecal sacs from the nest.

**Fledgling period:** Young stay near the nest after their first departure. The parents divide the brood after they fledge and continue to feed them for 23–25 days after they have hatched. The young may beg for up to 32 days.

**Broods:** Double brooded.

**Cowbird Parasitism:** A frequent cowbird host; population stability of the Wood Thrush may be threatened by cowbird parasitism. Parasitism rates are greatest in the Midwest.

# CERULEAN WARBLER

## (*Dendroica cerulea*)

### Distribution

**Breeding:** From southeastern Nebraska across the southern Great Lakes region to southern Ontario, southwestern Quebec, and western New England, south to northern Texas, Arkansas, northern Alabama, and northern Georgia. Most abundant in the Cumberland Plateau and surrounding regions; rare east of the Appalachian Mountains.

**Winter:** Primarily on the eastern slopes of the Andes from Colombia and Venezuela through Ecuador to Peru. Relatively few overwinter elsewhere, though a small population exists in the tepui region of Venezuela.

### Breeding habitat

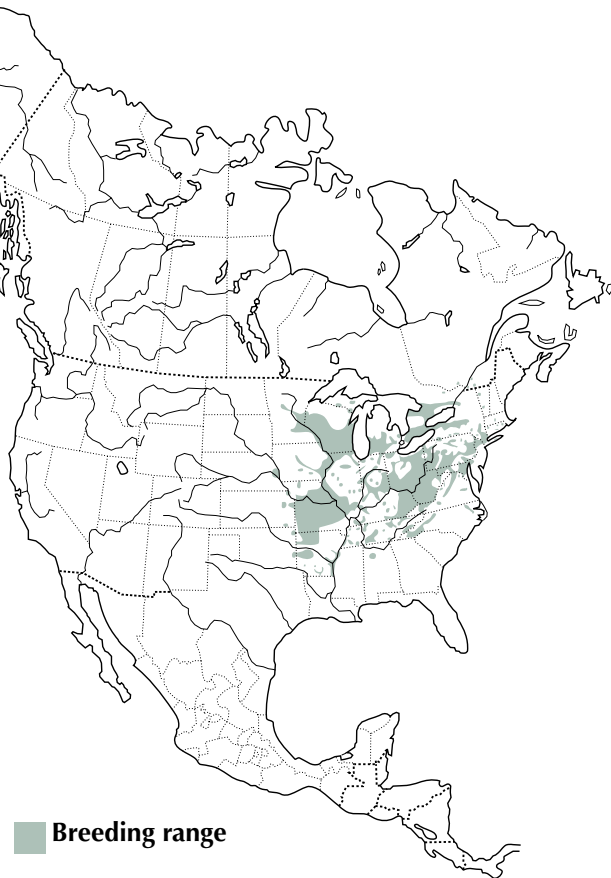
Most commonly found in large, contiguous forest tracts, composed of structurally mature hardwoods with a high, variably closed canopy. Tree size is of primary importance, both height and diameter at breast height (DBH). Birds are found almost always above the midpoint of a tall tree, often in the canopy; and are usually found in stands where most trees fall into the larger DBH classes. Specific forest types vary throughout the species' range and include bottomland hardwood and riparian forests (especially with tall sycamores or cottonwoods), dry ridgetops with mature oaks and hickorys, mesic cove forests with tulip-poplar and other southern hardwoods, red-maple swamps, and lake margins.

### Conservation status

This warbler is of great conservation concern, because of its small overall range and population, its dependence on mature bottomland and ridgetop forests, and rapid deforestation on its tropical wintering grounds. Populations have declined steadily in most of its range, with an overall loss of up to 70% since 1966. Although important breeding sites have recently been identified, and several local studies of habitat have been published, we need a better understanding of precise habitat requirements, area sensitivity, and response to land-use practices, and how these may vary geographically.

### Description

**Male:** Among the smallest of our warblers, shows a short tail, and a plump body. Cerulean blue upperparts, brightest on the head. Back variably streaked



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with black, two white wing bars are prominent. White underparts with a dark blue or black line across the throat, flanks are streaked with blue-gray or black. A lighter blue eyebrow sometimes evident.

**Female:** Somewhat similar to male, except greenish above, washed with blue, especially on the rump, no black streaking on back. The underparts are washed with yellow, the flanks and sides of breast have indistinct dusky streaking. The head shows a bluish-green crown and cheek, setting off a whitish or yellowish eyebrow.

**Juvenile:** Brownish-gray above, underparts dull and buffy. Wings are dusky-gray with two whitish wing bars, may show some gray-green on flight feathers and coverts. Crown brownish-gray, eyebrow buffy-white, eye line is brownish.

### Vocalizations

**Songs:** A fast, buzzy song, rising in three stages, *zeep zeep zeep zeep zizizizi zee!* or *zray zray zray zray-zray zreee!* Can be confused with the song of the Northern Parula, although the terminal, high-pitched buzz of



the Cerulean's song is diagnostic. The song of the Black-throated Blue Warbler also is similar, though slower with fewer notes.

**Calls:** A full, slurred, *chip*; flight note a short, buzzy *dzzt*, or *zzee*.

### ***Foraging strategy***

Systematically hops along the upper branches from the main trunk outward to the smaller, peripheral branches, gleaning the underside of leaves and twigs. Birds almost always occur above the midpoint in large trees, usually in the canopy. Sometimes sallies or hovers for aerial insects.

### ***Diet***

Poorly known, but includes adult and immature insects. One examination of stomach contents indicated that wasps, beetles, weevils, and caterpillars were consumed in varying proportions. Other studies report ants, sawflies, and locusts are also taken.

### ***Behavior and displays***

- Generally hops on small branches and twigs in the forest canopy in lateral or slightly upward direction.
- Usually short, direct flights between trees, occasionally accompanied by fluttering or slow flapping and spread tail that makes the white patches in the tail and on the inner vanes of the primaries and secondaries obvious.
- Breeder birds can be very aggressive: males sometimes attack each other at canopy heights greater than 60 feet (20 meters), meeting in mid-air with audible collision. The birds grapple with each other with bills and feet as they fall, spiraling to the ground with spread wings and tails; similar fights observed between females.

### ***Courtship***

- Poorly studied: courtship displays, mate-guarding, and pre- and post-copulatory displays have not been described.

## ***Nesting***

**Nest Site:** The nest is typically placed at a considerable distance (6–25 feet, 2–7 meters) from the bole of a large tree, usually saddled on a large, lateral branch, sometimes attached to a small protruding twig. Variation in site selection is considerable, particularly with respect to the distance from the bole. Builds in a variety of trees, most often oaks, elms, and American sycamore. More information is needed on nest site preferences, especially the relationship (if any) to canopy gaps.

**Height:** Varies greatly, but most are located from 10–40 feet (3–12 meters), can range to over 65 feet (20 meters).

**Nest:** The shallow cup is built by the female, constructed of finely woven grass, plant stems/fibers, tree bark, mosses, and lichens, the entire structure is bound together on the outside with spider silk. The cup is lined with plant fibers and moss.

**Eggs:** 3–5 ( usually 4) creamy-white, grayish-white or very pale greenish white eggs are speckled, spotted, and blotched with chestnut-red, reddish-brown, or purplish-brown and paler brownish-gray.

**Incubation period:** 12 days, only the female incubates. The male occasionally feeds the female while she incubates.

**Nestling period:** Poorly documented, but both parents feed insects to the young. Initially the male provides the most food, later the female increases her feedings as she devotes less time to brooding young. Young leave the nest at 9–11 days.

**Fledgling period:** Young first move to lower-level vegetation where their parents feed them, and then gradually farther afield as they approach independence.

**Broods:** Single brooded.

**Cowbird Parasitism:** Little information available, but parasitism may be an important factor in the decline of the species.



# WORM-EATING WARBLER

## (*Helmintheros vermivorus*)

### Distribution

**Breeding:** Found discontinuously across the southeastern United States; primarily in the Appalachian and adjacent states, from northeastern Kansas and southeastern Nebraska east to southern New England, south to northeastern Texas, southern Gulf Coast states, northwestern Florida, northern Georgia and South Carolina. Expanding its distribution on the Atlantic and Gulf coastal plains.

**Winter:** Southern Mexico (Oaxaca, Chiapas, Veracruz, and Yucatan Peninsula) south along the Caribbean slope (uncommon on Pacific slope) of Middle America to central Panama. Uncommon on Puerto Rico and St. John, rare on the other Virgin Islands.

### Breeding habitat

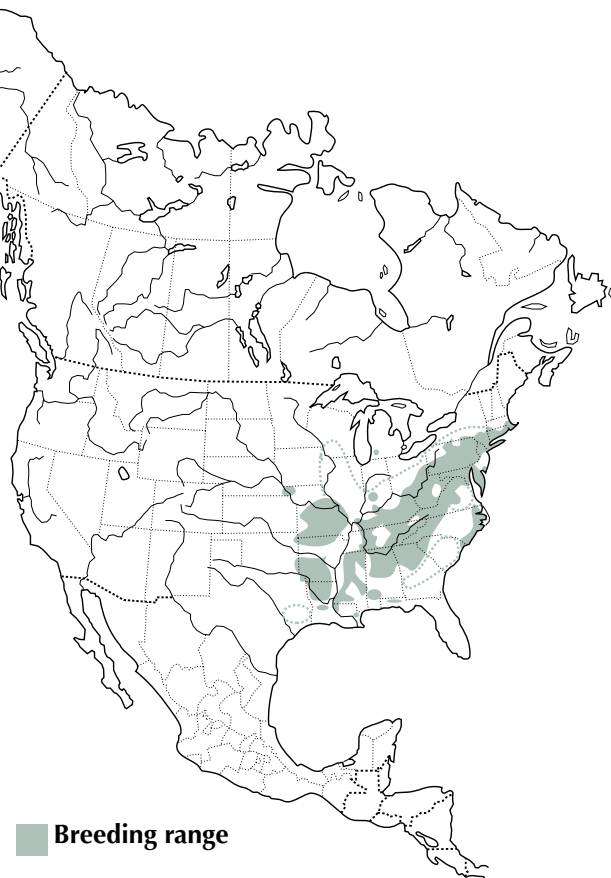
Well-drained upland deciduous forests with understory patches of mountain laurel or other shrubs, drier portions of stream swamps with an understory of mountain laurel, deciduous woods near streams; almost always associated with hillsides. Along the coastal plain, habitats include well-drained oak and oak-hickory forests, flatland white oak forests along river terraces, and drier islands within non-tidal forested wetlands. Most abundant in mature woods but also may be common in young and medium-aged stands. Dense patches of shrubs or saplings may be an important component of territories.

### Conservation status

This warbler is of moderate conservation importance, because of its relatively small breeding distribution, low overall density, association with mature forests, and its even more restricted winter distribution in tropical forests. Populations appear to be stable at present, although declines have been noted in the central Appalachian region. Knowledge of this species' precise habitat requirements, area sensitivity, and response to silvicultural practices will be important for sustaining future populations.

### Description

**Male:** A stocky, short-tailed, and long-billed warbler. The upperparts, wings, and tail are olive brown, underparts are buffy, deepening to a rich pumpkin-buff on the breast. A wide, black stripe extends from the bill back through the eye to the neck, a second black



stripe extends from the bill back above a buff-colored eyebrow, across the sides of the crown to the neck. The crown is buffy.

**Female:** Same as adult male.

**Juvenile:** Brown above and buffy below, stripes on the head are brownish rather than black.

### Vocalizations

**Songs:** The primary song is a simple, dry, high-pitched trill lasting about 2 seconds. Similar to the song of a Chipping Sparrow, but usually shorter and less musical. The Flight song, described as more musical than primary song and somewhat varied, is uncommon and usually given below the subcanopy during agonistic encounters. Only the male is known to sing.

**Calls:** Two types of calls regularly heard, *chip* and *tseet*. A soft chip may be communication between two birds, while a sharp, loud chip is given when a bird is particularly agitated, such as when predator is near nest. A *tseet* is frequently given between members of pair and particularly by birds involved in nesting activities.

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## ***Foraging strategy***

Often seen hopping and climbing on, or hanging from, branches in the shrub and subcanopy layers while foraging in clusters of leaves. Early in season, forages in aerial debris and in suspended dead leaves. As leaves of the canopy and subcanopy trees emerge, individuals begin searching new leaves and opening leaf and flower buds. Often inserts bill into crevice, hole or leaf curl, then opens bill and grabs prey.

## ***Diet***

Early in the season, prey includes arthropods, spiders, and slugs. In late spring and summer caterpillars become important, although other food items are taken as available, including arthropod larvae and adults, and slugs.

## ***Behavior and displays***

- Primarily arboreal, hopping and flitting from branch to branch, occasionally creeping on trunks or large branches, or (rarely) hopping on the ground and among low branches, shrubs, rocks, and large fallen tree limbs or trunks. Does not walk, as reported in earlier accounts.
- Parents will feign injury—dragging tails and wings and chipping sharply—if humans come close to recently fledged young.

## ***Courtship***

- Female solicits by spreading and dropping wings and cocking tail upward, primarily in subcanopy on smaller branches.
- Individuals do not retain same mate in next year, even if same male and female are present.

## ***Nesting***

**Nest Site:** Female selects site, on the ground, often near a stream or wetland. The nest, placed on a hillside or bank of ravine, is usually well hidden under a drift of dead leaves at base of a sapling, against roots of shrubs and trees, beside a rocky ledge or outcrop, or in dense low shrubs such as huckleberry and blueberry.

**Height:** Nest placed on ground.

**Nest:** The female forms a cup of skeletonized, pliable leaves; she may even dampen her breast feathers to moisten the leaves to shape the cup. The lining of a fresh cup is usually burnt-orange to red in color, imparted by moss stems; after 2–3 weeks they darken to mahogany. Additional lining materials include white-tailed deer and horse hair, pine needles, fine grass, and stems of maple leaves.

**Eggs:** 4–6 (usually 5) white to flesh pink eggs are speckled with shades of brown and drab, sparingly or profusely, often with markings wreathed about large end. Some eggs are immaculate. Eggs are laid in May, but will lay a replacement clutch through June if the nest is depredated or the eggs are otherwise inviable. Replacement clutches usually contain 4 eggs.

**Incubation period:** Female incubates for 13 days.

**Nestling period:** The young are brooded by the female only and fed by both parents. Nestling duration is usually 8–9 days, but young may fledge as early as day 5 if disturbed.

**Fledgling period:** Parents remain with the brood in shrub and subcanopy for about 3 weeks after fledging, commonly splitting the brood with 2–3 fledglings joining each parent. Parents use a distraction display when humans and other predators approach fledglings (see “Behavior and Displays” above).

**Broods:** Single brooded.

**Cowbird Parasitism:** A known victim of the Brown-headed Cowbird. Up to 75% of nests are parasitized in some areas.

# LOUISIANA WATERTHRUSH

## (*Seiurus motacilla*)

### Distribution

**Breeding:** Eastern United States, from the southern Great Lakes region (including southern Ontario and perhaps rarely in southwestern Quebec) to southern New England; from eastern Texas across the Gulf states to northern Florida.

**Winter:** Ranges from Central Mexico, although generally absent from Yucatan peninsula, through Central America into northern South America. Also winters in southern Florida, rarely in southern Arizona, the Bahamas, and throughout the West Indies.

### Breeding habitat

Mature deciduous or mixed forests with moderate to sparse undergrowth, near rapid flowing streams. It is therefore often found in hilly terrain or in ravines; occasionally in mixed floodplain and swamp forests in flatter terrain. The key component of this species' habitat is clear flowing water.

### Conservation status

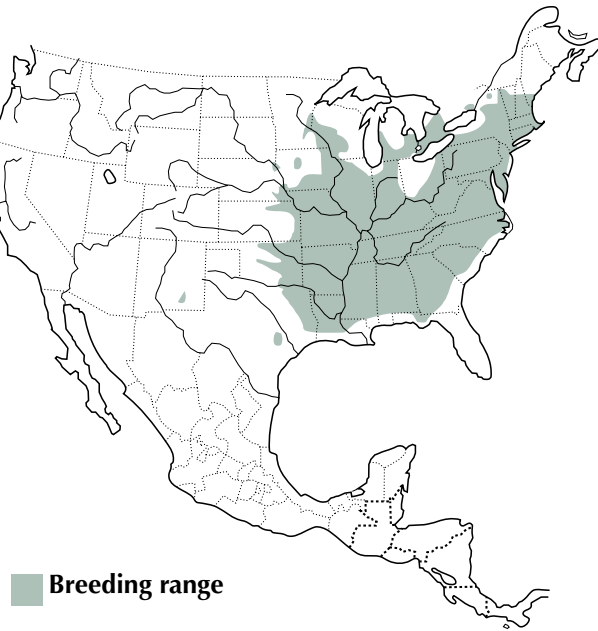
This species is of high conservation importance, because of its relatively small breeding range, low overall density, and dependence on clear forest streams both on its breeding and tropical wintering grounds. Populations of this warbler appear to be stable, although they are difficult to monitor accurately. Precise habitat requirements, especially the characteristics of forest patches surrounding their streamside territories, are poorly known. Effects of forest fragmentation and silvicultural and mining practices also are important to understand when planning for this species' long-term conservation.

### Description

**Male:** A large, heavy-bodied warbler with a short tail and long, heavy bill. Upperparts, including the wings and tail, are dark brown, sometimes with a slight olive tint. Coloration of the underparts consists of dark spotting on a white background with pinkish buff on the flanks. The throat is white and unmarked, a white eyebrow that widens behind the eye is perhaps the most prominent feature. Relatively long legs and feet pink.

**Female:** Same as adult male.

**Juvenile:** Dark brown above, rusty or buffy wing bars. Dull, whitish-buff with olive-brown streaking on the buffy throat, breast, and flanks. Sides of the



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head are mottled with pale buff and olive-brown, a whitish eyebrow is bordered by a dark brown stripe behind the eye.

### Vocalizations

**Songs:** The usual song consists of 2–5 loud, clear, whistled introductory notes that are a slurred upward, *seeup seeup seeup*, followed by a variable complex jumble of short, rapidly uttered phrases. A similar, but much longer and jumbled song is sometimes given.

**Calls:** Call note is a sharp, metallic *chink*, but not quite as metallic as the call note of Northern Waterthrush (distinguishable with practice). Both sexes utter a zizz call during courtship.

### Foraging strategy

Forages primarily on the ground within the boundary of a stream channel, but occasionally searches trees during insect outbreaks. Primarily picks, or takes quick-jab-like strokes directly at food items, or at substrates such as herbaceous plants, leaf litter, soil, rocks, and moss. Other strategies include Leaf-pulls, where the bird grasps a dead leaf submerged in the water, pulls it upward, then flips it over to expose hidden prey; occasionally sallies upward for flying insects or hover-gleans prey from vegetation too high to be reached from a standing position.

## *Diet*

Preferred prey are aquatic insects and invertebrates, also small to medium-sized flying insects. May sometimes eat small fish or small frogs.

## *Behavior and displays*

- Wags entire back half of body and tail up and down while walking in a distinctive tail-pumping motion.
- Some birds roost on exposed roots under overhanging creek banks.
- Territorial neighbors engage in vigorous chases and counter-singing soon after arriving on the breeding grounds, males will continue singing while in pursuit. Neighboring males face each other and begin a Flapping Display by quickly raising wings above their back, then lowering them in a jerky manner.

## *Courtship*

- Birds face each other on the ground and utter zizz call note, sometimes simultaneously. One bird, presumably male, may make sudden, short, erratic flights and land near female. If she flushes, male follows in pursuit until the birds return to same general area. If she does not flush, the female may walk slowly ahead of male with wings partly outstretched and vibrating with her head thrown upward past the vertical. She and the male then copulate.

## *Nesting*

**Nest Site:** Ground dweller. Nests on the ground along stream banks, hidden in the underbrush or among the roots of fallen trees, in crevices or raised sites in tree roots, or in rock walls of ravines over water. Most cavities chosen are hemispherical in shape and approximately the same size as the nest or slightly larger. Cavities in which entire nest is protected above seem to be preferred.

**Height:** Usually in ground cavities along stream banks or under a fallen log, but occasionally nest is built in the root base of an upturned tree

**Nest:** A cup nest consisting of moss, leaves, twigs, inner bark is constructed within the cavity. While both male and female bring nest material, it's uncertain whether male helps in nest construction.

**Eggs:** 4–6, usually 5, eggs are white to creamy-white. Speckles, spots, or blotches of reddish brown are usually concentrated at large end but sometimes scattered evenly over entire egg.

**Incubation period:** 14–16 days depending on the latitude, only by female. Male does not feed female, but accompanies her on foraging bouts.

**Nestling period:** The altricial young are fed by both parents, although the male appears to feed the nestlings more often. The nestlings quietly huddle together until an adult enters nest.

**Fledgling period:** Young leave the nest at ten days after hatching, lured by adult's chip notes to protective shrubs or brush piles. Fledglings can fly six days after leaving nest, and begin feeding on their own at seven days.

**Broods:** Probably single-brooded, since adults often depart breeding territories by July.

**Cowbird Parasitism:** Frequent Brown-headed Cowbird host.

## *Notes*

- Often the first warbler species to arrive on its breeding grounds; singing males arrive as far north as New York by early April.
- Pairs begin searching for a nest site within a day after pair formation. Male enters potential site, turns around several times while tugging at nearby leaves to drag them into cavity, and calls softly to nearby female. If she does not enter, male follows her farther up creek to explore other sites.

# BROWN-HEADED NUTHATCH

## (*Sitta pusilla*)

### Distribution

**Year round range:** Southeastern United States, extending east from southeastern Oklahoma and eastern Texas across central Arkansas, Tennessee, and the Gulf Coast states, to southern Maryland and Delaware, Virginia, south to southern Florida; also found in the Bahamas on Grand Bahama. Highest breeding densities in western South Carolina, western Georgia, central Florida, and southern Mississippi; nearly extirpated from Grand Bahama.

### Breeding habitat

Endemic to the southeastern pine ecosystem, occurring almost exclusively with pines in a wide variety of Southeastern pine forest habitats. Most often uses the loblolly-shortleaf pine forests of the Upper Coastal Plain and longleaf-slash pine forests of the Lower Coastal Plain. Within these forest types, this species is most common in open, mature or old-growth forest, particularly where natural fire patterns have been maintained.

### Conservation status

Because of its restricted overall range, its dependence on mature pine-savannah habitats, and its declining population trend (45 % decline overall since 1966), the Brown-headed Nuthatch is a species of high conservation importance. Healthy populations of this species occur in association with the endangered Red-cockaded Woodpecker. Understanding the effects of habitat fragmentation and large-scale silvicultural practices are important to its long-term conservation.

### Description

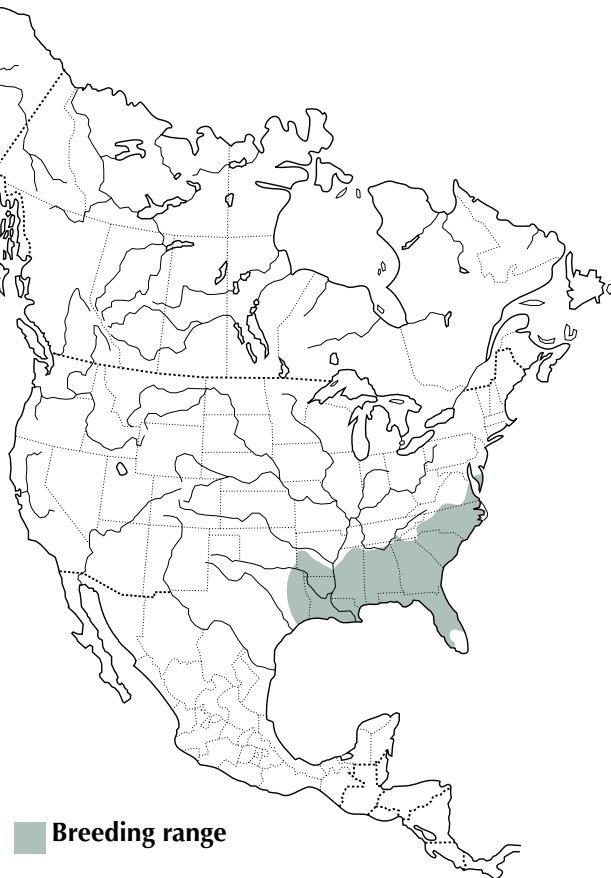
**Male:** A small nuthatch with a brown cap and narrow, dark eyeline; a white spot on the back of the neck is visible at close range. The wings, back, and tail are grayish; the underparts are buffy white.

**Female:** Same as adult male.

**Juvenile:** Same as adult male.

### Vocalizations

**Songs and calls:** As most vocalizations are given in a variety of circumstances, distinctions between songs and calls are unclear. There are four types of vocalizations:



**Breeding range**

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**“Rubber Ducky” vocalization:** A high-pitched, squeaky, wheezy two-syllable sound, *tyah-dah* or *chee-da*, strikingly like a toy rubber duck. Carries long distances, and given in a wide-array of circumstances.

**Serial vocalization:** A rapid series of notes, softer than Rubber Ducky Vocalization, but more emphatic. Most often given when birds are fairly close together, either during times of apparent excitement or normal foraging.

**Single-note vocalization:** Extremely soft single notes such as *tip*, *pik*, *tut*, or *dep*. Often used as a contact call among individuals.

**“Schweeee” vocalization:** A soft, thin, airy, and harsh *schweee*, *schweee*, *schweee*; given by birds soliciting food from mate.

### Foraging strategy

Forages actively among pine trees throughout daylight hours, methodically seeking out arthropods on or underneath tree bark in summer. Primarily hops



along tops of limbs in zigzag fashion, peering down around limb first on one side, then on the other. Most often moves distally along limbs, and may climb up or down trunks. Inspects bases of needle clusters and bracts of cones for seeds and arthropods. After finding a seed or large insect, the bird flies or hops to a nearby limb and begins feeding.

## ***Diet***

Takes a wide variety of insect prey during warmer months, including bark-dwelling cockroaches, spiders, beetle larvae, and insect egg cases; mainly eats pine seeds from cones during colder months.

## ***Behavior and displays***

- The weak and slow flight, with a discrete series of wing-beats, results in a flight pattern of shallow dips.
- Birds roost at night either in cavities or on pine branches out in the open.
- Interspecific interactions may include supplanting individuals from perches, attempting thefts of food, in-flight pursuits, and fighting with physical contact. In one instance, a fight between two birds resulted in one bird hopping atop the other and pecking viciously at its back and tail until they both tumbled through the air.
- Immature males from previous nesting attempts may help at the nest, assisting with cavity excavation, nest construction, nest sanitation, and feeding of nestlings, fledglings, and the female at the nest. They may also chase intruding birds from the territory.

## ***Courtship***

- Female performs “wing-quivering displays” and emits begging calls as the male brings food.
- Both sexes may quiver wings and twitter at nest site, although usually only female begs. Early in the breeding season, female is mate-guarded by male as she forages from tree to tree.

## ***Nesting***

**Nest Site:** A primary cavity nester; snags for nesting occur naturally in southeastern pine forests because of fire, in open areas adjacent to pine woods, or in wet pine savanna or ponds because of flooding. Artificial sites used include nest boxes, fence posts, telephone poles, and wooden pilings in residential or rural areas.

**Height:** Nest heights are among the lowest of any North American cavity nester, generally between 2–10 feet (0.5–3 meters), but can range up to 90 feet (30 meters).

**Nest:** Places a bed of soft materials, including bark shreds, grasses, forbs, wood chips, hair, feathers, pine seed wings, and cocoon fibers, inside a cavity. Usually excavates nest cavity in dead wood, but may reuse an old cavity, enlarge an existing cavity created by other nuthatches or woodpeckers, or use an artificial nest box. Helper may assist in nest construction.

**Eggs:** 3–9, usually 5–6, white, light creamy, or buffy eggs marked with reddish brown, vinaceous cinnamon, purplish, or lavender. Markings are either evenly distributed as fine dots or concentrated at larger end as blotches.

**Incubation period:** 13–15 days, incubation by female only, though the male may regulate incubation rhythm by calling female off nest. Male continues to feed mate at nest site during incubation, additionally, helper may feed female at nest.

**Nestling period:** For the first few days, the female broods roughly half the time, then only sparingly. Both parents attend the young, bringing small, soft-bodied arthropods as no food is regurgitated; helper may also feed nestlings and aid in nest sanitation. Young leave nest after about 18 days.

**Fledgling period:** Fledglings are dependent on food 2–4 weeks after leaving the nest, so parents feed young for another 24–26 days, a helper (young male) may also tend young. Family groups remain together throughout summer, and may merge with other family groups.

**Broods:** Second broods sometimes occur.

**Cowbird Parasitism:** Not known to occur.



# RED-HEADED WOODPECKER

## (*Melanerpes erythrocephalus*)

### Distribution

**Breeding:** Widespread, but patchily distributed across the eastern United States, west to the edge of the Great Plains in New Mexico, Colorado, Wyoming, and Montana.

Also found in extreme southern Canada from Saskatchewan to New Brunswick. Most common in the mid-western and Gulf Coast states.

**Winter:** Regularly through the southern two-thirds of the breeding range, rarely to the northern limits of the breeding range.

### Breeding habitat

Open woodland, especially with beech or oak, and open situations with scattered trees, e.g. parks, cultivated areas, gardens, groves, farm country, orchards, and shade trees in towns. Generally avoids unbroken forest, favoring open country or at least clearings in the woods. Also found in pine-savannah, pine-oak barrens, forested wetlands or flooded timber, and timber stands treated with herbicides or burned.

### Conservation status

This species is of high conservation concern, primarily because of precipitous population declines nearly throughout its range. Overall, a 50 % loss has been noted rangewide since 1966. Reasons for this decline are not clear, and understanding this species' precise habitat relationships and sensitivity to silvicultural and other land-use practices will be important for conserving future populations.

### Description

**Male:** Bright red head and neck; white breast, belly, rump, and vent; black back, tail, and wings with prominent white secondaries visible in flight and at rest.

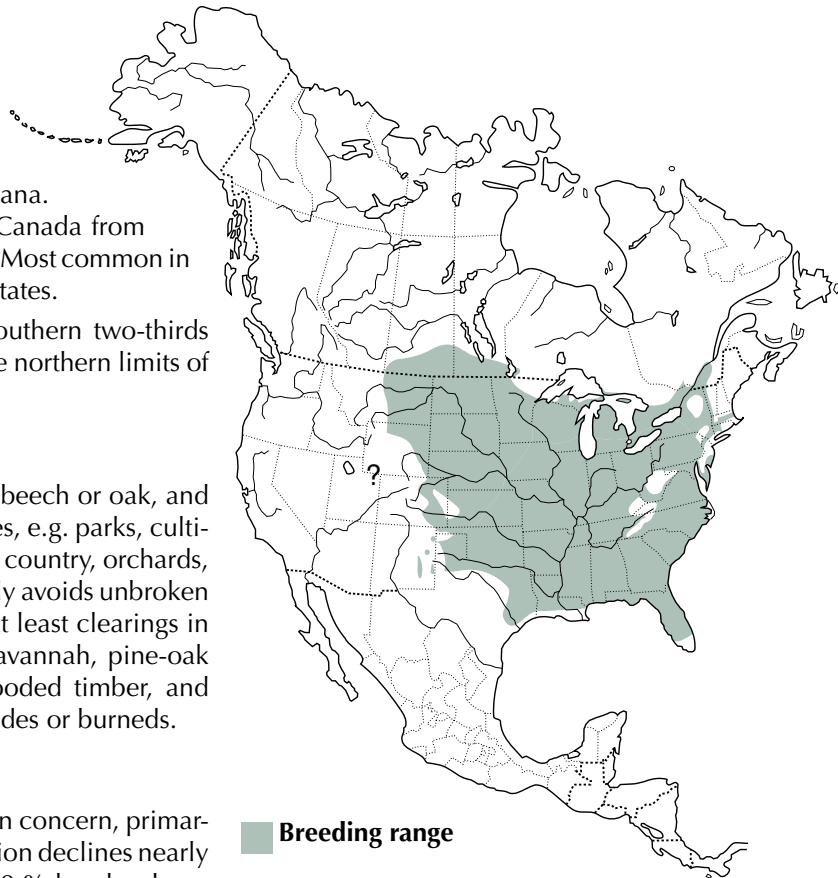
**Female:** Same as adult male.

**Juvenile:** Mottled brown head and neck; white breast, belly, and rump variably marked with brown streaking; dark brown back and upperwings; white secondaries are broken by brown lateral bars; tail is dark brown.

### Vocalizations

**Drum:** advertises and defends territory by drumming on tree-trunk or snag; drum is fairly short, weak, and slow compared with other woodpeckers.

**Calls:** A loud *churr-churr* and *yarrow-yarrow yarrow*.



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Contact call a variable, wheezy *queeah* or *queerp*; weaker and less vibrant than Red-bellied Woodpecker. In flight a low, harsh *chug* like Red-bellied Woodpecker. Close contact call is a gentle, dry *rattle krrrrr*.

### Foraging strategy

An opportunistic forager, often seen on tree trunks and major limbs, but less likely to drill for food than other woodpeckers. Flies out from a perch to catch insects in the air or on ground; also gleans insects from bark and foliage. Gathers acorns, beechnuts, and other nuts in fall, storing them in holes and crevices, then feeding on them during winter.

### Diet

A wide variety of food items has been documented, including wood boring and flying insects, fruit, corn, eggs and nestlings of small birds (e.g. Purple Martins and bluebirds), small vertebrates (e.g. mice), seeds; may be attracted to a backyard with suet, sunflower seeds, cracked corn, and bread.

### Behavior and displays

- Male establishes and advertises territory with calling and drumming.
- Displays, including aggressive ones, involve bowing head and spreading wings.
- Both sexes regularly use highly aggressive “bobbing” or “bowing” displays, with head pointed forward, wings drooped and tail erect at an angle.
- When excited around nest cavity, performs bowing display and also “wing-spreading” and “tail-spreading” displays.

## *Courtship*

- Courtship activities focus on the nest site and include a horizontal pose with neck stretched forward, plumage sleeked, shoulders humped.
- Male and female spend much time playing “hide and seek” around dead stubs and telephone poles, with individuals on opposite sides alternatively looking at each other around one side and then the other. Also often chase one another from tree to tree.
- Copulatory behavior, like courtship, is closely associated with the nest limb and has 3 basic components: “mutual tapping,” “reverse mounting” (female on flutters onto male’s back), and “copulation.”

## *Nesting*

**Nest Site:** The nest cavity is usually in a bare dead

tree or limb. The male’s winter roosting cavity may be used, or a new cavity may be excavated; both adults excavate (mostly the male), the female usually inspects the nest cavity.

**Height:** Ranges from near ground level to over 100 feet (30 meters).

**Nest:** No nest construction other than wood chips left in the bottom of the cavity.

**Eggs:** 3–8, usually 4–5, white eggs are laid one per day.

**Incubation period:** Incubation by both sexes, with male incubating at night, lasts about 14 days.

**Nestling period:** Both parents feed the young; nestlings leave the nest 27–31 days after hatching.

**Fledgling period:** Both parents feed recent fledglings; they follow the parents until chased away about 25 days later. Pairs may start on a second nesting attempt while still feeding fledglings from the first. The fledglings may be driven away if the adults begin to raise a second brood.

**Broods:** 1 or 2 broods per year, commonly two broods in the southern portions of the breeding range.

**Cowbird Parasitism:** Sometimes parasitized by the Brown-headed Cowbird, but, as the Red-headed Woodpecker is a lousy foster parent, the parasite is almost always unsuccessful.

## *Notes*

- In resident birds, male’s winter territory may become breeding territory.
- Second brood may be raised in same nest but more often in new cavity.

# RED-SHOULDERED HAWK

## (*Buteo lineatus*)

### Distribution

**Breeding:** Western birds occur west of the Sierran Divide from northern California south to northern Baja California. In the east, widespread from the eastern edge of the Great Plains to Atlantic Coast, south to the Gulf Coast and Florida; a very scarce breeder in eastern and central Mexico.

**Winter:** Sporadically throughout the breeding range in eastern North America, but primarily from eastern Kansas to southern New England south to central Mexico; most numerous in the Gulf coast states and Georgia. California population is present year round.

### Breeding habitat

Varies from bottomland hardwoods and riparian areas to upland deciduous or mixed deciduous-conifer forest, and almost always includes some form of water, such as a swamp, marsh, river, or pond. In the west, sometimes occurs in coniferous forests, and has been expanding range of occupied habitats to include various woodlands, including stands of eucalyptus trees amid urban sprawl.

### Conservation status

The Red-shouldered Hawk is a widespread raptor that is found in many different forest types throughout its range. It is considered a species of special concern in many northern states and in Canada, although populations appear to be increasing in many areas. As a top predator, conserving populations is important, and this will require knowledge of precise habitat requirements, sensitivity to fragmentation and disturbance, and how these vary across the species' range.

### Description

**Male:** A medium-sized, slender *Buteo* with long legs and a long tail; larger than the Broad-winged Hawk and smaller than the Red-tailed Hawk. Upperparts are dark with pale spotting, rusty-reddish feathers on the wing create the distinctive shoulder patch. The underparts show rusty to rufescent barring, some races appear much paler, other races show brown streaks on breast. In flight, underwing pattern shows a translucent, pale crescent near the black wing tips and appears two-toned. The tail has several wide, dark bars; the intervening narrow stripes and the tip of the tail are white, and there is variation in the number



Breeding range

of tail bars among adults and juveniles. On perched birds one may observe that the legs and feet are yellow, as is the cere (skin above the bill); the eye is dark.

**Female:** Plumage is the same as adult male; slightly larger than male, although there is considerable size overlap.

**Juvenile:** Lacking the extensive rufous coloring of the adults, first year birds are variably streaked with brown underneath, lack the red shoulder but may show some reddish speckling above, but do show a similar tail pattern. Legs and feet are yellow, as is the cere, but the eye is light brown.

**Note:** Considerable variation among individuals is possible, especially between California, eastern, and Florida birds; this variation exists among all age classes.

### Vocalizations

**Calls:** The most common call is a *kee-aah*, with the accent on first syllable, and the second extended with a falling inflection. Males gives a single or

repeated *kip* when bringing prey to the nest, the female responds similarly; nestlings give a chirping call. Other Vocalizations are variants of the *kee-aah* or *kip*. Note: the Blue Jay is notorious for mimicking the cry of the Red-shouldered Hawk, and often hard to distinguish.

### ***Foraging strategy***

A diurnal predator, generally hunts from a perch in the forest canopy by dropping on prey sighted below. Birds are caught by surprise by low, direct, accipiter-like flight; may fly from a forest perch and snatch prey from water surface, may hunt from ground by catching small mammals as they emerge from burrows. Suitable perches, with heights ranging from 6–15 feet (2–4 meters) above ground, include poles, fences, hay piles, and trees

### ***Diet***

Primarily take small mammals, birds, reptiles, and amphibians. Less often carrion, grasshoppers during outbreaks; crayfish are also important in some regions.

### ***Behavior and displays***

- Soaring flight with wings and tail outspread when circling above territory; flaps occasionally, often fast like an accipiter.
- Aggressive response increases from incubation through nestling stage.
- Interspecific intruders near nests are chased and may be attacked.
- Intruding conspecifics are subject to calling, stooping on perched bird, chasing flights, occasionally physical contact has been observed.
- Reaction to human intruders near nest ranges from quietly leaving nest to perching nearby and calling, circling over nest, stooping on intruder, and even striking intruder with claws open.
- American Crows and Red-shouldered Hawks may chase each other when attempting to steal food from each other; they also jointly mob Great Horned Owls.

### ***Courtship***

- Aerial nuptial displays are impressive, including “high-circling” and “sky-dancing,” both extremely vocal performances.
- Sky-dancing consists of one individual, presumably the male, riding a thermal upward, crying as it circles. Then it drops into a steep dive with folded wings, pulling up and then shooting upward again. Neighboring pairs often join in, with as many as ten birds involved. The sky-dance can be immediately followed by copulation, which occurs repeatedly and over considerable time.

### ***Nesting***

**Nest Site:** Usually nests below the canopy in deciduous or mixed forest, often near some form of water, e.g. a pond, stream, or swamp. In deciduous trees the nest is typically more than halfway up tree in a crotch of main trunk; in conifers, nests are usually built against the main trunk where a whorl of other branches meet the trunk.

**Height:** Typically from 30–60 feet (9–20 meters), but can range from 4–115 feet (1.5–35 meters).

**Nest:** Composed mostly of live or dead sticks, dried leaves, strips of bark, Spanish Moss, and lichens; the inner cavity is lined with finer shreds of inner bark, mosses, lichens, and sprigs of conifer are added at egg-laying.

**Eggs:** 1–6, usually 2–4, eggs laid between January–June, mostly during March–April.

**Incubation period:** Incubation begins with the laying of the first egg, and is performed by both sexes, but mainly the female who is fed by the male. Young hatch asynchronously, around day 33.

**Nestling period:** The semi-altricial young are inactive, becoming active at about 10 days. Nestlings are thickly covered with long, soft, silky down and vary in size due to asynchronous hatching. Feathering begins about 2 weeks. Nestlings vary in size. Young leave the nest at 5–6 weeks, first flight may not occur until day 45 or older.

**Fledgling period:** Parents supply food to young for about 8–10 weeks after fledging.

**Broods:** Single brooded.

# ACADIAN FLYCATCHER

## (*Empidonax virescens*)

### Distribution

**Breeding:** From southeastern South Dakota east across southern Great Lakes region to southern New England, south to southern Texas, Gulf Coast, and central Florida, west to central Kansas; in Canada, restricted to southwestern Ontario. The highest nesting densities are in the Cumberland Plateau and in Virginia and West Virginia.

**Winter:** Central and northern South America, specifically on Caribbean slope of Nicaragua, both slopes of Costa Rica and Panama, northern and western Colombia, northern Venezuela, and western Ecuador.

### Breeding habitat

Inhabits large tracts of mature, mesic, forests with shrubby understory, generally near a stream or ravine. Forests are typically deciduous, but include hemlock ravines, cedar swamps, pine-oak woodland, and conifer plantations. Often associated with streams or swamps within larger dry forests.

### Conservation status

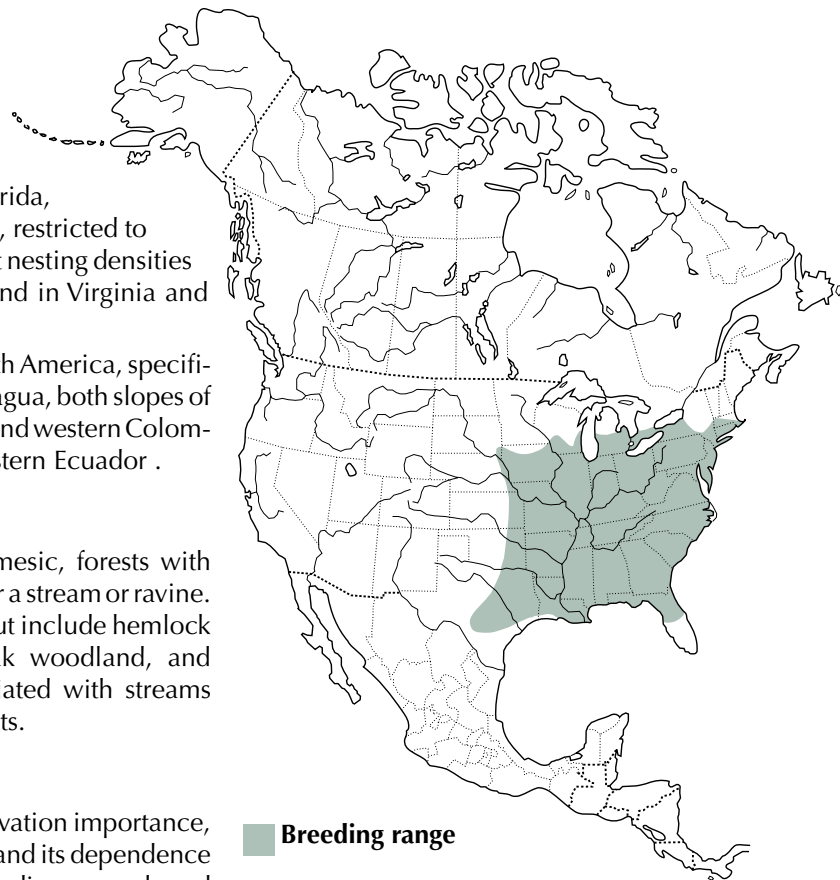
This species is of moderate conservation importance, because of its overall low density, and its dependence on mature forests both on the breeding grounds and the tropical wintering grounds. This species is still common, with overall stable populations at present, although steep declines have been noted in Florida and the southern Appalachian. Understanding its relationships with forest fragmentation and structure, and the effects of various silvicultural practices, will be important for conserving future populations.

### Description

**Male:** A small, nondescript flycatcher, very difficult to separate by sight from other *Empidonax* flycatchers. Upperparts are olive-green with two whitish wing bars; underparts variable, but commonly pale grayish throat, pale olive wash across breast, yellow belly and undertail coverts. Bill is wide (compared with Least Flycatcher), with a black upper mandible, yellow or pinkish lower mandible; thin yellowish white eye-ring present.

**Female:** Same as adult male.

**Juvenile:** Very similar to adult, except upperparts brownish-olive, with feathers edged in buff, giving scalloped appearance; wing-bars dark buff; underparts



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with olive wash on breast

### Vocalizations

**Songs:** An explosive, high, *spit a KEET*, or an emphatic *PEET-sah*, usually accented on first syllable. More variable song composed of these phrases may be heard at dawn.

**Calls:** Most common call is a high *pweest*, like a squeeze-toy; occasionally also a low, slurred *wheew*. Also gives a flicker-like *ti ti ti ti ti*.

### Foraging strategy

Often found perched in deep shade, less than 20 feet (6 meters) from the ground, and well beneath the canopy of foliage. Similar to other flycatchers, sallies and hovers at foliage for insects often from a shaded perch near the nest; occasionally gleans insects and berries from bushes.

### Diet



Mostly flies, also mosquitoes, small moths, flying ants and small beetles. Also known to eat berries such as blackberries and raspberries.

### ***Behavior and displays***

- Generally very inconspicuous bird, must be sought for to be seen.
- More lethargic than other *Empidonax* flycatchers, doing very little flicking of the wings or tail except when excited. Often perches with the wings somewhat drooped.
- When the birds are building nests or incubating their eggs they are always extremely shy, and leave the nest long before a person has approached within twenty-five yards of its location.

### ***Courtship***

- Courtship mostly of erratic, swift chases; male often hovers above perched female.

### ***Nesting***

**Nest Site:** Site selected by female, tree species used include beech, dogwood, and witch-hazel, but also nests in oak, hickory, maple, basswood, cherry, red pine, white pine, Norway spruce, box elder, common buckthorn, American elm, and white mulberry. The nest is usually placed on a fork of a horizontal branch well away from the main trunk, often over water, a ravine, or other clearing. Occasionally nests from previous years are re-used.

**Height:** Ranges from 6–30 feet (2–9 meters).

**Nest:** A frail, saucer-shaped, shallow basket is built

by the female and consists of fine, dry plant stems, plant fibers, tendrils, catkins, Spanish moss (in south), and swung hammock-like between horizontal twigs of a slender limb. Invariably long streamers of dried grass, grapevine, fibrous material hang below nest 1–2 feet (0.3–0.6 meters), giving it misleading trashy appearance from below. Cup is lined with grass stems, fine rootlets, plant down, spider webs.

**Eggs:** 2–4, usually 3, buffy eggs.

**Incubation period:** Female incubates 13–14 days; male rarely feeds incubating female.

**Nestling period:** Young are altricial and downy; skin pinkish; down sparse and white. Both parents tend to young; female broods. Nestlings fledge at 13–15 days.

**Fledgling period:** After leaving nest, fledglings are fed by parents for about 12 days. Fledglings fed only by male when female begins incubating second clutch.

**Broods:** Often double brooded, except at northern edge of range.

**Cowbird Parasitism:** Common host of Brown-headed Cowbird.

### ***Notes***

- The only *Empidonax* in the southeastern lowlands in summer.

# YELLOW-THROATED VIREO

## (*Vireo flavifrons*)

### Distribution

**Breeding:** Range extends from the eastern border of the Great Plains to the Atlantic Ocean, from as far north as southern Canada to the Gulf Coast, including central Texas.

Particularly high abundances occur in the heavily forested Cumberland Plateau and Blue Ridge Mountains, specifically West Virginia and Virginia.

**Winter:** Mainly in Central America, but range extends from southern Florida and southern Texas (rare), south through central Mexico to northern South America (the mountains of Colombia, northern and western Venezuela), occasionally the Caribbean islands of Trinidad, Tobago, Cuba and the Bahamas.

### Breeding habitat

Inhabits mature woods of open deciduous forest, riparian woodland, tall floodplain forest, or lowland swamp forest. Occurs less frequently in medium-aged forests or pioneer stands, mixed forest; found occasionally in orchards, groves, roadside trees. Generally requires a high, partially open canopy, also prefers woods with an intermediate tree density or basal area. Apparently has a relatively low tolerance to forest fragmentation, though this may depend on forest quality and proximity to other forested areas.

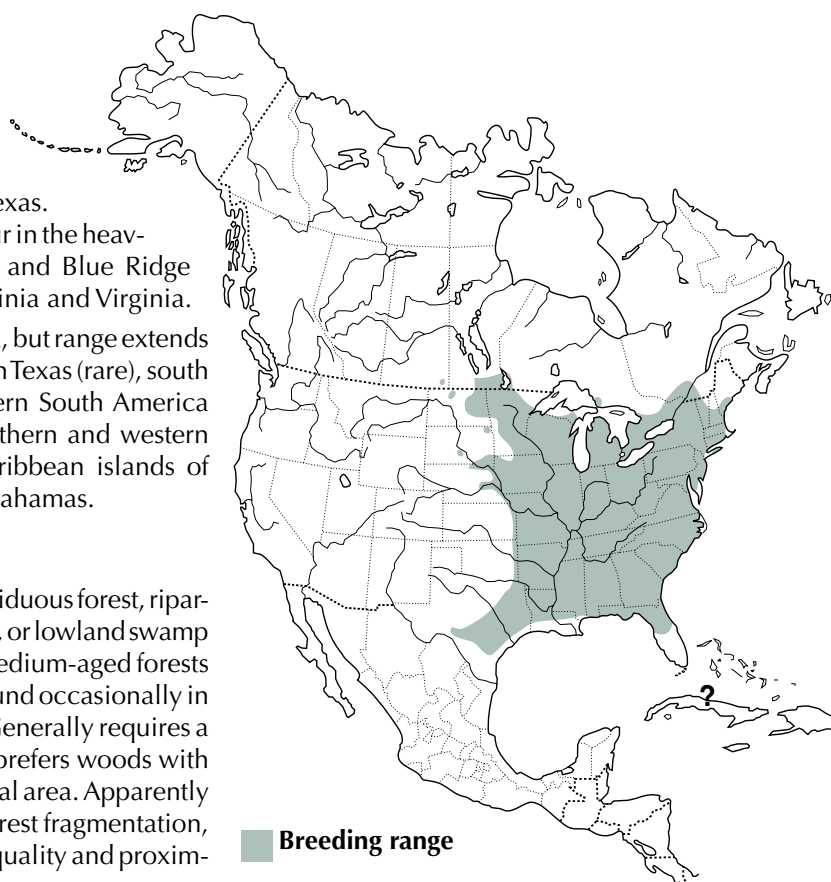
### Conservation status

This vireo is of moderate conservation importance, because of its relatively small breeding Distribution, its low density throughout its range, its dependence on mature deciduous forests, and its restricted winter Distribution in tropical forests of Middle America. Populations are stable or increasing in many areas, but declines are evident in the southern Appalachians and northern New England. Understanding this species' tolerance of forest fragmentation and change to forest structure due to silvicultural practices will be important for sustaining future populations.

### Description

**Male:** Large-headed with a heavy bill and short tail. Male has a brilliant yellow throat, breast, and yellow "spectacles." Its belly and two wing bars are white. The upper parts are olive-green with a contrasting gray rump.

**Female:** The female is similar to the male, but slightly paler.



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**Juvenile:** Fledglings are similar to adults, but paler.

### Vocalizations

**Songs:** Primary song is only given by males and consists of a variable series of discrete phrases separated by pauses, *ahweeo*, *eeyay*, *ayo*, *away*, *oweeah*, *eeoway*. Each phrase is short, relatively low pitched, and buzzy or harsh in quality. Often sings from the nest and is difficult to locate.

**Calls:** Scolding calls are harsh calls with syllables of unstructured sound, described as a repeated series of *chi-chi-chi* or *cha-cha-cha*. Contact calls audible only at close range; of short duration and pure tone; may be described as quick *oui* or *wit* sounds. A trill is formed of series of 4–14 repeated syllables, rising slightly in pitch in middle and slowing slightly toward end.

### Foraging strategy

A slow, methodical forager in tree canopy or mid-story, most active early-midmorning and late afternoon–evening. Typically searches nearby substrates from one location before hopping or making short flight to new

location. Upon observing prey, will hop or fly up to 6 feet (2 meters) to within striking distance, indicating that it makes visual search for prey over relatively large distances.

### ***Diet***

Consumes wide variety of arthropods, the most important are larvae and adults of butterflies and moths, stinkbugs, assassin bugs, scale insects, leafhoppers, a wide variety of beetles, flies, bees and wasps. May take fruits and seeds in late summer, fall, and winter.

### ***Behavior and displays***

- Typically moves slowly and deliberately through vegetation.
- Flight is direct, and usually only short distances from tree to tree or branch to branch after searching about for a short interval from stationary position.
- Hops only short distances along branches to secure food, then wipes bill after feeding activity.
- The male occasionally sings at all hours throughout the summer and frequently sings on the nest.

### ***Courtship***

- The male searches for nest sites and may make barest beginnings of nest, which are used as display sites when female arrives.
- Male uses primary song and calling sequence until female comes near, then switches to pre-copulatory-like displays and/or ritualized “nest building” display: the male stands over the nest site, head lowered but no nest material in beak, moving head in a way that only vaguely resembles actual nest-building.
- The male also performs a “fluffing” display: following each flight, male pauses to fluff his head and body feathers slightly, and he maintains that fluff as the pair forages.

### ***Nesting***

**Nest Site:** Selected by male (see “Courtship” above), typically in the upper crown of trees, most often near center, but occasionally out to periphery. Often suspended between forks of slender branches, usually those growing laterally from a larger upright limb, and placed within the tree canopy.

**Height:** Typically 25–45 feet (8–13 meters) from the ground, ranges from 3–80 feet (1–24 meters).

**Nest:** The nest is a well-made deep cup of grasses and strips of bark, woven together with spider silk and plant down and lined with fine grasses. The rim is incurved, the outside decorated with moss and lichens. Male does most of the building on the first day, but his role declines thereafter.

**Eggs:** 3–5 (usually 3–4) white to cream-white eggs are lightly spotted with shades of brown, mostly at the larger end.

**Incubation period:** 14–15 days, male and female incubate.

**Nestling period:** Both parents share in feeding and brooding of young, which depart nest at 14–15 days.

**Fledgling period:** Both parents tend to the fledglings, which are dependent for about four weeks, but remain with parents until August. Parents feed any of their young for a few days, but soon brood is split, with each parent feeding half. Parents separate within 1 week of fledging, sometimes reuniting for brief periods at later dates.

**Broods:** No information.

**Cowbird Parasitism:** Commonly parasitized by the Brown-headed Cowbird, with as many as 50% of nests affected. Known to bury cowbird egg in nest bottom, or to desert nest, but typically accepts cowbird eggs.

### ***Notes***

- Thought to be entirely monogamous. Pairing is rapid, and involves courtship rather than aggressive behavior.

# NORTHERN PARULA

## (*Parula americana*)

### Distribution

**Breeding:** Eastern United States and Canada; northern and southern portions of range separated by a gap where this species is rare. Breeds in the spruce and northern hardwood forests of Canada from Manitoba east to the Maritime Provinces, south to the northern Great Lakes states, the Adirondack Mountains and Northern New England. Also a common breeder over the entire Southeast, from eastern Texas, the Gulf Coast states and most of Florida, north to southeastern Nebraska, Iowa, and central portions of Illinois, Indiana, Ohio, Pennsylvania, and New Jersey. Recently expanding (regaining former range), at least along Atlantic Coast between New Jersey and Maine.

**Winter:** Winters from Veracruz and Oaxaca south through Mexico to Costa Rica, also in Florida and the West Indies.

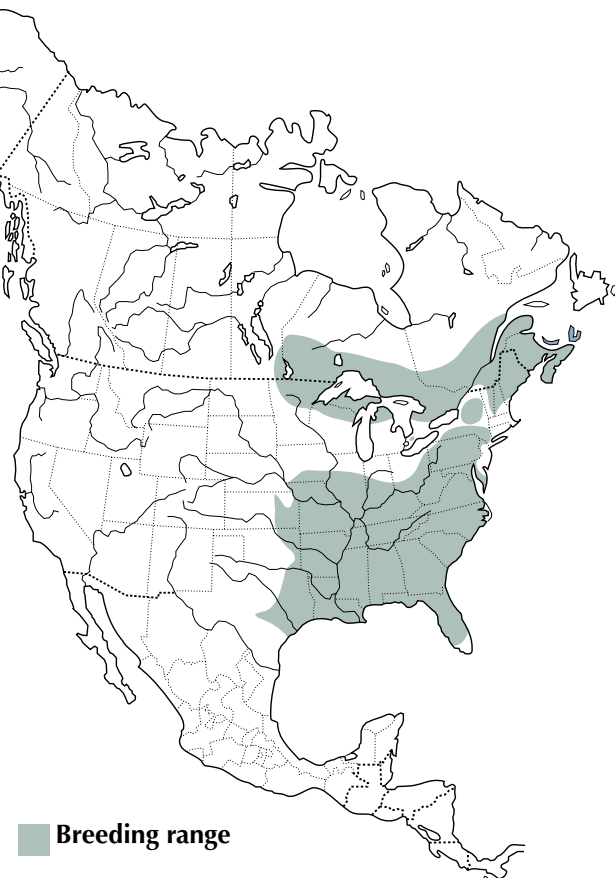
### Breeding habitat

Southeastern populations are primarily associated with bottomlands and swamps, where they inhabit mature coniferous and deciduous forests in which Spanish moss is an important component of the nesting habitat. In the north, this species is found in mature spruce and mixed northern hardwood forests and bogs with abundant bearded lichens (*Usnea*). Only occasionally occurs in woodlands without moss or lichens. They are especially abundant in the windswept, spruce-covered islands off the Maine coast and in the Maritime provinces, as well as in the bottomland hardwood and cypress forests of the southeastern coastal plain and the lower Mississippi Valley.

### Conservation status

This warbler is of moderate conservation importance, primarily because of its dependence on mature forests with healthy epiphyte growth. Although the overall species population appears to be stable, trends vary from region to region. Significant declines have occurred in the Mississippi Valley and southern coastal plains, whereas northern and Appalachian populations have increased. Knowledge of precise habitat requirements and sensitivity to forest fragmentation will be important for sustaining future populations.

### Description



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**Male:** Small and compact warbler with a noticeably short tail. Upperparts are primarily bluish with a bronze-green patch on the back. Bluish wings show two prominent white wing bars. Throat and breast yellow, with a chestnut and black band across the breast. A broken white eye ring and black lores stand out on the bluish face.

**Female:** Generally the same as the adult male, but with less blue and more gray on the upperparts; only a wash of chestnut on the yellow breast.

**Juvenile:** Upperparts are grayish with a wash of olive-green on the back and wing, white wing bars. Underparts may show a little yellow on the chin, but normally only a grayish breast and whitish belly are notable. A dark gray line running through the eye borders a gray-white eyebrow.

### Vocalizations

**Songs:** The most common song is a simple, rising, buzzy trill ending in a short, separated note.

A less frequent and more complex song consists of a slower series of buzzy notes. Singing is almost

exclusively by the male, but there is at least 1 record of a singing female.

**Calls:** Males and females both give a clear, sweet, *chip* and an downward inflected *tseep*. Nestlings and fledglings apparently give 2 types of begging calls.

### ***Foraging strategy***

Most commonly gleans tips of foliage, small twigs, and branches high in the canopy; occasionally also hovers or hangs upside-down on foliage, and sallies for aerial insects. Similar techniques employed in both coniferous and deciduous forests.

### ***Diet***

Preferred prey are spiders and caterpillars, also takes beetles, moths, ants, wasps, bees, flies, locusts, scale insects, plant lice, lacewing flies, and mayflies.

### ***Behavior and displays***

- Physical conflicts can take the form of tightly whirling aerial “dogfights” and chases, accompanied by vigorous chipping.
- Observed to wipe bill vigorously on either side of a branch, even when not feeding at the time, perhaps as displacement activity.

### ***Courtship***

- No information.

### ***Nesting***

**Nest Site:** Typically suspends cup nest near the tip of a tree limb in hanging bunches of epiphytic growth, either Spanish moss in the southern parts of range or beard moss or lace lichen in north; thus, nesting sites are most often in areas where these epiphytes grow. Preferred nesting sites are usually near water, e.g., river bottoms, sloughs, swamps.

**Height:** 10 feet (3 meters) is average, but can range from 6–100 feet (2–30 meters) above the ground.

**Nest:** The nest is constructed mostly of moss or lichen, generally in an area already covered in moss or lichen. The adults conceal the nest with the same materials the nest is constructed with. The inside is usually lined with the same epiphyte fibers collected by the adults, though the bowl is sometimes lined with hair, fine grasses, pine needles, or plant down.

**Eggs:** Averages 3–5 (range 2–7) white to creamy white eggs that are variably speckled and spotted with chestnut red, purplish red, reddish brown. Only the female incubates, and she may start before clutch completion.

**Incubation period:** 12–14 days, only the female incubates.

**Nestling period:** Hatching is asynchronous, and the hatchlings are altricial with closed eyes, naked except for white down on head and back. Nestlings are predominantly fed and brooded by the female, although male does occasionally feed.

**Fledgling period:** 10–11 days after hatching the young leave the nest still unable to fly. Fledglings beg by holding body in a crouch, drooping and vibrating wings and tail, throwing back head with mouth agape, vocalizing loudly and constantly near the parents. Female does most of the feeding while the male sings. Time to independence not known.

**Broods:** Probably single brooded.

**Cowbird Parasitism:** An uncommon Brown-headed Cowbird host, probably owing to the closed structure of the nest. There are few, but widespread, records of brood parasitism.



# PROTHONOTARY WARBLER

## (*Protonotaria citrea*)

### Distribution:

**Breeding:** Primarily a bird of the wet lowlands of the southeastern United States, from eastern Texas, the Gulf Coast and most of Florida northward, becoming less common and patchily distributed, to southeastern Minnesota and across southern Great Lakes region to southern Ontario, western New York and northern New Jersey. Breeding range has expanded northward, especially in the Mississippi Valley and vicinity, and nesting recently was recorded in Rhode Island.

**Winter:** Most commonly found in Panama, western Colombia and northern Venezuela, but extends from the Yucatan peninsula south, barely reaching Suriname and northern Ecuador. Occurs on the Caribbean slope of Central America to Nicaragua, occurs on both slopes of Costa Rica and Panama reaching from Colombia east to northern Venezuela. Apparently overwinters in West Indies, uncommon in Puerto Rico, rare in Virgin Islands; has been recorded on the Galapagos Islands nearly 600 miles (1000 kilometers) west of mainland South America.

### Breeding habitat

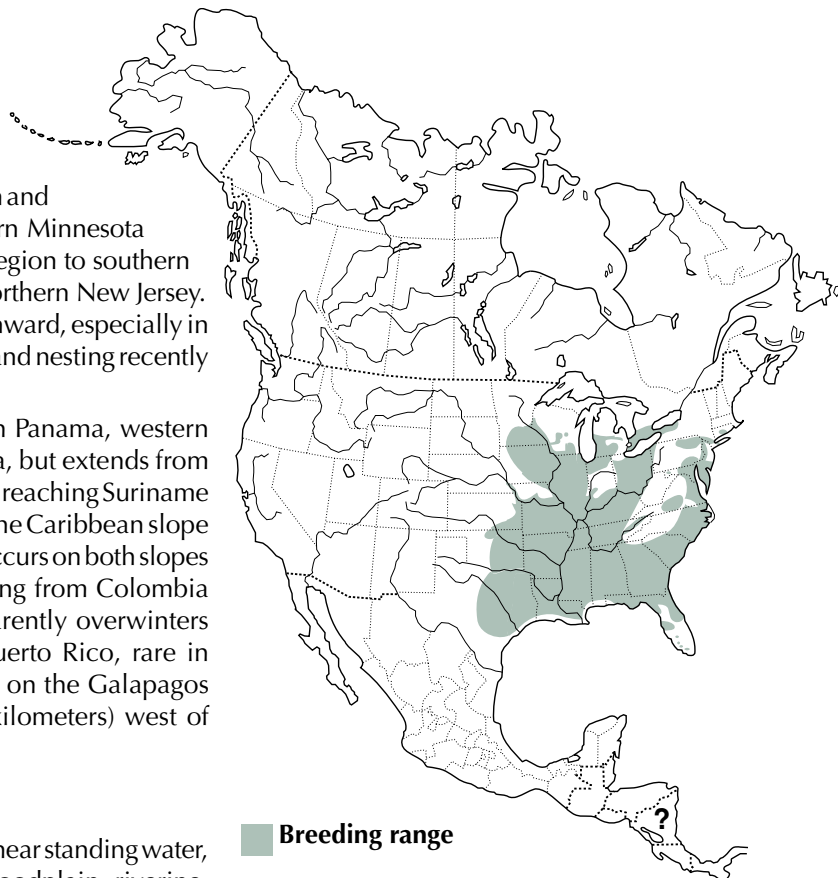
Primary habitats are almost always near standing water, especially in mature deciduous floodplain, riverine, swamp, and other wet lowland forests. Bottomland hardwoods, cypress swamps, and extensive willow thickets near lakes or ponds are suitable; swamps that are somewhat open with scattered dead stumps are preferred. Dense underbrush along streambanks is required.

### Conservation status

This warbler of high conservation concern, because of its relatively small and patchy breeding range, its association with extensive bottomland forests, and its even more restricted winter range in tropical lowland forests. Populations have shown a steady long-term decline, with a loss of nearly 30% since 1966. Declines have been steepest in the Mississippi Valley and the coastal plains, especially since 1980. Understanding this species' sensitivity to forest fragmentation, silvicultural practices, and other land uses will be important for conserving future populations.

### Description

**Male:** A relatively large, short-tailed, and long-billed warbler with a brilliant golden-yellow head and



breast. Eyes are large, dark, and prominent; bill is black. Underparts are yellow, fading to white under-tail coverts. Wings are blue-gray, without wing bars, back is greenish with yellow tint, the blue-gray tail has large white patches.

**Female:** Similar to adult male, but duller yellow with crown and nape showing a distinct greenish wash.

**Juvenile:** Dull brownish-olive above and yellowish-olive below, paler on belly and under-tail coverts.

### Vocalizations

**Songs:** A series of simple, loud, ringing *zweet* notes composed of a single syllable repeated 4–14 times, increasing in amplitude toward the end. Occasionally, males will sing double songs.

A second, less frequent song is sung primarily during interactions with females and often in aerial Flight Displays. This extended song is longer and slightly more complex than primary song, beginning rapidly and slowing down at end: *chwee-chwee-chwee-chwee, teer, teer, teer*, or *che-wee-chewee-chee-chee*.

**Calls:** Primary call note is a loud sharp *tschip*, similar to that of Louisiana Waterthrush. A second call note, usually used in interactions between sexes, is a quieter, thin *tsip*, often repeated several times in rapid succession.

### ***Foraging strategy***

Usually forages low around trunks and limbs of trees, rotten logs, and along the edges of pools. As a relatively slow-moving, thorough forager, most foraging maneuvers are gleaned from leaves, twigs, and branches. In addition, hovering and fly-catching may be employed, also probing and peering into curled leaves or on bark substrates for spiders and caterpillars.

### ***Diet***

Primarily insectivorous, focusing on butterflies, moths, flies, beetles and spiders, occasionally taking mollusks and isopods.

### ***Behavior and displays***

- Hops along branches and twigs in trees and shrubs, on downed logs, and on ground while foraging.
- Usually flies low within and among trees or below canopy in open understory.
- In both sexes, agonistic display includes “head-up posture,” along with a “wing-droop” *display*.
- Male displays at potential nest sites, repeatedly entering and exiting cavity.

### ***Courtship***

- Male flies close to female, both birds vocalize with soft, rapid *tsip* calls, distinct from typical call notes. The female then exhibits “precopulatory” display by drooping and quivering her wings, holding her head low, in line with back, elevating her rump and tail slightly above back, and vocalizing by giving a thin, high-pitched twittering call while quivering wings. Male exhibits similar wing flutter while spreading tail feathers.

### ***Nesting***

**Nest Site:** The only eastern warbler that nests in cavities; the male selects the territory and nest site by placing material in a cavity before the females arrive on breeding grounds. Natural cavities in dead snags or branches of live trees, such as abandoned Downy Woodpecker nests, are used, as are artificial cavities, such as standard nest boxes, milk cartons, and Metamucil jars. Has been found using an abandoned open nest of another species. Nest sites almost always occur over or near water.

**Height:** Nest cavity entrance hole is usually 6 feet (2 meters) or less above ground or water surface, but can range to over 25 feet (8 meters) high.

**Nest:** A cup-shaped hollow of mosses, rootlets, twigs, and leaves, smoothly lined with fine grasses, leaf stems, and feathers. Moss appears to be important in nest construction.

**Eggs:** 3–7 oval to short-oval eggs, with a smooth shell, creamy color, spotted and blotched boldly and liberally with brown. Clutches in first half of season usually 5 eggs, later clutches usually 4 eggs.

**Incubation period:** Nesting occurs from late April to late June, with a peak from mid-May to mid-June. Incubation, by female, typically lasts 12–14 days.

**Nestling period:** Young are Altricial and naked with sparse downy feathers. Female broods young up to day 3–4, both parents tend to young.

**Fledgling period:** Young usually depart nest on day 10 after hatching, but can fledge 1 day earlier if disturbed. Parents divide brood immediately after young fledge; each adult cares for different young. Fledglings remain in close proximity to nest. If the female re-nests, male cares for all fledglings in first brood.

**Broods:** Second broods occur regularly in the southern United States, infrequently in northern areas.

**Cowbird Parasitism:** A frequent host of the Brown-headed Cowbird.

### ***Notes***

- Reproductive success in natural cavities appears to be significantly lower than in nest-boxes. This difference in nest success appears to be mostly due to regional differences in competition with House Wrens.

# SWAINSON'S WARBLER

## (*Limnothlypis swainsonii*)

### Distribution

**Breeding:** Locally through the southeastern U.S., from eastern Texas and Oklahoma through the southern portions of Missouri, Illinois, Indiana, Ohio, and West Virginia to southern Delaware and Virginia, south to the Gulf Coast in northern Florida.

**Winter:** Cuba, Jamaica, northern Bahamas, Cayman Islands, Isla Cozumel, south to Honduras and east to Puerto Rico and Virgin Islands; sparingly on Yucatan Peninsula, including Belize and northern Guatemala.

### Breeding habitat

Lowland populations, those found on the coastal plain, use mature, rich, damp, deciduous floodplain and swamp forests, where they normally occur in the shadiest parts of the forest. Forest structure consists of dense upper and lower canopy and shrubs, with little herbaceous cover.

Highland populations, found in the mountains, utilize moist lower slopes of mountain ravines at elevations up to 2,800 feet (850 meters). The dominant shrub layer consists of rhododendron and laurel species. In the southern Appalachians, individuals primarily found in sawtimber and in pole stands of second-growth cove forests.

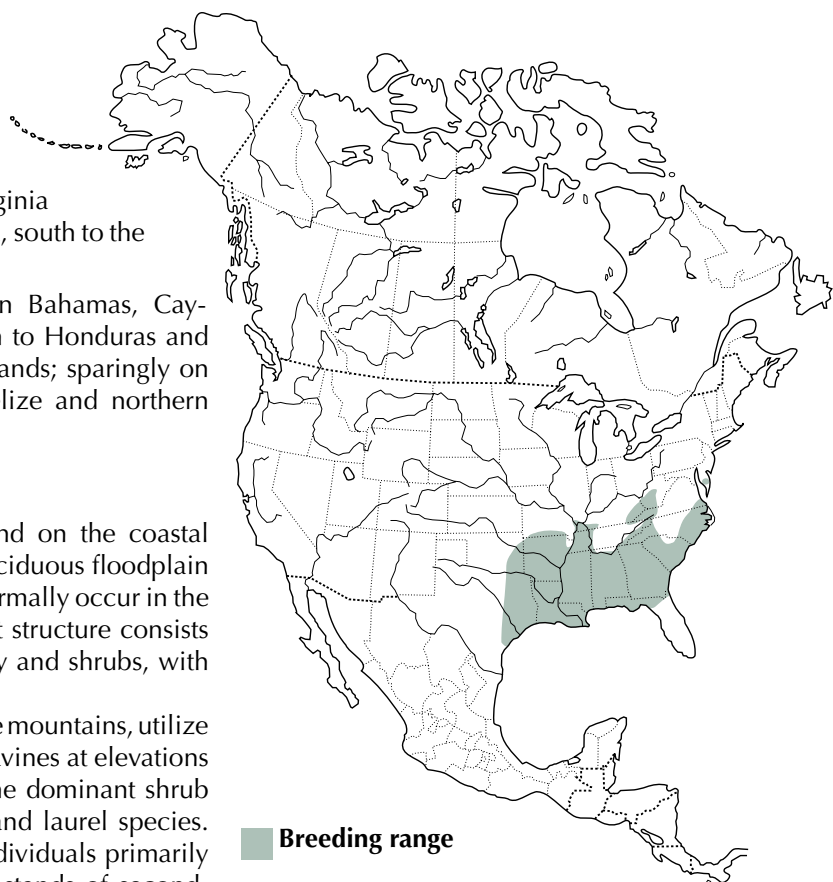
### Conservation status

This warbler is of high conservation importance, because of its small breeding range, specialized habitat requirements, low overall densities, and even more restricted winter distribution. It is poorly monitored in many areas, but populations appear to be stable at present. Understanding this species' specific habitat requirements, area sensitivity, response to forest fragmentation and other land-use practices will be very important in conserving future populations.

### Description

**Male:** A large and heavy bodied warbler with a long, spike-like bill. Generally brown above, richer brown on hindneck and crown. A broad, pale-white eyebrow and dark eye-line are similar to Worm-eating Warbler and both waterthrushes. Underparts are white with varying yellowish tint, also a varying gray-brown wash on flanks and chest. The tail is noticeable short, and the legs and feet are pinkish.

**Female:** Same as adult male.



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**Juvenile:** Same as adult male.

Vocalizations

**Songs:** The "advertising" or "primary song" consists of 2–4 down-slurred notes (reminiscent of the beginning of the Louisiana Waterthrush's opening) followed by several rapid and descending notes: *wee wee wee whip-poor-will*. A "whisper song" is simply a softer version of the primary song, also heard throughout the breeding season. A territorial "flight song" is as loud as the primary song, but continuous and lasting as long as the flight.

**Calls:** A distinctive, loud, and sweet *chip* or a flatter *tup*, a very high, thin, slightly buzzy, and often doubled sweets heard in flight.

### Foraging strategy

Forages primarily on the ground by probing bill under leaves, pushing leaves up, and examining ground or leaves underneath for prey; may also open curled leaves by inserting and opening bill. Occasionally forages on top of fallen logs and in low undergrowth foliage; sometimes hawks insects from low perches

in trees or gleans insects from lower parts of tree trunks.

## **Diet**

Insectivorous, primarily spiders, caterpillars, beetles, ants, spiders, ichneumonids, platygasterids, crickets, grasshoppers, katydids, stink bugs, flies, and millipedes. Not known to eat fruit or nectar.

## **Behavior and displays**

- Unlike most warblers, flies directly from perch to perch instead of hopping through branches.
- Vocal threats include chipping excitedly and singing songs during and after territorial encounters. Visual threats displayed by laterally spreading wing and tail feathers and vibrating tail, then walking sideways back and forth along a branch, frequently turning around.
- Males chase each other during breeding season, and may flutter on the ground together, sometimes flying 3–7 feet (1–2 meters) up from ground while grasping at each other's bill.
- Paired males appear to be more aggressive than unpaired males at border disputes.
- Copulation often involves the male flying to the female as she forages on the ground, he then pounces on her, pecks at her rump, and struggles with her on ground for a few meters with very rapid movements.

## **Courtship**

- During precopulatory display male perches 3 feet (1 meter) from ground, extends quivering wings and raises head tail and rump feathers. When the female approaches, the male vocalizes with quiet twee-twee-twee.
- Courtship feeding not observed.

## **Nesting**

**Nest Site:** Female selects site, usually at the edge of a dense growth of cane, vines, or rhododendron; often situated near (sometimes over) water, but also on high, dry sites. The nest is placed in the predominant understory vegetation where it is suspended by several thin vines or supported by small trees or bushes, especially at intersections of branches or separate plants; rarely placed in the thickest part of the vegetation. Often located near edge of territory, or at least male usually spends most of time away from 1 side of nest, sometimes outside of male's territory.

**Height:** Usually low, average nest height just over 3 feet (1 meter) above ground, but can range from 1.5–10 feet (0.5–3 meters).

**Nest:** Female builds the cup nest using materials gathered near the nest site. The outer layer is loosely constructed of dried leaves, sticks, vines, and tendrils, giving an appearance of an unorganized clump of leaves. The shell of the nest cup is compactly built using skeletonized leaves and may be covered by a layer of twigs or needles. Nest building takes 2–3 days and takes place before noon.

**Eggs:** 3 eggs (rarely 4 or even 5) are laid in late April or May through July. Usually white and unmarked, though occasionally bluish or pinkish and rarely faintly spotted with reddish brown.

**Incubation period:** 13–15 days, only by female.

**Nestling period:** Young are altricial and nidicolous, primarily naked with closed eyes. Both parents feed young; both parents remove fecal sacs. Young remain in the nest 10–12 days.

**Fledgling period:** Fledglings are unable to feed themselves, birds 2 days out of the nest are not able to fly far, mostly hopping along the ground. Parents feed young for 2–3 weeks after young fledge, Meanley (1968) reported that only female fed young that fledged from a nest in Virginia, although male was often nearby. Fledglings emit chip notes to inform feeding parents of their location, increasing intensity as parents get closer.

**Broods:** Occasionally double brooded, but whether two clutches per season is ordinary is controversial.

**Cowbird Parasitism:** Known host of the Brown-headed Cowbird, may be common in some areas.

## **Notes**

- One instance of apparent polygyny with aggregated nest placement reported. Knowledge of how common such behavior is would be useful in estimating population size from singing male counts.
- Reproductive success at nests observed in coastal plain habitat was low. Cowbird parasitization was the cause of at least three failures, while Common Grackles, Blue Jays, and snakes depredated nests. One researcher (cite?) concluded that the Swainson's Warbler would probably have a difficult time maintaining its present population level in the Coastal Plain.



# KENTUCKY WARBLER

## (*Oporornis formosus*)

### Distribution

**Breeding:** Primarily a bird of the southeastern United States; breeds from the eastern edge of the Great Plains to the Atlantic Coast, ranging from southeastern Nebraska, southern Iowa, and southern Wisconsin to southeastern New York and southwestern Connecticut, and occurring south to Texas and the Gulf Coast to northwestern Florida.

**Winter:** From the tropical zones of southern Veracruz and Oaxaca, through Chiapas, the base of the Yucatan Peninsula, to northern Colombia and northwestern Venezuela. Primarily found on the Caribbean slope of northern Central America, throughout Costa Rica and Panama. An uncommon transient through the West Indies, some may overwinter on eastern and southern West Indies islands.

### Breeding habitat

Found in humid deciduous forest, dense second growth, and swamps, favoring forests with a slightly open canopy, dense understory, and well-developed ground cover. Most commonly found in medium-aged forests, although they occur in stands of various ages. Seldom found in conifers.

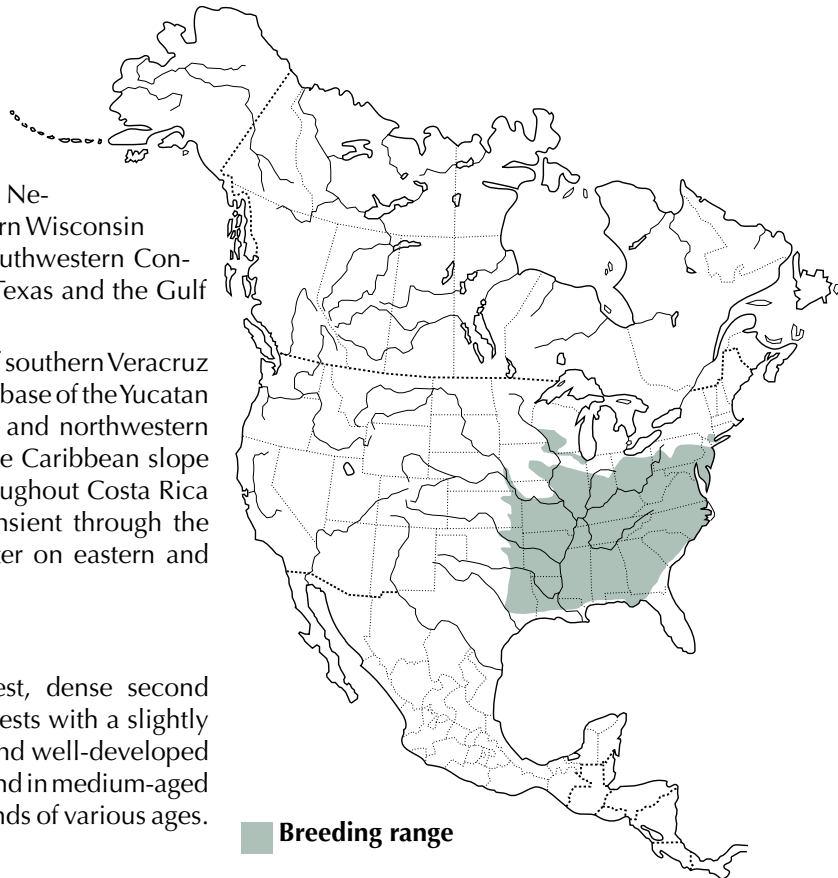
### Conservation status

This warbler is of high conservation importance, because of its relatively small breeding distribution, its low density, and its association with mature forests both for breeding and on its tropical wintering grounds. Populations have been steadily declining in most areas, especially in the southern Appalachian region, with an overall loss of nearly 30% since 1966. Precise knowledge of habitat requirements, area sensitivity, and response to silviculture and other land-uses will be key to conserving future populations.

### Description

**Male:** A relatively chunky, short-tailed, and long-legged warbler; upperparts are bright olive, underparts entirely yellow. Distinctive face pattern highlighted by black crown, yellow eyebrow that curls behind the eye, large black patch on face. Bold yellow spectacles separate black crown from black on face and sides of neck. Legs are pink.

**Female:** Similar to adult male, but black areas are duller, sometimes reduced.



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**Juvenile:** Olive-brown above, wings are olive with two brown wing bars. Head and neck are unmarked olive-brown, underparts are yellow-brown, increasingly yellow on flanks and belly.

### Vocalizations

**Songs:** A series of rolling musical notes, *churry chirry chirry*, with each note repeated about six times; can resemble the song of the Carolina Wren or Ovenbird, but lower in pitch and more slurred.

**Calls:** Primary call is a distinctive low, sharp *chuck*.

### Foraging strategy

Forages on the ground by rummaging through leaf litter, probing and tossing with its bill, and also scratching with its feet. Also feeds in shrubs, vines, and lower parts of trees. In breeding season, may feed by gleaning and hawking insects from leaves and twigs of shrubs and trees. Male pauses between singing bouts and feeds from his song perch, and female gleans reachable insects while incubating and brooding.

### Diet



Insects, caterpillars, and small spiders during the breeding season, rarely taking seeds; in Mexico, may feed on *Cecropia* fruits. Also known to eat grasshoppers and locusts.

## ***Behavior and displays***

- On the ground, walks and hops, when foraging on logs or in low branches and vines, hops or makes short flights. Between song perches, males typically fly distances of 6–165 feet (2–50 meters) at heights of 30–80 feet (9–25 meters).
- When disturbed, brooding females sometimes give distraction displays by running on ground.
- Early in the breeding season, mated and unmated males spend almost entire morning singing, and most of rest of day singing interspersed with feeding.
- Although physical contact is rare, males often chase each other early in breeding season. Chases may involve 2, 3, and rarely 4 males, sometimes 1–2 females.

## ***Courtship***

- During pair formation, males and females chase or follow each other by hopping or flying short distances low in vegetation or on ground, often accompanied by loud and rapid chips uttered by both, sometimes a short song vocalized by the female.
- Pairs copulate 0–2 days after pair formation is initiated, and nest building begins later the same day or the next day.
- Males guard pre-incubating and incubating mates, often following them or remaining within visual contact during this time.

## ***Nesting***

**Nest Site:** Female chooses site within minutes or up

to 1 day after pair formation and copulation. Most nests are usually hidden by overhanging vegetation or fallen branches, and built so that the base rests on the ground, sometimes partly anchored by a small shrub. When wedged in dead twigs near the ground, the base is within 1 inch (2–3 cm) of the ground.

**Height:** Ranges from on the ground to 10 feet (3 meters) above the ground.

**Nest:** A cup of grasses, plant fibers, and rootlets 2–4 inches (10–15 cm) deep is lined with rootlets, weed stalks, and grasses and built on a bulky foundation of dead leaves.

**Eggs:** 3–6 (typically 4) white or creamy white eggs are blotched, dotted, or spotted with grays, browns, usually concentrated at large end.

**Incubation period:** Eggs are laid mainly in May or June, incubation (by female alone) lasting 12–13 days.

**Nestling period:** Only female broods; both parents tend to young. Parents bring food to nest in their bills, and insert it into mouth of the nestlings when they gape. Young leave nest at 8–10 days, before they can fly.

**Fledgling period:** If disturbed, nestlings leave the nest as early as 7 days. Young typically perch on low twigs within meters of nest during their first hours and are fed there by parents. Fledglings fly strongly by day 4, and follow parents to beg for up to 17 days.

**Broods:** Typically one brood, but sometimes two.

**Cowbird Parasitism:** Commonly parasitized by the Brown-headed Cowbird.

# HOODED WARBLER

## (*Wilsonia citrina*)

### Distribution

**Breeding:** Primarily a species of the southeastern United States. The breeding range extends west to eastern Oklahoma and Texas, southern Missouri, Iowa and southern Wisconsin, and north to southern Michigan, southern Ontario, New York and Connecticut.

**Winter:** Primarily from eastern Mexico through Central America, mostly on the Atlantic slope (Belize, Guatemala, and Honduras); usually not as far south as Panama, but makes rare appearances in northern South America.

### Breeding habitat

Reaches highest densities in large tracts of mature, uninterrupted, deciduous forest with a dense shrub layer and scant ground cover. Breeds in both upland (usually oak-hickory) and bottomland forest types; in Canada, restricted to Carolinian forests of southern Ontario. Somewhat tolerant of disturbance, such as selective logging, that promotes growth of shrubs.

### Conservation status

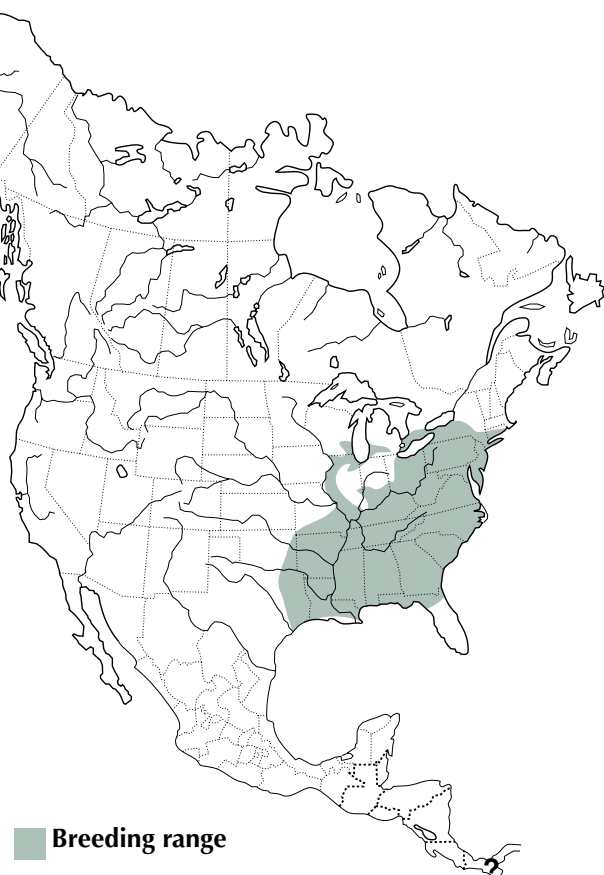
This warbler is of moderate conservation importance, because of its relatively small total breeding range and associations with mature deciduous forests. Breeding populations appear to be stable or even increasing in some areas at present; populations may be more vulnerable on their wintering grounds, where they generally inhabit rapidly disappearing lowland tropical forests. Relationships with forest fragmentation and silvicultural practices are poorly known and will be important for sustaining future populations.

### Description

**Male:** The black hood, which is created by the solid black crown and throat connected along the sides of the neck, sets off the brilliant yellow face and forehead. Upperparts are olive, underparts yellow. White patches in tail seen during behavioral displays where tail is spread.

**Female:** While some adult females may resemble the male's hooded pattern, most show a yellow face and throat bordered below by black. While the front of the crown may be black, the rear crown is mostly olive, and blends into the back.

**Juvenile:** Extensively brownish-olive above, dull buff



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below with light yellow mottling on the breast.

### Vocalizations

**Songs:** Males have several song types, but the most common is *ta-wit ta-wit ta-wit tee-yo*. Other song types are sung irregularly, but share the sweet, clear quality of notes and often the *wit-tee-yo* ending.

**Calls:** Both males and females give the loud and metallic-sounding *peenk* notes, primarily by the female during the breeding season, but during aggressive interactions rates become very frequent. Both give this note when defending winter territories.

### Foraging strategy

Gleans from foliage while moving about a shrub or sapling, but will also hover-glean and sally for flying prey items.

### Diet

Exclusively insects, including small spiders, caterpillars, moths, grasshoppers, beetles, and flies.

### Behavior and displays

- *Tail fanning* occurs frequently in both sexes, revealing the large white tail spots of the dark outer tail feathers.
- During the breeding season, males chase intruding males from their territory in chases that may last hours.
- In response to territorial intrusions, males give visual threat displays:

Wing droop: when landing near an intruder, the wings are held slightly out, head is pulled in and feathers fluffed so that bird has hunched appearance.

Head switch: a variation of the wing droop in which the bird's body is turned away from the intruder and head is turned side-to-side.

Upward: in high intensity situations the bird faces intruder, stands close to it, and moves up and down from this position to the wing droop.

Finally, "supplanting attacks," "direct attacks," and "bill snapping" are also included in territorial disputes.

- Precopulatory displays, copulation, and post-copulatory displays are not known.

## Courtship

- No information.

## Nesting

**Nest Site:** Nest sites are primarily along streams and ravine edges in dense deciduous undergrowth. Nests placed in shrubs, often within or along the edge of secondary forest. Frequently used substrates include blackberry, beech, black cherry, and prickly gooseberry, but also mapleleaf viburnum, white ash, black kohash, blue kohash, sugar maple, wild rose, yellow birch, hawthorn, and hemlock. In rare cases, the nest is built in the dead branches of a fallen limb, or pile of debris.

**Height:** Ranges from 1–5 feet (0.3–1.5 meters) above the ground.

**Nest:** An open cup woven of soft inner bark, fine grasses, animal hair, and plant down. Outer portion of nest consists of dead leaves and leaf skeletons, giving nest a camouflaged appearance. The nest is supported with at least 2 vertical or oblique stems of the sapling or shrub; nest materials are held together with spider webs. Built solely by female, although male is sometimes nearby.

**Eggs:** 3–4 creamy white eggs, scattered with markings concentrated at large end.

**Incubation period:** 12 days, exclusively by female. Male does not often approach nest and incubation feeding has rarely been observed.

**Nestling period:** Young are altricial at hatching, naked except for sparse down, eyes closed, with little coordinated movement and no ability to find food. Both males and females feed young from hatch day. The young remain largely inactive until parent arrives with food, then stretch neck upward and gape widely. Brooding of nestlings is performed entirely by the female.

**Fledgling period:** Parents often split the brood, females dispersing with their portion while males generally stay on home territory. The young are independent 4–5 weeks after leaving the nest.

**Broods:** Usually single brooded.

**Cowbird Parasitism:** Frequent Brown-headed Cowbird host throughout range.

## Notes

- Predation rates are high throughout range, but if the nest is depredated the female will often renest elsewhere.
- Returning males usually occupy same territory in subsequent years.

# RED-BREASTED SAPSUCKER

## (*Sphyrapicus varius*)

### Distribution

**Year-round Range:** Range extends from southeast Alaska to northern Baja California, Mexico. Some Red-breasted Sapsuckers are migratory while others reside in a single area. Many in Canada and California spend the summer at higher elevations and move to lower elevations for the winter. Some of the sapsuckers seen during winter in coastal California breed east of the Sierras, while many of the Red-breasted Sapsuckers in Washington and Oregon are year-round residents.

### Breeding habitat

Deciduous woodlands and their edges, especially groves of aspen and alder; includes humid coastal lowlands. Also found in mixed evergreen and deciduous forests, primarily aspen-pine associations.

### Conservation status

The Red-breasted Sapsucker is of moderate conservation importance, primarily because of its limited range, low overall density, and association with mature forests of the Pacific Coast. The population in California appears to be declining, whereas those further north appear to be stable or increasing. Being a primary cavity nester, this species provides nest-sites for many other forest species, and understanding its relationship with forest fragmentation and silvicultural practices will be important for maintaining future populations.

### Description

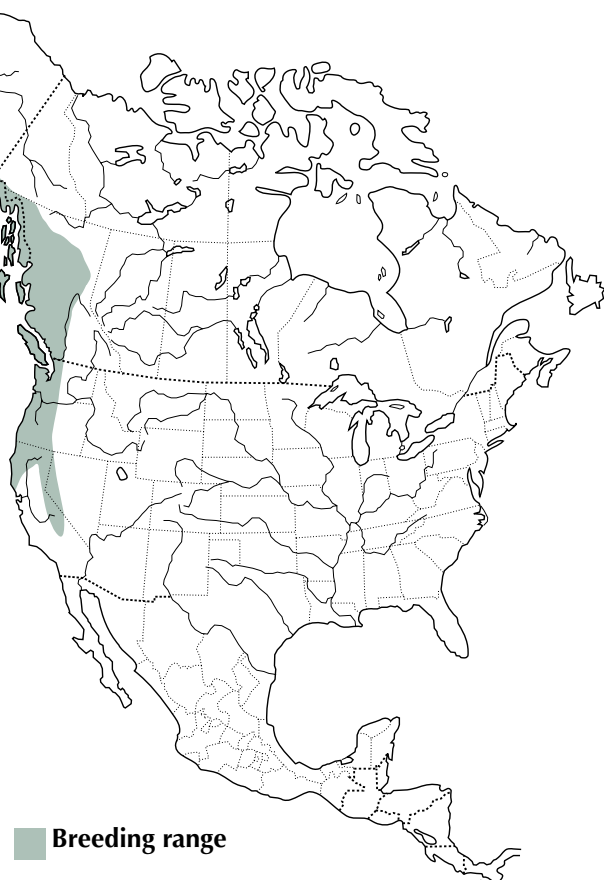
**Adults:** Distinctive markings of all birds include a red head, nape, throat and breast, a large white wing patch, and white rump. In northern birds, the black back is lightly speckled with yellow and the belly is yellow. Southern birds' black back is heavily marked with white and the belly is pale. Also, southern birds show a duller head pattern; the moustachial stripe is longer than northern birds.

**Juvenile:** The head, nape, and breast are dark brown or blackish with a wash of red. Wings and tail are checkered black and white.

### Vocalizations

**Drum:** A burst of about five rapid taps followed by gradual slowing with occasional double taps.

**Calls:** All calls and drum similar to Yellow-bellied



and Red-naped sapsuckers. Contact call is a nasal squealing or mewing *neeah*; on territory an emphatic *QUEEah*, generally lower and hoarser than Yellow-bellied Sapsucker. Close-contact call a hoarse and uneven series of *wik-a-wik-a* notes. In flight, sometimes gives a nasal *geert*.

### Foraging strategy

Drills wells or strips bark to produce sap, usually towards the top of a tree, either on the trunk or an upper branch. Feeds by licking the sap, also eats insects that are attracted to the sap. Generally works around a tree trunk in horizontal lines or a checkerboard pattern. Will also forage among fruiting bushes taking berries and seeds, also known to sally out and retrieve flying insects.

### Diet

Sap extracted from various tree species, including cottonwood, willow, walnut, birch, oak, sycamore, mountain ash, pear, apple, peach, plum and apricot; occasionally redwoods. Consumes ants, which may dominate the diet during certain times of year, as

well as wood-boring beetles and their larvae, other beetles, weevils, caddiceflies, aphids, various other flies, mites and spiders. Fruits include the berries of pepper trees, elderberries, dogwood, and occasionally poison oak.

### ***Behavior and displays***

- Habits are similar to those of the Red-naped and Yellow-bellied sapsuckers.
- Very fond of hanging from telephone poles, and may allow close approach.
- All sapsuckers are typically very quiet birds except during the mating season and while incubating and feeding young.

### ***Courtship***

Not well known, but probably similar to Yellow-bellied Sapsucker (see “Yellow-bellied Sapsucker: Courtship,” page 3.1.6).

### ***Nesting***

**Nest Site:** The nest cavity is often excavated in aspen, but are placed in whatever trees are abundant in their vicinity. At low elevation, prefers live deciduous tree

(alder, cottonwood, aspen); at higher elevations fir, alder, or willow preferred. Deciduous snags are also used.

**Height:** Usually below the first limb, 10–20 feet (3–6 meters) from the ground.

**Nest:** No nest build, but wood chips from excavation remain in the bottom of the nest cavity.

**Eggs:** 4–5 (occasionally 6–7) pure white eggs with little or no gloss.

**Incubation period:** 14 days, shared by both parents.

**Nestling period:** Male and female tend young, which leave nest 25–29 days after hatching.

**Fledgling period:** Young spend several days crawling around their nest tree before they learn to fly, then remain with adults learning how to extract sap from trees. The parents feed the young fruit and insects during this time.

**Broods:** No information.

**Cowbird Parasitism:** Not known to occur.

### ***Notes***

- Sap wells made by the sapsucker are used by warblers, hummingbirds, and other species.



# WILLIAMSON'S SAPSUCKER

## (*Sphyrapicus thyroideus*)

### Distribution

**Breeding:** Southern British Columbia south through central Washington to central California, also from Idaho and western Montana extending south through Utah, western Wyoming and western Colorado to northwestern New Mexico and northern Arizona.

**Winter:** Central Arizona and New Mexico south through the Sierra Madres to central Mexico.

### Breeding habitat

Throughout range, breeds at middle to high elevations, generally from 4,900–10,500 feet (1,500–3,200 meters), in montane spruce-fir, Douglas fir, lodgepole pine, and ponderosa pine forests, but also in mixed deciduous-coniferous forest with quaking aspen as an important nesting substrate. Nests from 2,800–4,250 feet (850–1,300 meters) in extreme northern portion of range; availability of suitable nests sites (snags) is a critical component of breeding habitat.

### Conservation status

This woodpecker is of moderate conservation importance, primarily because of its limited and patchy breeding range, low overall density, and association with mature forests of the western mountains. Being a primary cavity nester, this species provides nest-sites for many other forest species. Populations of this species are poorly monitored, and we have little information on status or trends. Understanding its relationship with forest fragmentation and silvicultural practices will be important for maintaining future populations.

### Description

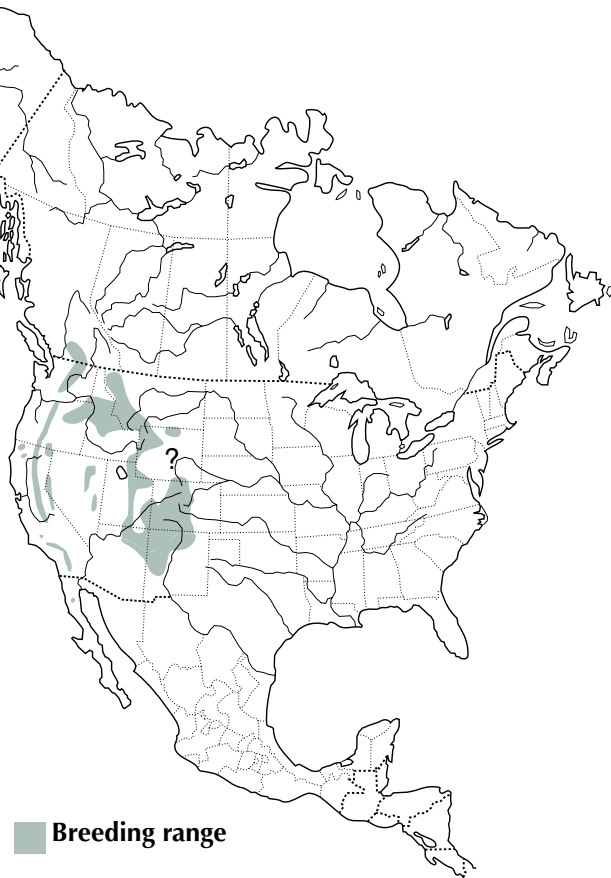
**Male:** All black upperparts with a large, white wing patch and white rump; chin and throat red, breast black, belly yellow, flanks barred black and white. Head black with narrow white stripes.

**Female:** Lacks red chin and white wing patch of male; back, wings, and sides are barred with white and brown, rump white. Dark patch on breast, belly variably yellow.

**Juvenile:** Resemble adults, but coloring is duller.

### Vocalizations

**Drum:** Similar to Red-naped Sapsucker, but slower and more regular, with longer beats. Described as



a steady roll of taps followed by single, loud taps at irregular intervals.

**Calls:** Six different calls:

**Churr call:** Mainly a male vocalization functioning as territorial announcement or pair formation, often given in association with drumming.

**Chatter call:** Usually given softly, used as communication between mates, often precopulatory. Varies from slow *ch-ch-ch* series to rapid bursts.

**Ch-hah:** Given at the beginning of a territorial or courtship interaction, also used as an alarm call. Consists of two hoarse syllables, the second syllable lower in pitch, less emphatic, and longer in duration.

**Rattle call:** Used at the end of a territorial or courtship interaction; also used as alarm call. Described as a rapid, guttural trill.

**Scold or Alarm call:** The most common vocal response to intruders near a nest or sap tree. Consists of a short, sharp, hoarse guttural roll dropping rapidly in pitch.

**Scream call:** A shrill, high pitched call, often given when a bird is caught and held by humans.

## Foraging strategy

Mostly sapsucking and insect-gleaning from tree bark. Concentric rings of shallow wells (holes) are drilled in sap trees, which are checked periodically for sap and trapped insects. Sections of bark may be removed to facilitate greater sap drainage. Occasionally flycatches, flying out from trunks in a small loop to catch insects in midair.

## Diet

Omnivorous, exhibiting high seasonal specialization. During the pre-nestling period, feeds exclusively on conifer sap, but shifts to mainly ants after young hatch. Other insects, e.g. beetles, flies, aphids, are also taken during the breeding season.

## Behavior and displays

- Male defends territory, especially during establishment, often chasing conspecific males.
- Intruding males and resident males often drum or exchange *churr* calls (see “Vocalizations” above) within sight of each other, culminating in retreat of the intruder or aggressiveness by resident male.
- Spends most of its time clinging to and climbing vertical surfaces of tree trunks.
- Approaches nest containing young by landing above nest hole and descending “jerkily” to level of hole.

## Courtship

- Pre-copulatory displays include a “bouncing (fluttering) flight” display, where the male approaches his mate from above while giving a chatter call, and descends slowly (fluttering) to perch beside her as both birds call.
- After a series of “bobbing-wagging” displays, the male initiates copulation.

## Nesting

**Nest Site:** Nests in newly excavated cavities adjacent to open ponderosa forest. Similar to requirements of Red-naped Sapsucker, but Williamson’s tends to select nest sites in areas close to conifer-dominated forest with few aspens, while Red-naped chooses deciduous-dominated (i.e., aspen) areas.

**Height:** Average height about 8 feet (2.5 meters).

**Nest:** Males appear to excavate the majority of the cavity, working several hours a day for 3–4 weeks, although females have been observed excavating at least some of the time. Inside the nest cavity, a small bed of wood chips and shavings serve as bed for eggs.

**Eggs:** 3–7 (usually 4–6) pure white and slightly glossy eggs are laid, one per day.

**Incubation period:** Incubation begins before clutch is complete, and usually lasts 12–14 days.

**Nestling period:** Young are altricial, with eyes closed, naked, and bright flesh-pink in color at hatching, and nestling ages differ by 1–2 days; sexually dimorphic plumage patterns appear immediately. Nestlings are capable of weak vocalizations soon after hatching, and beg almost constantly thereafter, becoming increasingly louder with time. Both parents brood young, each parent feeds nestlings, rotating brooding and foraging activity for the first 2 weeks. Unlike most other ant foragers, this species does not regurgitate food to its young; instead, parents carry food, mostly ants, in throat mouth and bill.

**Fledgling period:** Nestlings depart the nest cavity 31–32 days after hatching, usually requiring 1–2 days, but often up to 3–4 days, for the entire brood to leave nest. Once fledglings emerge, they do not reenter the cavity, but fly to nearby tree to be fed by parents.

**Broods:** Single brooded.

**Cowbird Parasitism:** Not known to occur.

## Notes

- Williamson’s and Red-naped Sapsuckers have similar nest-site preferences, but may sustain ecological separation by selecting nest sites on basis of proximate foraging habitat.

# LEWIS'S WOODPECKER

## (*Melanerpes lewis*)

### Distribution

**Breeding:** From interior southern British Columbia and southwestern Alberta south to Arizona and New Mexico, and from coastal California east to Colorado. Virtually the entire Canadian population occurs in British Columbia.

**Winter:** Interior southern British Columbia (casually) south through the western states to northern Mexico, but mainly in the southwestern United States.

### Breeding habitat

Three principal habitats are open ponderosa pine forest, open riparian woodland dominated by cottonwood, and logged or burned pine forest; however breeding birds are also found in oak woodland, nut and fruit orchards, pinyon pine-juniper woodland, a variety of pine and fir forests, and agricultural areas including farm and ranchland. Important aspects of breeding habitat include an open canopy, a brushy understory offering ground cover and abundant insects, dead or downed woody material, available perches, and abundant insects.

### Conservation status

This Lewis' Woodpecker is of high conservation importance, because of its relatively small and patchy distribution, low overall density, and association with mature montane and riparian forests. This species is poorly monitored in many parts of its range, but exhibits a significant long-term decline overall. Populations may have declined by as much as 50 % since 1966. Associations with various forest types, sensitivity to fragmentation and silvicultural practices are poorly known and will be important to understand for sustaining healthy populations.

### Description

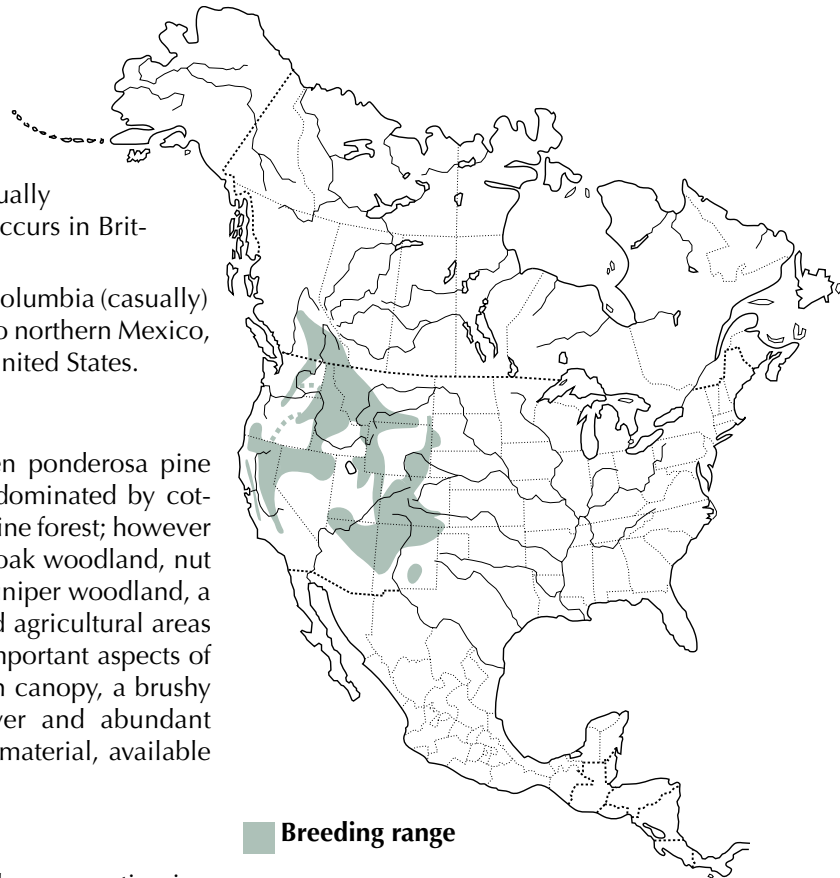
**Male:** Upperparts consist of greenish-black head, back, wings and tail, and a light gray collar. Face, chin, and cheeks are red, breast light gray, belly pinkish.

**Female:** Same as adult male.

**Juvenile:** Head, face, breast brown, body greenish-black; lacks red face and the light gray collar.

### Vocalizations

**Drum:** Short, weak, and at medium speed followed by several individual taps.



**Calls:** A series of short, harsh *chr* notes. The “contact call” is a weak, sneezy *teef* or *kitsif*; also a high, squeaky, descending *rik rik rik*. Dry, rattling chase series reminiscent of European Starling.

### Foraging strategy

Starts at base of tree or near trunk and works up or out to smaller branches. Gleans, similar to other woodpeckers, but seldom if ever excavates for wood-boring insects. Catches insects by gleaning and flycatching; does not dig in soil when foraging on ground.

### Diet

Varies with seasonal abundance of food items; primarily free-living (not wood-boring) insects older than larval stage, principally ants, bees, and wasps, beetles, and grasshoppers; acorns or other nuts, and fruit.

### Behavior and displays

- Detailed quantitative studies of motions are lacking, although climbs up poles, trees, and branches

with head up and tail down in the same way as other woodpecker species; also hops laterally along thin branches.

- Flight differs markedly from other North American woodpeckers: in addition to direct flights between foraging or perching locations, foraging flights include short duration hawking with little gliding; longer duration hawking with prolonged gliding; and nonspecific foraging of much longer duration, including prolonged periods of continuous flapping and gliding.
- Aggressively defends winter stores of acorns and other nuts. Territoriality can be intra- and inter-specific, and can occur in summer in defense of area in vicinity of nest cavity as well as in late fall and winter in defense of acorn or nut stores.
- “Bill-up” display is given to intruders; “wing-out” display is given to intruders and to mate; “circle flight” display is given to intruders and to mate.

## Courtship

- Sounds and displays used for courtship include “chatter call,” “churr call,” “drumming,” “wing-out” display, and “circle flight” display; some of these behaviors are also used during territorial encounters.

## Nesting

**Nest Site:** Nest cavities excavated in trunk or large branches of large, dead or decaying trees, including burned trees, often just below a limb or large knot. Tree species used include cottonwood, ponderosa pine, Jeffrey pine, white fir, lodgepole pine, juniper, willow, and paper birch. Nest sites are associated with presence of abundant insects, open-canopy forest or tree clusters, standing dead trees, and dense ground cover in the form of downed material, grasses, and shrubs.

**Height:** 22–65 feet (7–20 meters), varies by region.

**Nest:** Cavity excavated by both sexes, in trunk or large branch of tree if new nest, but often reuses old nest holes or natural cavities in tree; bed of chips approximately 3 inches (8 cm) deep at bottom of nest.

**Eggs:** 5–9, usually 6–7, opaque white eggs.

**Incubation period:** 12–16 days, adults alternate incubating during the day. Male incubates at night.

**Nestling period:** Both adults contribute equally in diurnal care (feeding, brooding, and attentiveness), but male broods at night and removes more fecal sacs from nest than female does. Young leave nest between 28–34 days.

**Fledgling period:** Juveniles remain near nest site for at least 10 days, begging for and receiving food from adults. Young follow adults and give begging calls when adults approach with food. After leaving nest hole, young immediately climb around nest tree, poking bill into cracks and crevices. Potentially heavy predation by American Kestrel exists for recently fledged juveniles.

**Broods:** Single brooded.

**Cowbird Parasitism:** Not known to occur.

*WHITE-HEADED WOODPECKER*  
(*Picoides albolaratus*)

## Distribution

**Year-round Range:** South-central British Columbia, north-central Washington and northern Idaho south through Oregon (east of Cascades) to southern California. Usually at elevations of 3,600–8,400 feet (1,100–2,550 meters) during nesting season, may descend to lower elevations during winter. Fairly common over most of range, rare and local in north.

### *Breeding habitat*

Montane coniferous forest, primarily pine and fir, with a relatively open canopy and the presence of numerous snags or stumps. Highest abundances occur in old-growth stands, particularly ones with a mix of two or more pine species. Uncommon or absent in monospecific ponderosa pine forests and stands dominated by small-coned or closed-cone conifers (e.g., lodgepole pine or knobcone pine).

### *Conservation status*

Although populations appear to be stable at present, this species is of moderate conservation importance because of its relatively small and patchy year-round range and its dependence on mature, montane coniferous forests in the West. Knowledge of this woodpecker's tolerance of forest fragmentation and silvicultural practices will be important in conserving future populations.

### Description

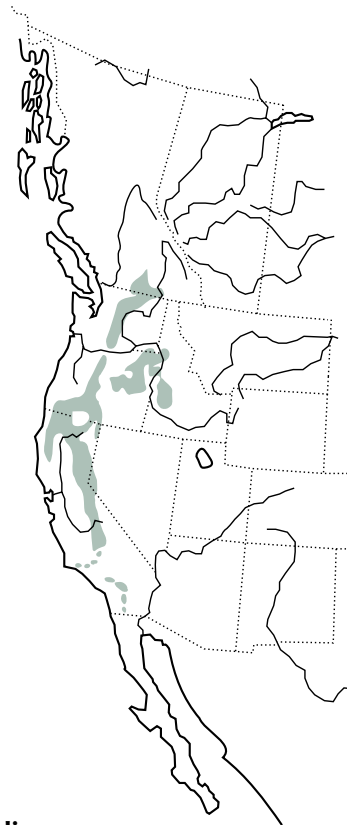
**Male:** A medium-sized woodpecker (9 inches, 23 centimeters); crown, forehead, cheeks, and throat white, red patch on the hindcrown, body entirely black except for white wing patches.

**Female:** Same as male, except lacking the red hind-crown.

**Juvenile:** Same as adult male, but shows a variable red patch on crown (July–Aug.).

## Vocalizations

**Drum:** Fairly long and of medium speed.

[illegible]

### Breeding range

fledging give typical *pee-dink* calls. Several calls used in courtship displays, see "Courtship" below.

### Foraging strategy

Hammering or boring into deep sub-bark layers is rare, resulting in relatively quiet foraging. While direct pecking does occur, a “chisel” maneuver is also employed, where birds flakes and chips bark of conifers with angled strokes. Peers into cracks in bark and probes crevices with tongue. Will also chip open cones to expose seeds.

### *Diet*

Main foods are invertebrates, primarily adult and larval insects, including ants, beetles, and scale insects and conifer seeds. Generally, foraging on cones peaks late summer–winter, but the timing varies with species of pine. Foraging substrate and food items vary geographically depending on diversity and dominant species of conifers, and on severity of winters.



## Behavior and displays

- Movement along vertical trunks typical of *Picoides* woodpeckers, with short hitches using stiffened rectrices as brace.
- Downward (tail-first) hitching along trunk is common during foraging bouts and intraspecific interactions.
- Exhibits typical undulating woodpecker flight, alternating quick flapping bursts with short glides.
- Leaves roost shortly after sunrise, but late riser relative to most species within its habitat.

## Courtship

- Nest demonstration display—one bird, usually the male, gives flutter aerial display toward nest hole, giving “kweek call” in flight and “twitter call” upon landing. Female then flies in and gives rattle call to male, who is at or inside nest cavity. Female flies to horizontal branch near nest tree, the male flies out.

- Soft *chewk chewk chewk* notes and wing-quivering in both sexes precede copulation. After copulation, male flies away, and female flies to and enters nest cavity, giving rattle call.

## Nesting

**Nest Site:** Excavates a cavity in a large diameter dead conifer, stump, or fallen log.

**Height:** 3–25 feet (1–8 meters) above the ground, average 6 feet (2 meters).

**Nest:** Excavated in large snags, usually over 22 inch (58 cm) dbh.

**Eggs:** 4–5 white eggs, often becoming washed and spotted with dirt and pitch as incubation proceeds.

**Incubation period:** 14 days, incubation by both sexes.

**Nestling period:** Nestlings are altricial, tended by both adults. Adults enter nest cavity completely to feed young until young are about 10–12 days old, after which adults only partly enter cavity.

**Fledgling period:** Young leave nest at 26 days, the adults call and drum near nest cavity to coax nestlings out of nest. Both sexes feed fledglings.

**Broods:** Single brooded.

**Cowbird Parasitism:** Not known to occur.

# OLIVE-SIDED FLYCATCHER

## (*Contopus cooperi*)

### Distribution

**Breeding:** Widespread, from western and central Alaska across the boreal and mixed forests of Canada to southern Labrador, Newfoundland, and the Maritime provinces; also south to central Minnesota, northern Michigan, northeastern Ohio, the Adirondack Mountains, and western Massachusetts; breeds locally in high Appalachians south to Tennessee and North Carolina.

**Winter:** South America, mainly in the Andes from Colombia and Venezuela to southeastern Peru; in small numbers in Central America and southern Mexico, also in Amazonian and southeastern Brazil

### Breeding habitat

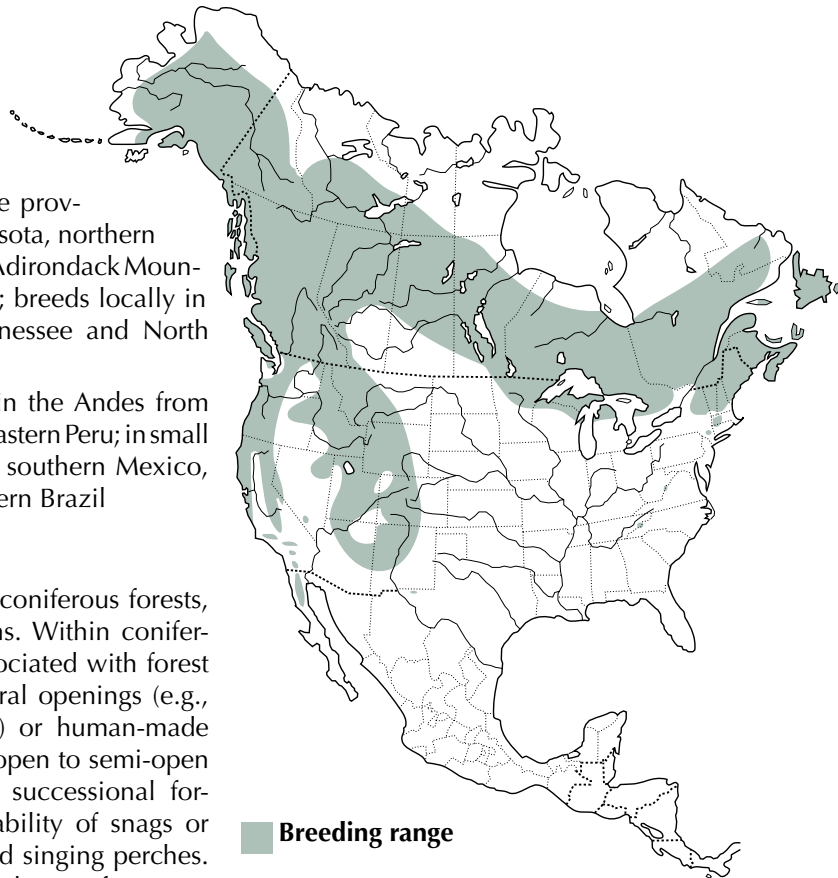
Primarily montane and northern coniferous forests, usually at mid- to high-elevations. Within coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g., meadows, bogs, canyons, rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands. Presence in early successional forest appears dependent on availability of snags or residual live trees for foraging and singing perches. Frequently occurs along wooded shores of streams, lakes, rivers, beaver ponds, bogs and muskegs, where natural edge habitat occurs and standing dead trees often are present.

### Conservation status

In spite of its very large range, this species occurs in overall low density and is of great conservation concern, because of precipitous population declines in nearly every region. An overall loss of 67% has been noted since 1966. Deforestation in its Andean wintering range is a likely culprit, although understanding this species' sensitivity to silvicultural and other land-use practices will be important for conserving future populations.

### Description

**Male:** The Olive-sided Flycatcher is a stout, block-headed, short-tailed bird with a large bill. The back is olive-gray-brown, with similar colored streaked sides. Dull white runs from the throat down the center of the breast to the light belly. Some characterize this underside as an "unbuttoned vest." Pure white tufts



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are sometimes visible on perched birds poking from behind the wings above the rump, and also in front of the wings on the sides (this second set of tufts is not mentioned in most identification guides).

**Female:** Same as adult male.

**Juvenile:** Essentially like the adult in color pattern, but darker above and brighter below; upperparts dark brown, brownish-buffy or brownish-white wing bars are distinct.

### Vocalizations

**Songs:** A sharp, penetrating whistle, *whip WEEDEEER*, often depicted as *quick, three BEERS*, though Pacific birds sing a subtly different *what peeves yooou* with equal emphasis on all syllables.

**Calls:** A low, hard *pep pep pep* with variations from soft, rapid *piw-piw-piw* to harder *pew, pew* to single *pep* or *quip*.

### Foraging strategy

Unlike many other flycatcher species that can attack prey by hovering and striking or pouncing on prey

on the ground, Olive-sided Flycatchers are restricted almost entirely to sallying for aerial prey. Typically sallies out to snatch a flying insect, then returns to the same or another prominent perch. A passive sit-and-wait predator, remaining perched until prey is sighted, then actively pursues prey, including insects that are often difficult to capture.

## ***Diet***

Almost exclusively flying insects. Bees, wasps, and flying ants make up a large portion of the diet; also takes flies, moths, grasshoppers and dragonflies. In Alaska, eats Yellow-jacket Wasps.

## ***Behavior and displays***

- Flight usually direct, fast, and efficient with deep rapid wing-beats and sharp turns when pursuing prey or chasing predators; walking or hopping rarely observed.
- When flushed off nest during incubation, female often drops down toward ground without beating wings.
- Nesting pairs generally are well spaced and require relatively large territory.

## ***Courtship***

- Male pursues female through territory, making several short, looping display flights near perched female.
- Receptive female may fly with male, the birds make shallow, synchronized downward swoops together with 1 bird approximately 3 feet (1 meter) above the other.
- Female solicits copulation by landing on branch near male and rapidly fluttering half-open wings.
- Male also may reinforce pair bond during incubation by occasionally swooping at a perched female to force her back on nest.

## ***Nesting***

**Nest Site:** Female appears to choose nest site, although some males suggest locations by repeatedly flying to certain branches while female is nearby and belly-ing down into foliage as if molding lining of a nest. Generally saddled on top of a horizontal branch, well out toward the tip, often where overhanging branch provides some security and protection from weather. Most nests in coniferous trees, although observed in trembling aspen and willow.

**Height:** Average is 32 feet (10 meters).

**Nest:** Female constructs a loosely formed, somewhat bulky, shallow and relatively small nest. Foundation and frame mostly twigs and rootlets, also uses arbo-real lichens.

**Eggs:** 3, sometimes 4, creamy white, buff or pale salmon eggs with ring or wreath of spots or small blotches near large end.

**Incubation period:** Female incubates for 15–19 days. Male may bring food to female on nest, particularly during early incubation.

**Nestling period:** Little known; lasts 3 weeks, typically between 15–19 days.

**Fledgling period:** Actual time of departure from nest is difficult to ascertain because nestlings spend time on branches near the nest before their first flight, and some birds return to nest or nest branches after fledging. Some departures, particularly when nestling period is protracted or when other nestling have already departed, are solicited by adults with food.

**Broods:** Single brooded.

**Cowbird Parasitism:** Rare host species for Brown-headed Cowbird, possibly due to aggressive defense around nest site.

# CHESTNUT-BACKED CHICKADEE

## (*Poecile rufescens*)

### Distribution

**Year-round range:** Extreme western portions of central California north through Oregon, Washington, Canada, British Columbia, to Alaska. A population also exists in northeastern Oregon, eastern Washington, northern Idaho, northwestern Montana, and south-eastern British Columbia.

### Breeding habitat

Mature conifers, especially low-elevation, coastal, mesic coniferous forests of pines, cedar, tamarack, and hemlock. Typically found in edge habitat, along streams, and in adjacent deciduous woodlands.

### Conservation status

This species is of high conservation importance, primarily because of its limited overall range and its association with mature coniferous forests of the Pacific Northwest. Populations appear to be declining in the southern portion of its range (California, Oregon), whereas those in the north are stable, and the interior Rocky Mountain population is showing an increase. Understanding precise habitat requirements, especially sensitivity to fragmentation and various silvicultural practices will be important for maintaining healthy populations of chickadee.

### Description

**Male:** Upperparts are dull chestnut, contrasting sharply with the dark gray tail and flight feathers; crown is dark brown and extends to the upper mantle. Face is white from the cheeks to the sides of the nape, the bib is dark brown and sharply defined. Bright chestnut flanks contrast sharply with the white belly, except in the coastal California race, which have less chestnut on the flanks

**Female:** Same as adult male.

**Juvenile:** Same as adults.

### Vocalizations

**Songs:** Lacks a whistled song; but an accelerated series of chips may function as song.

**Calls:** Calls are generally higher than other chickadees. Typical calls are high, buzzy notes with lower nasal, husky notes: *tsidi-tsidi-tsidi-cheer-cheer* or a weaker *tsity ti jee jee*. Some buzzy notes are similar to *Dendroica* warbler flight calls.



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### Foraging strategy

Foraging high in trees, gleaning prey from tree bark and foliage. Also gleans prey from tree trunks, as well as rotting logs on the ground.

### Diet

A variety of insects and invertebrates, including wasps, beetles, flies, caterpillars, and spiders; also seeds from the cones of coniferous trees, and some fruit pulp.

### Behavior and displays

- When disturbed at the nest, the incubating bird hisses and flutters its wings.

### Courtship

- No information.

### Nesting

**Nest Site:** Excavate their own nest sites, but will use an existing tree cavity, exceptionally in an artificial nest box. Available tree cavities, particularly in pine,

oak, or Douglas fir, or rotted snags suitable for nest excavation are a requirement.

**Height:** Usually low, up to 10 feet (3 meters) above the ground, can be much higher when in dead trees.

**Nest:** Not known which sex builds the nest; a cup of moss, bark, grass, ferns fur, hair, and feathers, is placed on a base of thick moss, cup lined with milkweed down, fur, and hair.

**Eggs:** 6–7 (ranges from 3–9) non-glossy, white or cream eggs are sometimes unmarked, sometimes red, reddish brown, and brown specks are distributed all over the egg or wreathed at the large end of the egg.

**Incubation period:** Very little information. Incubations appears to be by female only, lasting for 11–12 days.

**Nestling period:** Very little information. Young are tended to by both parents, and leave the nest at 21 days.

**Fledgling period:** Very little known, the family may remain on territory, or may move to more optimal habitat.

**Broods:** No information.

**Cowbird Parasitism:** Not known to occur.

## *Notes*

- The species is currently undergoing a range expansion to the south and to the east.
- Territorial during the breeding period, although sometimes nest in loose colonies.



# CASSIN'S VIREO

## (*Vireo cassinii*)

### Distribution

**Breeding:** Breeds from British Columbia and southwestern Alberta through central Idaho, across to coastal Washington and Oregon, south to southern California.

**Winter:** A small number overwinter in southeastern Arizona, winter range extends south to Costa Rica.

### Breeding habitat

Coniferous and mixed forests, also found in second growth and brush areas on hillsides or along stream bottoms.

### Conservation status

This species is of moderate conservation importance, primarily because of its small overall range, and association with mature forests of the Pacific Northwest. Its populations appear to be steadily increasing in most parts of its range, however. Understanding precise habitat requirements, especially sensitivity to fragmentation and various silvicultural practices will be important for maintaining healthy populations of this vireo.

### Description

**Male:** Shows all of the traits of the "Solitary Vireo complex," and plumage is roughly intermediate between Blue-headed and Plumbeous Vireos. Solid blue-gray hood contrasts with white spectacles and whitish throat, back olive showing white bars on dark wings tinged with greenish-yellow. Bright yellow sides and flanks, sometimes mixed with green.

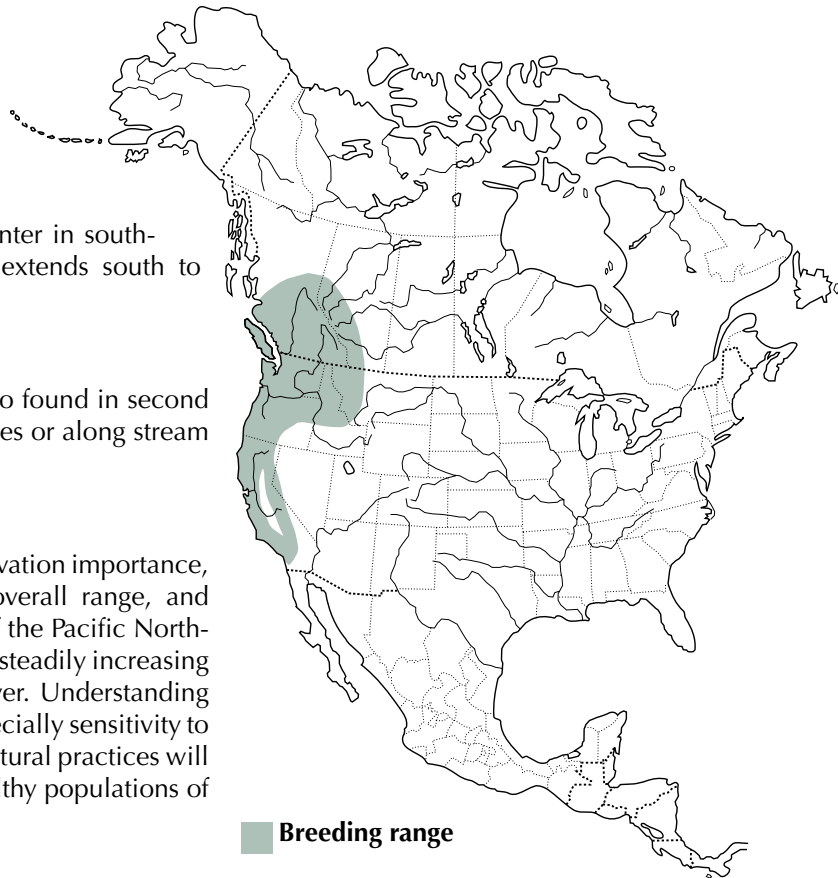
**Female:** Same as adult male.

**Juvenile:** On average, browner and drabber than adults.

### Vocalizations

**Songs:** Consists of rough, burry phrases, very similar to Plumbeous and Blue-headed Vireos. Slightly higher pitched and with more clear phrases than Plumbeous; much overlap, but distinctly lower-pitched and more burry than Blue-headed. Generally depicted as, see you, cheerio, be seein you, so-long, seeya . . . .

**Calls:** A harsh series of falling or steady rapid Notes, *ship ship ship ship ship ship ship ship ship*.



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### Foraging strategy

Searches among leaves and stems of bushes and trees, gleaning insects from foliage. Occasionally sallies or jumps for passing insects.

### Diet

Nearly entirely insects, including squash-bugs, leaf-bugs, stink-bugs, shield-bugs, leaf-hoppers, tree-hoppers, jumping plant-lice, scales, caterpillars, and moths.

### Behavior and displays

- Male performs nest-building display while slightly crouched with body horizontal usually without nest material in bill.
- Fearless around nest; female described as a "close sitter."

### Courtship

- Male fluffs conspicuous yellow flank feathers while bobbing, bowing and singing to female.

- Male occasionally starts building one or more nests before pairing.

## *Nesting*

**Nest Site:** Male selects a site, normally low in bushes or trees. Nest placed in a forked twig of a small forest tree. It breeds commonly and builds its dainty nest low in bushes or trees.

**Height:** Typically 6–15 feet (2–5 meters) high, some nests 32 feet (10 meters) above the ground.

**Nest:** A basket-like deep cup is constructed of grass, forbs, shredded bark, plant fibers, spider web, and cocoons, often decorated with lichen and lined with fine grass and hair. The nest is placed in a forked branch or twig, suspended by the rim.

**Eggs:** 3–5 white eggs are lightly spotted with brown.

**Incubation period:** Little information, 15 days during which both male and female incubate.

**Nestling period:** Young are altricial and downy at hatching, and are tended by both parents.

**Fledgling period:** Nestlings are able to fly at 13 days, usually leave the nest at day 14. Parents divide fledged brood and leave nest area.

**Broods:** Little information, probably double-brooded.

**Cowbird Parasitism:** Common host to Brown-headed Cowbird. If the cowbird egg is laid first, the parents often build a second floor of the nest to cover it.

## *Notes*

- The bird formerly known as the Solitary Vireo was recently split into three separate species by American ornithologists: Cassin's, Plumbeous, and Blue-headed Vireos. Cassin's Vireo occupies the western-most part of the former Solitary Vireo's range.

# SWAINSON'S THRUSH

## (*Catharus ustulatus*)

### Distribution

**Breeding:** From central Alaska and northern Yukon to south-central Manitoba, southern Ontario, Quebec, Labrador, Newfoundland, and Nova Scotia, south through Maine, Vermont, New Hampshire, northwestern Massachusetts, and New York, to northern Pennsylvania. Ranges south in the Appalachians to West Virginia, in the Rocky Mountains to north-central New Mexico, northern Utah, and the White Mountains of Arizona, and in the Sierra Nevadas to southern California. Also in western edge of South Dakota and western Montana. Distinct population on Pacific slope from British Columbia to southern California.

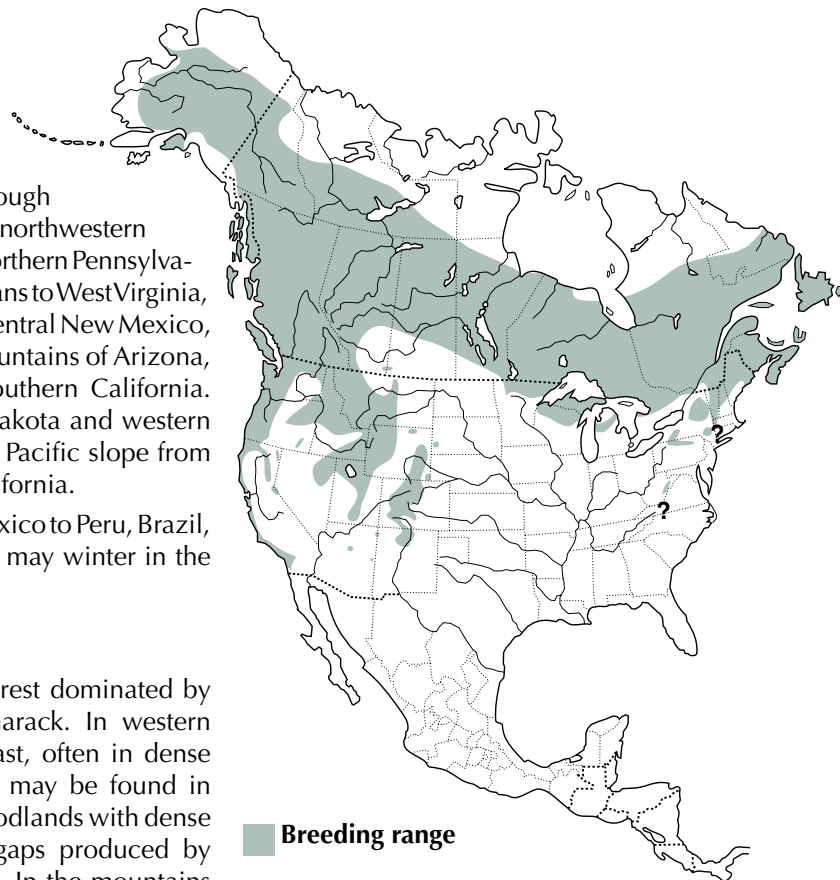
**Winter:** Winters from southern Mexico to Peru, Brazil, and Argentina. A few individuals may winter in the West Indies.

### Breeding habitat

Primarily coniferous or mixed forest dominated by spruce, fir, white cedar, or tamarack. In western mountains and along Pacific coast, often in dense riparian willows or alders. They may be found in both undisturbed or disturbed woodlands with dense understory, often near canopy gaps produced by fallen trees or other disturbances. In the mountains of the Northeast, they are generally found between 1,000–4,500 feet (304–1,370 meters), higher elevations than the Hermit Thrush and lower elevations than the Bicknell's Thrush. Where there is overlap at the lower elevations, the Hermit Thrush appears to dominate over the Swainson's Thrush. In the western mountains they occur up to 9,000 feet (2,740 meters) in the spruce-fir zone and to sea level along the Pacific Coast.

### Conservation status

The Swainson's Thrush has a large range and is very common in many areas, yet it is experiencing steady population declines in regions such as California and the Maritime provinces. It is of conservation importance because of its association with many types of coniferous as well as riparian forests for breeding, and because of its vulnerability to tropical deforestation in South America. Understanding how habitat requirements and sensitivity to fragmentation varies over its large range will be important for conserving future populations.



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### Description

**Male:** Rich, brownish-olive above with buffy lores and a buffy eye-ring. Breast slightly buffy with dark spots, brownish-gray sides and flanks. The Pacific Coast forms are reddish-brown above and less distinctly spotted below. The eye-ring, cheeks, and breast distinguish it from the similarly colored Gray-cheeked Thrush.

**Female:** Same as male.

**Juvenile:** Deep olive-brown above with darker wings and tail; entire upperparts with buffy tips on the feathers. Strongly washed with buff on the throat, breast, and sides; heavily spotted with black on the breast and sides of throat. Pale buffy eye-ring.

### Vocalizations

**Song:** A slurred series of notes spiraling upward in pitch, rather than tumbling downward like the Veery. It is quite complex and variable and has been characterized phonetically as *whip-poor-will-a-will-e-zee-zee-zee* with the last notes often running together into a high trill. Often sings at night.

**Calls:** There are three different calls: a clear, slightly inflected whistled note, *feee-ee*, an abrupt whistle that sounds very similar to the spring peeper, and a loud, sharp *whit*. The last call note is the most common.

### ***Foraging strategy***

Mostly a ground feeder; also forages by gleaning from foliage and occasionally from branches as well as by hawking insects on the wing. Most frequently hunts from a low branch, hopping from perch to perch searching for prey on the ground or within low branches; swoops to pick up prey items in a similar fashion as the Veery. Young are fed insects and possibly some fruit.

### ***Diet***

Eats beetles of all kinds, weevils, ants, wild bees, wasps, caterpillars, spruce bud moths, mosquitoes, crane flies, treehoppers, cicadas, and also spiders, millipedes, snails, sowbugs, earthworms, domestic and wild cherries, blackberries, raspberries, seeds of twinberry, and elderberry. Becomes more frugivorous during late summer, fall, and winter.

### ***Behavior and displays***

- Often sings from a high perch, but forages on or near the ground.
- May flick its wings and raise its crest when agitated, but rarely raises and lowers its tail like the Hermit Thrush.
- When performing an agonistic display (a behavior used to threaten another bird) the bird draws its head back, raises its bill at approximately a 45° angle while moving its bill slightly to the side.

### ***Courtship***

- No information.

### ***Nesting***

**Nest site:** Usually built in a small fir, spruce, hemlock, vine maple, alder, or willow, on a horizontal branch near the trunk.

**Height:** Typically 4–7 feet (1.2–2 meters) above ground; recorded from 0.5–60 feet (0.2–18 meters).

**Nest:** Bulky, well-made cup of twigs, mosses, bark, grasses, rootlets, wet leaves; lined with lichens, plant fibers, skeletonized leaves, and sometimes animal hair. Often concealed with outer covering of live green moss. More elaborately and neatly constructed than those of other thrushes. The female builds the nest in about 4 days.

**Eggs:** 3–5, usually 4. Pale blue, evenly spotted with brown, generally more brown about the larger end. Oval with a smooth shell and very little gloss.

**Incubation period:** Incubation by the female alone, lasts approximately 12–13 days. Incubation begins after the third egg is laid.

**Nestling period:** Young are altricial (born naked or with a small amount of down, eyes closed, unable to move or feed themselves). The young are fed by both parents, at first by regurgitation and by bringing them small insects. Gradually the insects become larger and some fruit may be substituted if insect prey is not as abundant. They are brooded by the female for the first few days. The nestling's eyes open at 2–3 days, the feather plumes erupt from the sheaths at 7–10 days, and the young leave the nest at 10–12 days.

**Fledgling period:** Fledglings have been observed as late as August 10. Little is known of their habits between fledging and fall migration.

**Broods:** Single brooded.

**Cowbird Parasitism:** Occasionally a host to cowbirds, around a dozen documented cases.

# HERMIT THRUSH (*Catharus guttatus*)

## Distribution

**Breeding:** From Alaska, central Yukon, north-central Saskatchewan, Manitoba, Ontario, south-central Quebec and Labrador, Newfoundland, and Nova Scotia; south to the mountains of southern California, Arizona, southern New Mexico, and extreme western Texas. The upper Midwest, north-central and northeastern Minnesota, central Wisconsin, north-central Michigan and in the East to the mountains of West Virginia and Maryland, and along the Atlantic coastal plain to Long Island and central New Jersey.

**Winter:** Southern United States, northeast to southern New England and south to Guatemala and El Salvador.

## Breeding habitat

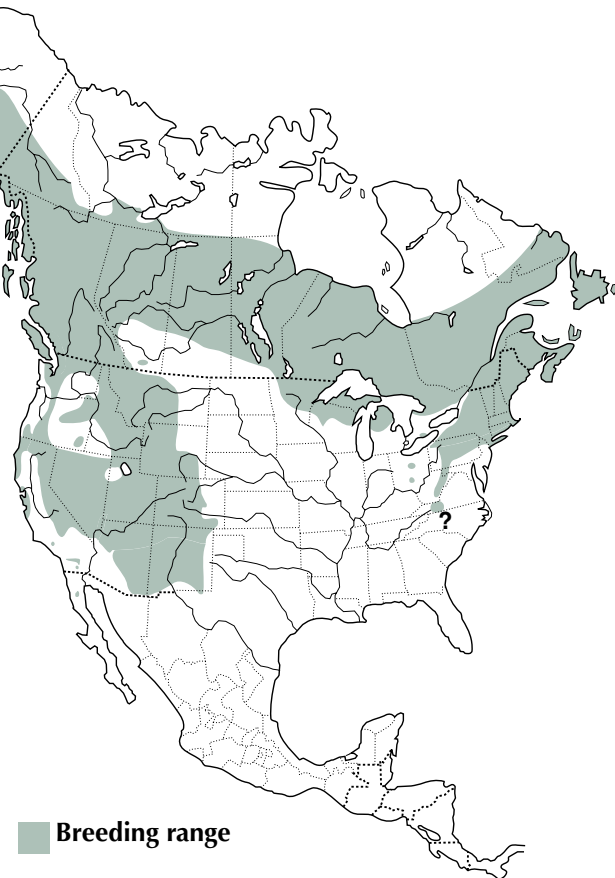
Inhabits a variety of coniferous and mixed conifer-hardwood forests up to approximately 4,000 feet (1,220 meters) in the northern Appalachians and up to the tree line in the Western Mountains. Surveys in Michigan found a preference for dry coniferous forests such as jack-pine plains and conifer plantations, as well as mesic mixed forest types dominated by northern hardwoods and spruce. Also favor edges such as the margins of lakes, clearings, burns, and second-growth areas rather than the interior of mature stands of trees. There is some overlap with Veeries and Swainson's Thrushes, but Veeries generally prefer wetter, more deciduous woodlands, and Swainson's Thrushes tend to breed more within the forest interior.

## Conservation status

Among the forest thrushes, the Hermit Thrush is the one species that shows stable or even increasing population trends throughout its large range. It is seemingly tolerant of various disturbances, but in many areas it is a species associated with large and mature forests. Why this species is successful while other closely related thrushes are declining is one of the mysteries we are trying to understand through the BFL study.

## Description

**Male:** The upperparts vary according to region, from olive-brown to gray-brown. The reddish tail is the most distinguishing feature of the Hermit Thrush. Conspicuous white eye-ring and a spotted buffy or whitish breast. The eastern forms have buff-brown



flanks, the western mountain forms are larger and paler, and the Pacific Coast forms are smaller with grayish flanks.

**Female:** Same as male.

**Juvenile:** Feathers on the back, tail, and head have buffy edges; breast and flanks faintly barred.

## Vocalizations

**Song:** A beautiful flute-like song made up of a series of varied phrases, separated by long pauses. Each of its phrases begins with a long, clear introductory note, followed by a variable series of shorter notes. The phrases vary considerably in pitch and seem to drift or trail off at the end of each phrase. Clearer and often higher pitched than the Wood Thrush's song.

**Calls:** Two common call notes: a soft *chuck* or *chup* and a harsh, rising *wee-er*, similar to the call of a catbird. Given as an alarm or when the bird is agitated.



## Foraging strategy

Forages mostly on the ground by hopping and then stopping abruptly to scan for prey. Turns fallen leaves over with bill to search for food. Also gleans from foliage and branches in the understory and in young saplings, occasionally much higher up in the trees. Sometimes takes insects or berries from vegetation above the ground while hovering.

## Diet

Eats mostly beetles, ants, caterpillars, grasshoppers, crickets, spiders, sow bugs, snails, earthworms, and sometimes salamanders. In the fall and winter eats more fruit: pokeberries, serviceberries, grapes, elderberries, mistletoe berries, and raspberries.

## Behavior and displays

- Often sings from a high, exposed perch. Begins singing in the pre-dawn and sings past dusk.
- Incessantly flicks wings, a behavior that distinguishes this species from other forest thrushes.
- “Wing flash”: stands erect and orients wing or wings toward another bird. Flashes the wing quickly, displaying a buffy wing-stripe, and then flees.
- Raises and lowers its tail after alighting or when alarmed.
- When performing an agonistic display (a behavior used to threaten another bird), the bird holds its body in a sleek, erect posture with the bill pointing upwards, raised crest, and flicking wings.
- Has been observed “anting.” Anting occurs when a bird picks up a single ant, or group of ants and rubs them on its feathers. The purpose of this behavior is not well understood. It is thought that birds may be able to acquire defensive secretions from the ant possibly used for some medicinal purpose. Also may be a supplement to the birds own preen oil.

## Courtship

- Wild, circular courtship flights within territory, with the male chasing the female. In 1–2 days the flights become more leisurely.

## Nesting

**Nest Site:** In the East, usually on the ground well hidden under a small tree, bush, fern, or in a natural depression. In the West generally nests above ground in a tree or shrub, conifer sapling, or on top of a stump or log. There are some accounts of nests under the eaves of a building or on a rock ledge. Generally found near an edge or gap rather than in the interior of a forest.

**Height:** On the ground or typically an average of 2–8 feet (0.5–2.4 meters) above ground, has been recorded from 1.5 to 30 feet (0.5–9 meters).

**Nest:** The female builds the nest alone. Compact but bulky nest made of twigs, bark strips, mosses, ferns, and grasses. Lined with conifer needles, rootlets, and plant fibers.

**Eggs:** 3–4, oval or long oval. Pale blue, typically unmarked with a slight gloss. Similar to the eggs of the Veery, but paler blue.

**Incubation period:** Incubation by the female alone for 12–13 days. Male feeds the female on the nest. Male also guards his territory by perching on a dead snag or a branch of a conifer about 40 feet (12 meters) from the nest and sings frequently.

**Nestling period:** Nestlings altricial (born naked or with a small amount of down, eyes closed, unable to move or feed themselves). Parents both feed the young and keep the nest clean. Eyes open at 3–4 days, feather plumes erupt from the sheaths at 7 days, and young leave the nest after 10–12 days.

**Fledgling period:** Parents coax young to leap from the nest to the ground to be fed upon first fledging. No information on how long the parents feed the young out of the nest.

**Broods:** Double brooded. A study done in Massachusetts found that they are sometimes triple-brooded.

**Cowbird Parasitism:** Parasitised by cowbirds, but more information is needed concerning the effect of brood parasitism.

# VARIED THRUSH

## (*Ixoreus naevius*)

### Distribution

**Breeding:** Pacific Northwest, from Alaska to northern Yukon, British Columbia, western MacKenzie, and southwestern Alberta, south to northwestern Montana, northern Idaho, northwestern Washington, western Oregon, and the northwestern corner of California.

**Winter:** From southern British Columbia to northern Baja. Wanderers are seen as far east as New England, with records from virtually every state in the U.S.

### Breeding habitat

Inhabits mostly coniferous forests, such as redwoods, Douglas fir, and spruce, but also inhabits some deciduous forests, from coastal to subalpine, usually with a dense understory. Favors thick stands of firs, wet with moisture, preferably near mountain lakes. This thrush loves shady, cool, and damp woodland areas.

### Conservation status

This thrush is of moderate conservation importance, primarily because of its association with mature coniferous forests of the Pacific Northwest, and because of its relatively small total range. Populations appear to be stable at present, although they fluctuate greatly in many areas. Understanding this species' relationship with forest fragmentation in various silvicultural practices will be important for conserving future populations.

### Description

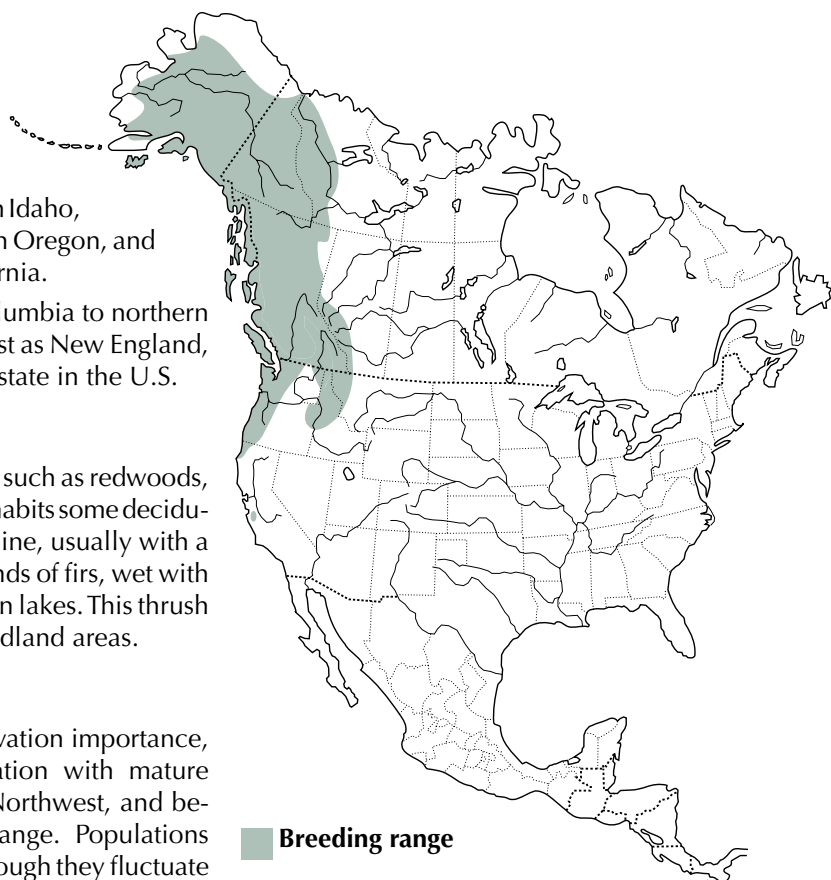
**Male:** The upperparts are slate-gray, with an orange eyebrow line and wing bars. Underparts are orange, with a black breast band. The outer tail feathers have white tips.

**Female:** Similar in pattern to the adult male, but much paler and duller. Nape and back are brownish-olive with a breast band similar or paler in color.

**Juvenile:** Throat and breast are orange; feathers tipped with olive, giving a scaly appearance. The breast band is not visible.

### Vocalizations

**Song:** Each song phrase is a single note: a long, vibrating, metallic whistle, with a long pause between the notes. Each note is delivered in a slightly different key and pitch, with no particular order to these changes.



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A bird may sing these notes in continuous succession for several minutes. During May and June this bird is heard at its best; its song carries long distances through the forest.

**Calls:** Low *chook* (robin-like note) and a variety of ringing whistles similar to the notes in the bird's song. The bird will often call in a soft, faint tone while feeding on the ground.

### Foraging strategy

Commonly forages on the ground under damp and thickly matted leaves. Scratches the dead leaves aside with both feet at once like a White-throated Sparrow, seizing some litter in its beak and scattering leaves in various directions. Generally keeps under shady retreats among mosses and rocks. Occasionally will glean or pick invertebrates or fruit from vegetation. Young are fed an animal diet almost exclusively.

(Continued)

## *Diet*

Eats beetles, ants, bees, wasps, flies, caterpillars, grasshoppers, crickets, some spiders, myriapods, snails, sowbugs, and earthworms. In the early fall feeds mostly on acorns, weed seeds, snowberries, juniper berries, blackberries, blueberries, raspberries, buckthorn, poison oak, and pepperberries.

## *Behavior and displays*

- Sings from high, concealed perches; often flushed from the ground into a low tree.
- On its breeding ground it is generally a shy bird, fading away into the dense understory at any sign of an intruder.
- When performing an agonistic display (a behavior used to threaten another bird), the bird extends its head forward with its body held in a horizontal crouch and with its plumage sleeked. At highest intensity the tail is lifted and the wings are spread and rotated forward.

## *Courtship*

- No information.

## *Nesting*

**Nest Site:** Usually in a small conifer, but occasionally built in a deciduous tree; small fir, spruce hemlock, vine maple, or willow. The nest is generally built against the trunk, supported by small branches and hidden in the foliage.

**Height:** 6–20 feet (2–6 meters) above the ground.

**Nest:** The nest is a bulky cup of mud, dead leaves, dried twigs, inner bark strips, weed and grass stems, and soft moss. It is lined with fine dry grasses. The female is thought to build the nest by herself.

**Eggs:** Generally 3–4, but may range from 2–5. Smooth and glossy, pale blue, sparingly dotted with brown. Somewhat paler than a robin's egg.

**Incubation period:** Incubation is done by the female alone, for about 14 days. The male is always present in the vicinity and may possibly feed the female on the nest.

**Nestling period:** The nestlings are altricial (born naked or with a small amount of down, eyes closed, unable to move or feed themselves). The female broods the nestlings for a few days after they hatch. The actual length of the brooding period is not known.

**Fledgling period:** Both the female and male help feed the young until they are ready to feed themselves completely.

**Broods:** One brood per season, possibly two.

**Cowbird Parasitism:** No information; possible cowbird host.

# BLACK-THROATED GRAY WARBLER

## (*Dendroica nigrescens*)

### Distribution

**Breeding:** Extends from south-western British Columbia, western Washington, and central Oregon across southern Idaho to western Wyoming, south (primarily in the mountains) to Arizona, southern New Mexico, northern Baja California, and northeastern Sonora, Mexico.

**Winter:** Primarily Mexico, found in Baja California Sur and the Pacific Slope and interior of Sonora, Durango, Zacatecas, and Coahuila south to central Oaxaca. Winters in small numbers in California and southern Arizona; casually along Gulf Coast of U.S.

### Breeding habitat

Breeds in a variety of semi-arid woodlands, dry, open forests, and chaparral. In the Pacific Northwest, birds occur in deciduous and coniferous secondary growth in old clear cuts and burns, as well as in mature or old growth forests. Breeds at higher elevations in the rest of the range, preferring dry, open woodlands (e.g. pinyon-juniper, valley-foothill hardwood-conifer, and montane hardwood habitats); often associated with oaks throughout its range.

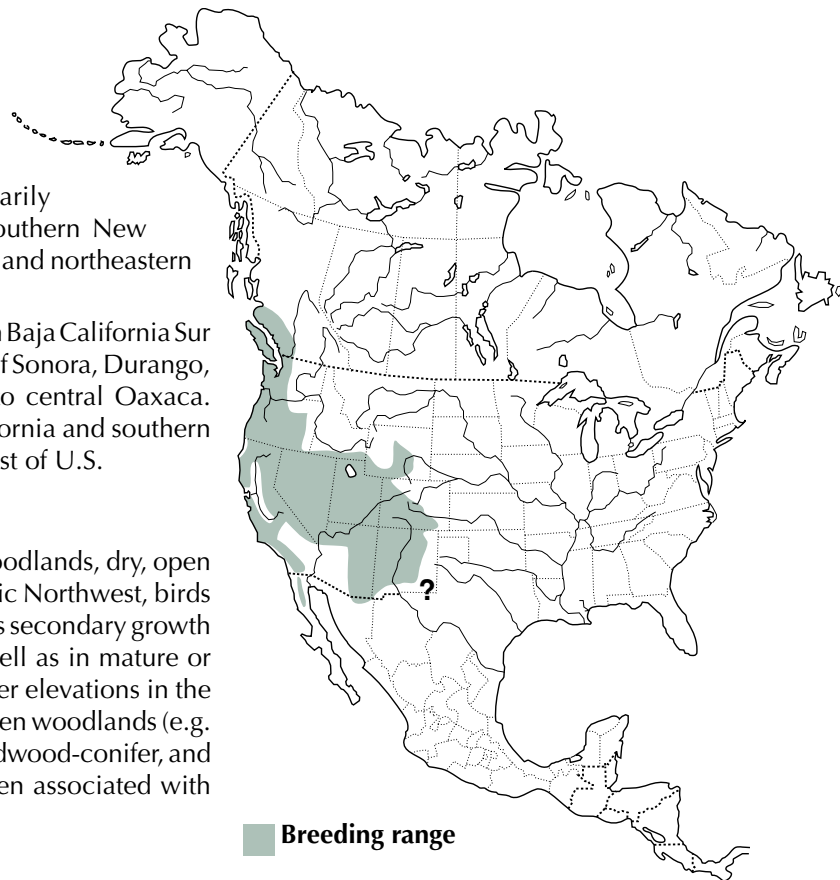
### Conservation status

This warbler is of moderate conservation importance, because of its relatively small and patchy breeding and wintering distributions. Populations appear to be stable at present, and this species may be relatively tolerant of silvicultural practices and other disturbance. Little is known, however, about its specific habitat requirements or sensitivity to largescale land-use practices in the western United States.

### Description

**Male:** Gray above and white below, with a bold face pattern. Purely black chin, throat, cheek patch, and crown, set off by a white superciliary and crescent-shaped cheek patch; also black streaks on sides of breast and flanks. A yellow loreal spot (between the eye and the beak) stands out, as do the two white wing bars easily seen on the gray wings.

**Female:** Similar to adult male, but the black areas on the head are more grayish. Instead of a black throat, a band of gray extends from the neck across the lower throat, although some females can show black extending on the throat resembling males. Also shows two white wing-bars and yellow loreal spot.



Breeding range

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**Juvenile:** Upperparts are dull-brown with a dark crown and broad, dull, whitish eyebrow. Underparts are dull gray, becoming whiter on the belly; a hint of the white wing bars and white in the tail may be visible.

### Vocalizations

**Songs:** Two types of primary song are known. The female is not known to sing.

**Type 1 song:** More common in early breeding season when male is close to female, decreases in frequency after mating. It consists of 5–9 buzzy notes, full of “zee”s, having a crescendo effect with an emphatic ending: zee-zee-zee-zee-bzz-ZEE, zee-zee-zee-eeCHEW.

**Type 2 song:** Given in interactions with other males and become more common later in breeding season. Buzzy like the Type 1 song, they are given at a faster rate and are more variable, often lacking the inflected ending.

**Calls:** A sharp, nontonal *thick* or *tup*. A high *sip*, or *see*, is given in flight.

## ***Foraging strategy***

Forages at mid-levels in the canopy, primarily foliage gleaning, with occasional hover-gleaning and rarely flycatching.

## ***Diet***

Insectivorous, only “small, green caterpillars” specifically mentioned as a common prey item. Also known to eat ants.

## ***Behavior and displays***

- Territories are established by male, which sings from prominent perches to advertise boundaries to conspecific males; intruders are chased out of territory when found.

## ***Courtship***

- No information.

## ***Nesting***

**Nest Site:** Little information, but generally in trees or shrubs 3–32 feet (1–10 meters) above ground. In trees, nests placed well out on limbs. Nests have been found in pinyon pine, (northern New Mexico), on a horizontal branches 3.5–10 feet (1.2–3.0 meters) from the trunk of oaks or junipers (southeastern Arizona), on horizontal branches of fir or in crotches of an oak (Washington and Oregon).

**Height:** Generally low, but can range from 3–35 feet (0.9–10.7 meters) above ground.

**Nest:** Male never observed assisting building nest, but may follow female and scold almost continuously. The deep, compact cup nest constructed of grasses, bark, and dead forb stalks, often lined with feathers and hair of cattle.

**Eggs:** 3–5, usually 4, white, creamy-white, or greenish-white eggs are speckled, dotted, or blotched with reddish brown and umber.

**Incubation period:** Little information, incubation is done by female alone.

**Nestling period:** Appearance not described, but young are altricial and nidicolous (helpless, nearly naked confined to nest). Young are tended by both parents.

**Fledgling period:** Young leave nest, apparently in response to alarm calls of female, when nest closely approached for photography. No other information.

**Broods:** Double brooded in at least some parts of the breeding range.

**Cowbird Parasitism:** Rare host of the Brown-headed Cowbird, only 20–30 records.



# HERMIT WARBLER

## (*Dendroica occidentalis*)

### Distribution

**Breeding:** Southwestern Washington south through Sierra Nevada of California and west-central Nevada, and south to central California coastal mountains. Populations are fragmented within the range. Hybrid zone with Townsend's Warbler in area of overlap in Oregon and Washington.

**Winter:** Primarily in Mexico and Central America, from Durango and southern Nuevo Leon south through Oaxaca and Chiapas to Guatemala, and southern Honduras to western Nicaragua. Rare and local in coastal central and southern California and in west-central Nicaragua and Costa Rica; accidental to western Panama. Highest densities occur in Central Volcanic Belt of Mexico.

### Breeding habitat

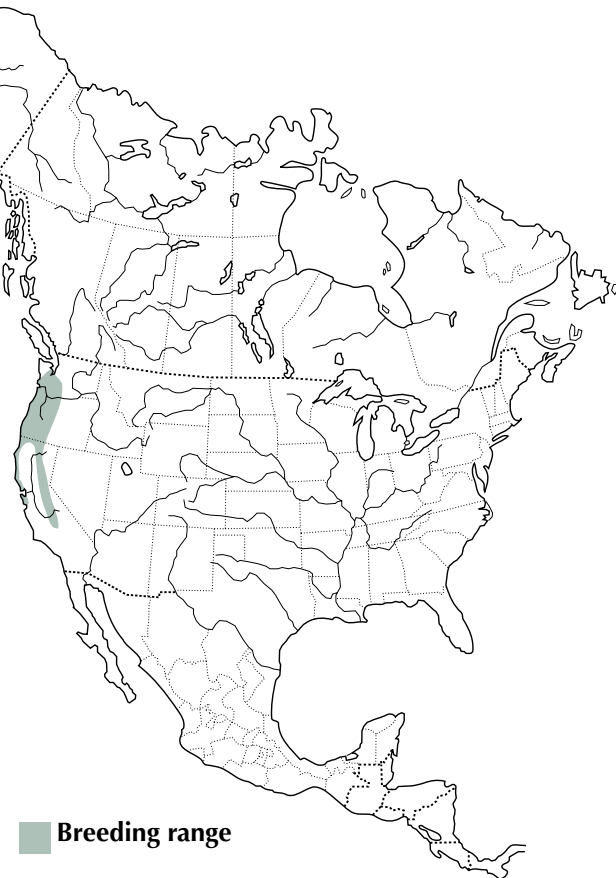
Pacific northwestern coniferous forests with a high canopy volume, generally preferring mature stands of pine and Douglas fir. Douglas fir is an important tree species throughout the breeding range, also found in lower densities in subalpine forests dominated by subalpine fir, lodgepole pine, and other conifers. In the California mountains, found in forests of red and white fir, sugar, Ponderosa, Jeffrey, and lodgepole pine, and giant sequoia. Avoids areas with a high deciduous volume; absent from riparian areas and clearcuts.

### Conservation status

This species is of high conservation importance, because of its small overall distribution and association with mature coniferous forests in the Pacific Northwest. Although somewhat tolerant of second-growth forests, the Hermit Warbler is vulnerable to largescale forest clearing. Its precise habitat requirements and sensitivity to forest fragmentation throughout its range are poorly known. Populations are poorly monitored, but appear to be stable at present.

### Description

**Male:** Bright yellow on face, crown, and cheek patch, variable black on nape, otherwise grayish or olive-gray upperparts spotted with black. Throat and chin black, underparts white with limited streaking (or absent) on flanks, two prominent white wing bars.



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**Female:** A dingier version of the male, cheek has a dark tinge, variable black spotting on crown. Black on throat is limited, sometimes absent, sometimes extensive but not including chin. White wing bars prominent.

**Juvenile:** Head and upperparts olive-brown, only a hint of streaking, cheek area darker than adults. Throat and breast are grayish-brown, belly white.

**Hybrids:** Hermit x Townsend's Warblers occur regularly in Oregon and Washington. Hybrids typically show head pattern of Hermits with Townsend's body coloring (some yellow on the breast below the black throat and streaking on the flanks). More rarely, hybrids may show the face pattern of the Townsend's with the coloring of a Hermit's body (no yellow on the breast and only limited streaking on the sides).

### Vocalizations

**Songs:** Only male sings. Two distinct song types, but exact pattern extremely variable.

First-category songs dominate singing early in breeding season, before males are mated, and decline after

pairing. They typically consist of 4 high-pitched notes, *che che che che*, followed by a descending phrase, *cheeo*, then a rapid series of buzzy notes, *ze ze ze ze ze ze*, and a final high-pitched note, *ZEET*.

Second-category song dominates after pairing and typically consists of 3 or 4 doubled, buzzy notes, *zeegle zeegle zeegle*; followed by rising-and-falling ending phrase, *zee-o-seet*.

**Calls:** A flat *chip* or *tip*, nearly indistinguishable from that of Townsend's and Black-throated Green warblers. Both male and female give the chip note.

### Foraging strategy

Moves through canopy and sub-canopy gleaning insect prey from foliage in middle and outer portion of tree branches. While foliage-gleaning is the primary strategy, hover-gleaning, lunging, and sallying for aerial prey are occasionally exhibited. Usually forages alone, although members of pair occasionally forage together.

### Diet

Primarily invertebrates, including small spiders, caterpillars, beetles, flies, wasps, stone flies, and true bugs.

### Behavior and displays

- Movement within foliage is mostly by hopping, but flies within or between trees. Direct flight consists of rapid short wing-beats and occasional short glides.
- Hover flight is used in conflict with other males or while gleaning food off branches.
- Breeding male spends much of the morning singing from high perches in favorable weather conditions and in the subcanopy under rainy conditions.

### Courtship

- No information.

## Nesting

**Nest Site:** Nests in older second-growth and mature forests, typically saddling the nest on the upper surface of a conifer branch, preferring pine, cedar, and Douglas fir. Often nests in trees that are well over 165 feet (50 meters) tall, placing the nest on a limb 13 feet (4 meters) out from the trunk. One exceptional nest was located on the ground at the base of a shrub.

**Height:** Average height is 23 feet (7 meters) above ground.

**Nest:** Females have been observed carrying nesting material, but no bird has been observed building a nest. The cup-shaped nest is constructed from fine twigs, rootlets, dry moss, bark (especially from cedar), pine needles, and spider silk; lined with fine plant fibers, hair, feathers, and down from cottonwood trees.

**Eggs:** 3–5 creamy white eggs are finely speckled and spotted with chestnut and auburn with intermingling spots of light brownish drab.

**Incubation period:** Little known, young hatch about day 12.

**Nestling period:** Nestlings are altricial and downy. Male and female both tend to the young at equal rates, with caterpillars the main food item.

**Fledgling period:** Little known, but in 1 nest observed on day of fledging, all young were within 10 feet (3 meters) of each other in the shrub layer directly below nest. The following day, the young were in the canopy approximately 32–50 feet (10–15 meters) above ground in 2 adjacent trees on natal territory, and both adults were feeding. Adults split broods within a few days of fledging; 1–2 young go with each parent. Within 2 days the young were capable of following adults through canopy.

**Broods:** No information.

**Cowbird Parasitism:** A rare host of the Brown-headed Cowbird.

### Notes

- Male guards female closely during egg-laying, presumably as strategy to avoid extra-pair copulation.

# TOWNSEND'S WARBLER

## (*Dendroica townsendi*)

### Distribution

**Breeding:** Breeding range extends from southern Alaska along the Pacific Coast to northern Washington; inland from southern Yukon south to western Montana, central Idaho, and Cascade Mountains of central Oregon.

**Winter:** Winters primarily in highlands of Mexico, south to Nicaragua, and rarely to Costa Rica. A small population winters along Pacific coast from west-central Washington south to southern California.

### Breeding habitat

Inhabits dense, moist, and shaded forests composed of towering conifers. The dominant tree species varies within the range, but consists of spruce, Douglas fir, Lodgepole pine, and hemlock. As this species nests and forages in the upper canopy, the undergrowth characteristics seem to be less important. They may be uncommon or patchy in dense rain forests (e.g., the west side of the Olympic Peninsula in Washington) and in more open and subalpine coniferous woodlands.

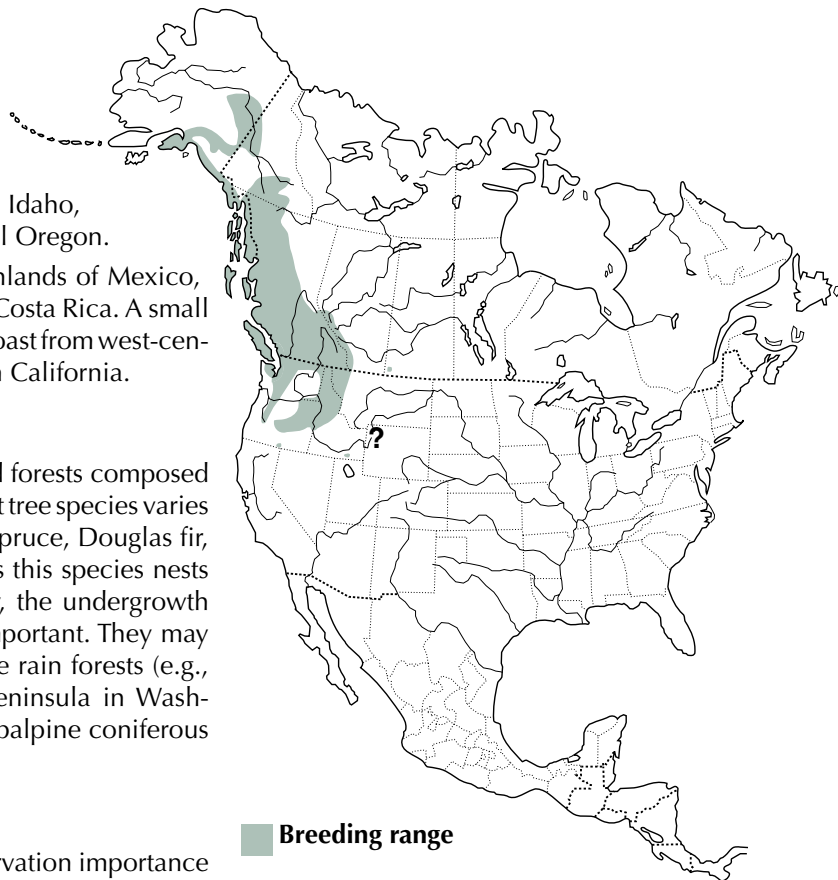
### Conservation status

This species is of moderate conservation importance because of its relatively small distribution and association with commercially valuable coniferous forests in the Pacific Northwest. Populations are poorly monitored but appear to be stable at present. Understanding this warbler's sensitivity to forest fragmentation and the conversion of remaining old-growth forests will be important in conserving future populations.

### Description

**Male:** Medium-sized, small-billed, warbler with a striking black and yellow pattern on head and underparts. Crown, cheeks, chin, and throat are solid black, the rest of the head (eyebrow and malar region) are bright yellow, including a small arc underneath the eye. Breast is bright yellow, belly and flanks are white, strong black streaks on sides and flanks. The back is yellow-olive with heavy black streaking.

**Female:** Pattern is similar to the adult male, the most obvious differences are the reduced amount of black on the yellow throat and chin, the olive (not black) crown and cheek patches, the finer streaking on the sides and flanks, and less spotting on the back.



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**Juvenile:** Olive-brown above with a dull, buffy eyebrow and a brownish-olive cheek patch. Below, dull-white with dusky smudging on the throat and dusky streaks on the flanks.

**Hybrids:** Hermit x Townsend's Warblers occur regularly in Oregon and Washington. Hybrids typically show head pattern of Hermits with Townsend's body coloring (some yellow on the breast below the black throat and streaking on the flanks). More rarely, hybrids may show the face pattern of the Townsend's with the coloring of a Hermit's body (no yellow on the breast and only limited streaking on the sides).

### Vocalizations

**Songs:** A high, wheezy, zwee zwee zwee zwee sweezit. The song rises in pitch then often drops at the end; the pattern is quite variable. An alternate song begins with a rapid series of short, slightly buzzy notes and concludes with more typical raspy notes: zi-zi-zi-zi-zi, zwee zwee.

**Calls:** Very similar to Black-throated Green or Hermit warblers, but slightly sharper and higher: *tip* or *tsik*. The *Flight note* is a thin, high see, lacking any buzzy quality.

### ***Foraging strategy***

Birds on the breeding grounds are difficult to observe, as they spend most of their time high in the crowns of tall conifers. Typically, insects are gleaned from clumps of conifer foliage and leaf surfaces of deciduous trees, either while perched on the branch or while hovering; occasionally flying insects are caught in the air. In winter, this species often forages close to or on the ground.

### ***Diet***

Almost exclusively insects and spiders, including caterpillars, moths, winged insects, and other invertebrates commonly found on coniferous and deciduous foliage; Spruce Budworm important where present. Will come to feeders for suet, nuts, and fruit; in low-latitude cloud forests, will feed on honey dew excreted by scale insects.

### ***Behavior and displays***

- Individuals observed hopping on ground while bathing or drinking, also hops through foliage during singing or foraging bouts and while constructing and visiting nest.
- Hovers while collecting nesting material and when engaging in fights with conspecifics of same sex.
- Newly arrived males establishing territories may also engage in flight chases, where one male chases the other in fast flight over a large elliptical route without vocalization.
- Males defend territories against Hermit Warblers as well as other Townsend's Warblers.

### ***Courtship***

- Males typically call or sing softly and infrequently while remaining close to newly acquired mates.

- While perched, male may approach female with his head lowered and forward, wings slightly open and drooped, and tail slightly flared.
- Males are aggressive in guarding mates from intruding males, particularly through egg-laying period.

### ***Nesting***

**Nest Site:** Nests almost exclusively in conifers, particularly firs and spruce. The nest is typically placed on a main limb or in a group of branchlets, where the nest is well concealed by foliage; does not typically place nest in a fork or crotch. Preferred sites are in areas of old growth with towering trees, no preferences for understory characteristics

**Height:** Nests are built high in conifers, exceptionally as low as 10 feet (3 meters). and as high as 100 feet (30 meters).

**Nest:** A bulky but shallow cup of plant fibers, slender twigs, and bark woven together; cup is lined with moss, plant downs, and hair. Not known whether the male helps build.

**Eggs:** 3–5 smooth and slightly glossy eggs are speckled and spotted with chestnut-red, brown, and brownish-or purplish-gray.

**Incubation period:** Incubation by female alone, usually lasting 11–14 days from clutch completion to the hatching of the last egg.

**Nestling period:** Both parents feed nestlings, male feeds young while female brooding. Young leave nest 8–11 days after hatching.

**Fledgling period:** On day of fledging, young typically are within 80 feet (25 meters) of nest. Usually observed in or under dense vegetation on ground or in shrub layer, but occasionally observed in trees near nest. Parents appear to split brood, each provisioning 1–3 young with food.

**Broods:** No information.

**Cowbird Parasitism:** A known cowbird host, but little information on frequency of parasitism, success of parasite, or response to parasitic mother, eggs, or nestlings.

# COOPER'S HAWK (*Accipiter cooperii*)

## Distribution

**Breeding:** Southern Canada, south through most of the United States to central Florida and northern Mexico. It has a more southern distribution than other North American accipiters. May be absent from treeless areas of the Great Plains.

**Winter:** In southern part of range, may be resident year round, but northerly populations are more migratory. Partial migration may exist in this species, with males remaining on or near their territories year-round, and females and younger birds migrating as far south as Florida, Mexico, and Central America.

## Breeding habitat

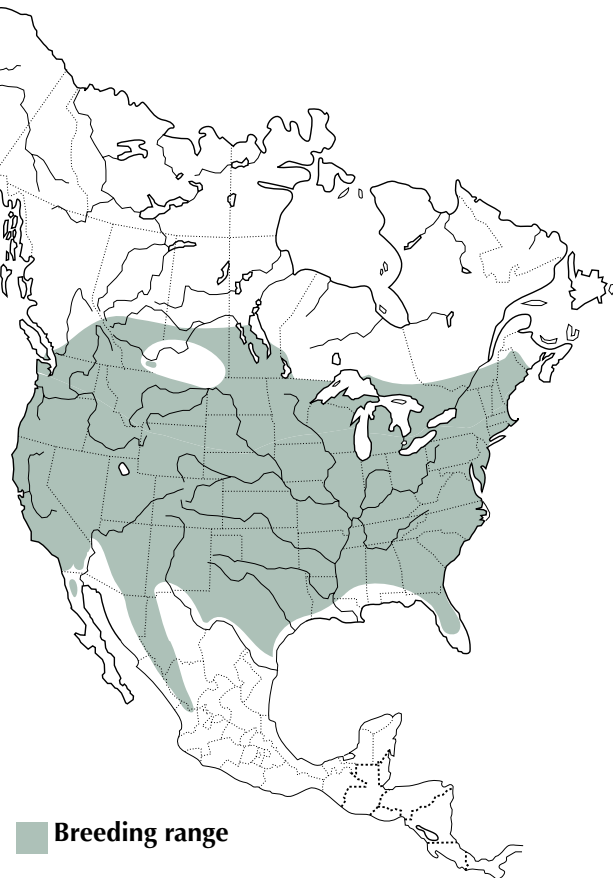
Coniferous, deciduous, and mixed forests. May prefer more open or patchy landscapes such as woodlots, riparian forests, or forested patches in a matrix of farmland. May also prefer open stands of trees rather than dense continuous stands. Often found near forest openings or edges, and near a stream, lake, or other body of water. It is unclear how tolerant the Cooper's Hawk is of human disturbance, but there are an increasing number of reports of successful nestings in suburban or urban areas.

## Conservation status

Being a representative top predator in many parts of North America, the Cooper's Hawk is of moderate conservation importance and is on the threatened or special concern list for many states. This species seems tolerant of human activity and habitat modification, although the precise habitat and area requirements in many parts of its range are poorly known. Although this species is poorly monitored on its breeding grounds, overall populations appear to be stable, with some increases noted in eastern regions and possible declines in many parts of the West.

## Description

Medium-sized (crow or grouse), forest-dwelling accipiter with a long, narrow tail and short rounded wings. Marked reverse sexual size dimorphism, with males weighing about 65% of females. Tail noticeably rounded at tip, with tail feathers progressively shorter, outward from central pair. Tail also has alternating light and dark bands with a wide white terminal band. May soar during mornings, migration, and displays, but most flight is active, with periods of flapping al-



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ternating with short glides. In flight, appears to be a "long-necked" accipiter, with head extending forward well beyond the leading edge of wings. Legs appear relatively thick when perched.

**Male:** Dark-brown to slate-gray back, with a darker gray to black crown that contrasts with the lighter nape. Finely barred rufous underparts. Undertail coverts pure white. Iris color varies from deep reddish- orange to red. Legs and cere yellow.

**Female:** Same coloration as male, but larger.

**Juvenile:** Attains adult plumage in second year; hatch-year birds wear juvenal plumage through first winter. Back and upper-wings medium brown, head with dark-brown crown. Underparts creamy white with fine dark-brown streaking, undertail coverts white. Iris color greenish-yellow to yellow; cere yellow; legs greenish-yellow.

## Vocalizations

**Song:** None.

**Calls:** Does not call frequently, except during breeding season, and has a small repertoire of vocalizations.



Most common call is the *kek-kek-kek* alarm call that may be given by either sex. This call is also sometimes given by both members of a “duetting” pair during breeding season or during displays. Female has two recognized calls: a soft *ki* or *krrr* that may serve to indicate the location of female and a louder “wail” call. Juveniles may give a begging call or “hunger shriek,” which sounds like a thinner, higher pitched version of the adult wail call. This call may be given by several juveniles at once, and may also be used by fledglings that have left the nest but are still dependent on parental feeding.

### ***Foraging strategy***

Most prey is taken while “still-hunting” from ambush or by stealthy approach flights that take advantage of landscape features to hide the approaching hawk from its prey until the last second. This may entail a twisting, circuitous flight at high speeds and low levels. Cooper’s Hawks are superb and powerful flyers, capable of rapid flight through dense vegetation. Prey may be taken on the ground, in flight, or in trees or bushes. May even pursue prey into dense underbrush on foot.

### ***Diet***

Up to 80% of prey taken may be birds, with the remainder mostly mammals. Proportion of mammalian prey may increase during breeding season. Avian prey may range in size from warbler species and House Sparrows to Northern Bobwhites or Northern Flickers. Mammalian prey may include various species of squirrels and young cottontail rabbits. Smaller male takes correspondingly smaller prey, with prey weights averaging around 75% of those taken by female.

### ***Behavior and displays***

- Both males and females may engage in “slow flight” territorial displays in which the birds fly with stiff, slow, exaggerated wingbeats while exposing their white undertail coverts. Both sexes may give the *kek-kek-kek* call during these flights.
- The *kek-kek-kek* call, or alarm call, is also used to signal the presence of intruders in the vicinity of the nest.

### ***Courtship***

- Courtship behavior is not well documented. Male probably obtains and defends a breeding territory and attracts a female by calling and performing display flights. Courtship flights begin with both birds soaring on thermals and end with a slow speed chase of female by male. During slow speed chase, both birds alternate periods of extremely slow, exaggerated wingbeats with short glides.

- Courtship feeding has also been reported, in which male brings the perched female partially or fully plucked prey.

### ***Nesting***

**Nest Site:** Nests built in mature trees against the trunk and supported by one or more large branches. Males may show a high degree of territory fidelity, with several old nests located within a radius as small as 300 feet (90 meters).

**Height:** 20–90 feet (6–27 meters).

**Nest:** Substantial platform of large, often fresh, twigs broken from branches. Central cavity lined with bark chips. Males assist in building nest. Old nests of Cooper’s Hawks, crows, and other species may be refurbished and reused.

**Eggs:** Usually 4, with an interval of about 2 days between the laying of each egg. Earliest egg records from most states are around the middle of April.

**Incubation period:** Incubation by female (male does not normally incubate) often begins when third egg is laid and may last from 30–35 days. All eggs tend to hatch within a 2–3 day period.

**Nestling period:** Young remain in nest about 4 weeks, guarded and brooded by female and fed by male who does most of the hunting. During the latter phase of nestling period, female may take an increasingly large part in hunting, leaving young alone in nest. Young normally eject feces over the side of nest; ground and bushes below nest may be liberally splattered with whitewash before young fledge.

**Fledgling period:** Fledglings remain in vicinity of nest and continue to be fed by parents until they are about eight weeks old.

**Broods:** Normally single-brooded; may make another breeding attempt if a nest fails early in the season.

### ***Notes***

- Adult Cooper’s Hawks do not defecate at or near the nest. The female tends to defecate at a plucking post instead. The plucking post, which may be a fence post, stump or fallen tree, is usually located within about 150–200 feet (46–61 meters) of the nest. It may be recognized by an accumulation of feathers from plucked prey and by whitewash splattered on the surrounding area.
- It appears that most males do not breed until their second year; a small proportion of female breeders may be first-year birds in juvenal plumage.

# YELLOW-BILLED CUCKOO

## (*Coccyzus americanus*)

### Distribution

**Breeding:** Widespread in east, occurs in all of the eastern United States and the southern regions of Quebec and Ontario. Once common in portions of the western United States, now restricted to very localized areas in all western states.

**Winter:** Southern Central America and northern South America south to eastern Peru, Bolivia, and northern Argentina. Also found in Trinidad and Tobago; rare in West Indies.

### Breeding habitat

Open woodlands, especially where undergrowth is thick, parks, deciduous riparian woodland, moist thickets, orchards, and overgrown pastures. In the West, check in tall cottonwood and willow riparian woodlands.

### Conservation status

The Yellow-billed Cuckoo is a widespread species that is of moderate conservation concern, primarily because of low overall densities and significant long-term population declines nearly throughout its range. Declines have been precipitous in many areas since 1980. The southwestern population is particularly specialized on mature riparian forests and has been petitioned to be listed as an endangered species. This species is also vulnerable to deforestation in its tropical winter range. Understanding habitat and area requirements of this cuckoo, and how they may vary geographically, will be important for reversing population declines and conserving future populations.

### Description

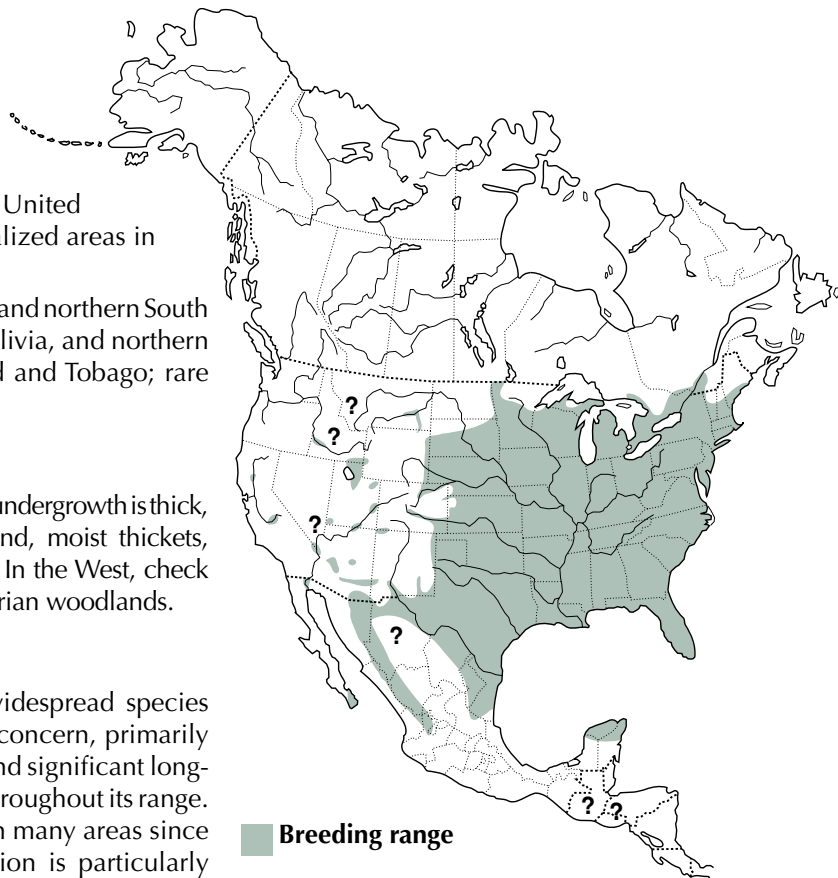
**Male:** A slender and long-tailed bird. Clean white underneath, the white tips on the black tail feathers create distinctive large, white spots on tail. Upperparts are grayish brown, rufous seen in wing; bill largely yellow, also a yellow ring around the eye.

**Female:** Same as adult male.

**Juvenile:** Similar to adults, but paler tail pattern and bill may show little or no yellow. May be confused with Black-billed Cuckoo.

### Vocalizations

**Calls:** At least 6 vocal sounds produced.



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**Kow/p call:** Most frequent call consists of 8–12 guttural, wooden-sounding syllables, *ka-ka-ka-ka-ka-kow-kow-kow/p-kow/p-kow/p-kow/p*. Somewhat louder and more guttural than Black-billed Cuckoo, the *ka* syllables are given more rapidly while *kow/p* syllables are more deliberate and contain longer intervals. May function as a spacing mechanism, and may be given only by male, or at least only male gives call when both birds are present.

**Knocker call:** A harsh, rattled, rapid series of Notes that resembles sound of metal door knocker hitting a strike plate, *kow-kow-kow-kow-kow*. Often repeated several times once initiated.

**Coo call:** 5–11 softly repeated cooing Notes, *coo-coo-coo-coo-coo-coo-coo*. Similar to Coo Call of Greater Roadrunner, but higher pitched and much quieter.

### Foraging strategy

Forages in limbs of trees, often perching inconspicuously while scanning surrounding vegetation waiting for prey to reveal itself by movement. Gleans insects

from leaves and stems while perched, also walks or runs along limbs stretching to capture prey. May hop to a branch located below caterpillar cluster, then fly up, fluttering awkwardly while capturing prey.

## ***Diet***

Primarily large insects, including caterpillars, katydids, cicadas, grasshoppers, and crickets; occasionally small frogs, arboreal lizards, eggs and young birds. Eats fruits and seeds rarely in summer, more frequently on wintering grounds.

## ***Behavior and displays***

- Often perches with back arched and body held low to conceal white breast and belly.
- Moves quietly along branches, disappearing quickly into foliage when disturbed.
- Often freezes when in danger, particularly when Nesting, then moves quietly into dense vegetation where it remains motionless.
- Both adults actively defend the nest and the immediate vicinity.

## ***Courtship***

- “Tail-pumping” display: in precopulatory behavior, female assumes position as if intending to flee, with head and tail elevated. Female then lowers tail so that it points toward ground, then raises it 180 degrees to point straight up; repeats 6–8 times.
- Immediately prior to copulation, male snaps small twig from nearby tree. Flies with twig in bill to land directly on female’s back. Male places twig crosswise in female’s bill by orienting head over her right shoulder.

## ***Nesting***

**Nest Site:** Typically placed on horizontal branch or vertical fork of tree or large shrub.

**Height:** Usually 3–20 feet (1–6 meters) above ground, but ranges as high as 90 feet (27 meters).

**Nest:** Both adults collect twigs from the ground or break off vegetation to build a loose, flat, oblong platform of dry twigs, sparingly lined with dried leaves, strips of bark, and plant tendrils; placed in a tree, shrub, or vine. Nest components are not intertwined; may scatter rim of nest with dried pine needles.

**Eggs:** 1–5, usually 2–3, pale bluish green, eggs are unmarked, fading to light greenish yellow.

**Incubation period:** For 9–11 days both adults incubate equally during day, but the male incubates through the night. Male brings Nesting material each time he relieves female.

**Nestling period:** Young are altricial, but alert and active within 10 minutes of hatching. Both parents brood young, but male generally broods continuously at night; both parents feed young.

**Fledgling period:** Little information; young leave nest at 7–9 days, when nestlings are able to stand for extended periods. Chick leaves nest and runs along supporting limb to meet adult approaching with food; parents feed for a period after fledging.

**Broods:** One brood, occasionally two.

**Cowbird Parasitism:** An occasional host of the Brown-headed Cowbird.

# (SOUTHWEST) WILLOW FLYCATCHER

## (*Empidonax traillii extimus*)

### Distribution

**Breeding:** Willow Flycatchers are widespread across the United States and southern Canada; the distinct Southwestern Willow Flycatcher (*E. t. extimus*) breeds in southern California, Arizona, New Mexico, extreme southern portions of Nevada and Utah, extreme southwest Colorado, and western Texas. Now extirpated from most of its former California range.

**Winter:** From Nayarit and southwestern Oaxaca, Mexico south to Panama and northwestern Colombia.

### Breeding habitat

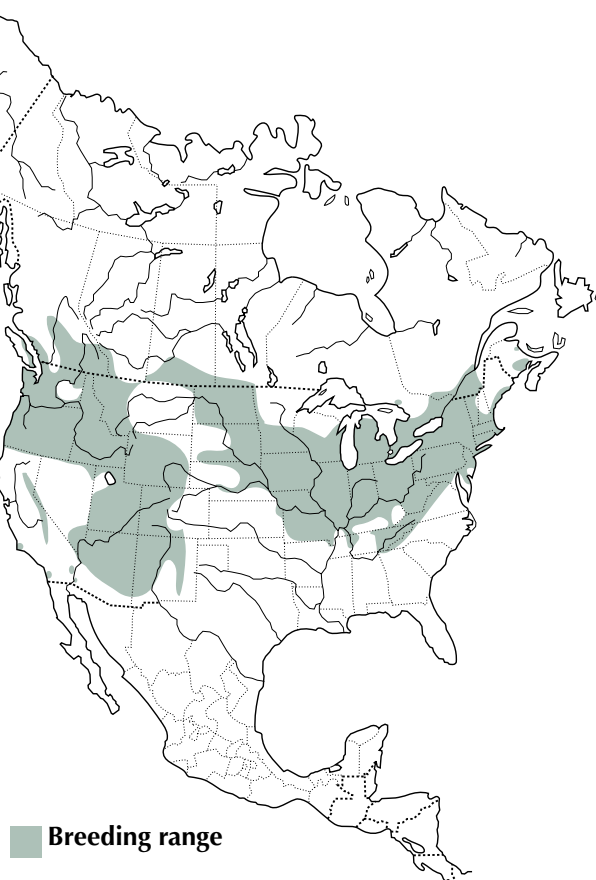
The breeding site must have a water table high enough to support riparian vegetation, and are usually within close proximity (less than 20 yards or 18 meters) of water or very saturated soil in the form of large rivers, smaller streams, springs, or marshes. An important characteristic of the habitat appears to be the presence of dense vegetation, usually throughout all vegetation layers present, e.g. dense growths of willows, seepwillow, or other shrubs and medium-sized trees. There may be an overstory of cottonwood, tamarisk, or other large trees, but this is not always the case.

### Conservation status

Overall, the Willow Flycatcher is a common and widespread species, with populations stable or increasing in the East, but declining in most western regions. The southwestern subspecies (*E. t. extimus*) is of highest conservation concern and is listed as an endangered species. This population is highly restricted to riparian forest stands and is greatly reduced from its historical Distribution. Many efforts are underway to identify and monitor important populations of this subspecies, as well as to determine its precise habitat and area requirements.

### Description

**Male:** Closely resembles the other races of Willow Flycatcher, and several other species of the *Empidonax* genus, particularly the closely related Alder Flycatcher (*Empidonax alnorum*). Roughly the size of a small sparrow, the Willow Flycatcher is overall greenish or brownish gray above, with a white throat that contrasts with a pale olive breast. The belly is pale



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yellow. Two white wing bars are visible, an eye ring is faint or absent. The bill is two-toned, with the upper mandible dark, the lower mandible light.

**Female:** Same as adult male.

**Juvenile:** Little information. Similar to adults, but tend to show buffier wing bars, more yellow on the belly, and slightly more color in the upperparts. These differences fade rapidly.

**Note:** As the *Empidonax* flycatchers are renowned as one of the most difficult groups of birds to distinguish by sight alone, the most reliable way to distinguish the Willow Flycatchers from other similar flycatcher species is not to rely upon its appearance, but rather through its distinct song.

### Vocalizations

**Songs:** A harsh, burry *RITZ-bew*, *RRRITZ-beyew*, or *rrrEEP-yew*, often alternating among these variations, sometimes merely a strong *rrrIP*. Usually rough and low with emphatic rising ending.

**Calls:** Call a thick, liquid *whit*.

## Foraging strategy

Sits and waits on a relatively open perch, like an exposed tree limb, and hawks after flying insects; also gleans insects from foliage while hovering. Occasionally pounces on insects on the ground.

## Diet

Almost exclusively insects, but will eat berries or seeds during certain times of year.

## Behavior and displays

- Most of available time spent sitting or singing, only small amounts of time foraging, flying, at the nest, defending territory, or in courtship.
- Territorial disputes among males frequent before nesting begins, and intruding males may occasionally be attacked by both members of a territorial pair.
- Agonistic behaviors include “tail-flick” and “crest-raise,” also extending breast feathers, flicking wings, flying at other flycatchers to replace them on their perch, and chasing conspecifics.
- Physical contact is rare.
- Advertising song is important in pair-bond establishment and reinforcement. Posture during song is upright, with head thrown back, tail flicked upward, and chest thrown outward.
- In-flight bathing occurs by diving to water surface.

## Courtship

- Pairs and trios engage in vigorous sexual chase during courtship and territorial establishment.

## Nesting

**Nest Site:** Primarily in thickets, especially of willow, though other shrubs or trees are used, near slow streams, standing water, or seeps. Nest placed in a fork or on a horizontal limb of shrub.

**Height:** Average height 24 feet (7.5 meters), but populations of *E. t. extimus* may place nests much higher.

**Nest:** Female weaves nest of forb stems, plant fibers, pine needles, shreds of bark, and dry grasses; outside may contain lichens, paper, cocoons, and shredded grass. Cup is lined with feathers, hair, rootlets, and finer materials.

**Eggs:** 3–4, occasionally 5, creamy white or buff eggs are dotted, blotched with brownish to blackish irregular spots about large end, often in a loose wreath. Southwestern clutches may be smaller than average.

**Incubation period:** Female incubates for 12–15 days.

**Nestling period:** Female broods young, both adults feed, but female plays the major role. Typically direct flight to the nest with food, or to twig near nest. Young leave nest at 12–15 days.

**Fledgling period:** Nestlings may move some distance from nest for short intervals, only to return to nest. For the first few days fledglings often huddle together on the same perch remaining near the nest for 3–4 days, then follow adults through territory until 24–25 days.

**Broods:** Single brooded.

**Cowbird Parasitism:** May incur a high rate of cowbird parasitism.

## Notes

- Song is entirely innate; females sometimes sing territorial song.



# ARIZONA (STRICKLAND'S) WOODPECKER

## (*Picoides arizonae*)

### Distribution

**Year-round range:** In the United States, only occurs in the mountains of extreme southwestern New Mexico and southeastern Arizona. Range extends southward in Mexico through Sierra Madre Occidental of Sonora, Chihuahua, Sinaloa, Durango, Nayarit, Jalisco, Colima, Zacatecas, and Michoaca.

### Breeding habitat

Restricted to Madrean woodland and forests riparian areas, where they are especially dependent on evergreen oaks and adjacent riparian woodland, occur in montane oak or pine-oak habitats. Mostly found between 4,900–5,500 feet (1,500–1,700 meters), but range from 4,000–7,000 feet (1,220–2,130 meters).

### Conservation status

This species is of moderate conservation importance, primarily because of its very limited range and small overall population in the southwestern United States. In southeastern Arizona, as well as throughout its relatively small range in western Mexico, this woodpecker is dependent on healthy oak and riparian forests. Being one of the primary cavity nesters in this area, it is responsible for providing nest sites for a large number of additional species. Its precise habitat and area requirements and how these might vary across its range are very poorly known.

### Description

**Male:** The only solid brown-backed woodpecker in the United States, underparts are white but heavily spotted and barred with brown. Forehead and crown are brown, face is white with a large, brown cheek patch, creating a white eyebrow, a white line from the bill to the neck, and a large, white neck patch. Red patch on hindcrown is distinct

**Female:** Similar to male, but no red patch on hindcrown.

**Juvenile:** Similar to adults, but may show red on top of crown.

### Vocalizations

#### Calls:

**Peep call:** The most common call is given throughout year under a wide variety of circumstances, e.g. when individual is challenging invasion of territory either



Breeding range

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near to or far from nest, or relieving mate at nesting cavity. The long *peep* is characteristic for all subspecies, those of *P. stricklandi* sound exactly like those of *P. arizonae*, and can be confused with call note of Hairy Woodpecker.

**Rattle call:** A loud, long, harsh call, usually 15 notes, and a common call in all disturbance situations. Given regularly by member of mated pair, with mate answering with a *kweek* or rattle call.

**Kweek call:** Similar to the equivalent call of Hairy and White-headed Woodpeckers. Loud, mainly in series but also single notes; mostly be female answering drumming or rattle call.

**Tuk-Tuk-Tuk call:** Given by juveniles as parents arrive with food.

Several other calls have been observed.

### Foraging strategy

Often forages near the ground, flying from higher in tree to base of next tree and works up trunk and onto smaller branches. Works rapidly and then moves to next tree. Unlikely to hammer when feeding, instead climbing trunks of oaks prying, probing and flaking off bark, and then foraging on exposed insects.

### Diet

Poorly known, but seems to consist of larvae and adult insects, especially beetle larvae, fruits, and acorns.

## ***Behavior and displays***

- Actively defends area around the nest from intruding conspecifics; each member of a mated pair is aggressive toward an intruder of its sex, while other member of pair observes the conflict but does not actively engage intruder.

## ***Courtship***

- Courtship displays include a fluttery “gliding” display flight, in which wings are held in place as bird glides toward mate at nest. Male then drums and taps, at the nearly complete cavity.

## ***Nesting***

**Nest Site:** Cavities are usually excavated in dead wood in evergreen oaks, sycamores, maples and cottonwoods; often riparian walnuts, occasionally in agave stalk.

**Height:** Usually 12–20 feet (3.5–6 meters), ranges from 7–50 feet (2–15 meters) above the ground.

**Nest:** Male and possibly female excavate a nest cavity about 12 inches (30 cm) deep, which is unlined.

**Eggs:** 2–4 white egg are laid, probably 1 per day.

**Incubation period:** Incubation is almost continuous, performed by both sexes, and thought to last 14 days.

**Nestling period:** Young are altricial at hatching, and are brooded almost continuously by one or the other parent for several days; feedings are frequent. By day 11 chicks are alert and can hold their heads up; by day 18 the chick can run and jump about.

**Fledgling period:** Nestlings typically leave the nest at 24–27 days, at which time they are fully feathered. Parents bring food to newly fledged young, which follow parents into July; families then break up.

**Broods:** No information, possibly single brooded.

**Cowbird Parasitism:** Not known to occur.

# GREATER PEWEE (*Contopus pertinax*)

## Distribution

**Breeding:** Northern extent of range reaches southwestern United States in southeastern Arizona and southwestern New Mexico, extends south to northern Nicaragua. Because of the topography of the area, range is not continuous, but broken by deep river valleys and low elevation areas.

**Winter:** Pacific slope lowlands from southern Sonora to Guatemala. Many individuals remain in breeding habitat all year, especially in southern part of range, while others migrate geographically or altitudinally to winter in riparian vegetation. In Mexico, some winter in riparian vegetation in foothills and lowlands.

## Breeding habitat

Open pine woodland, typically with oak understory; in northern part of range this habitat is usually found at elevations from 6,800–9,800 feet (2,100–3,000 meters). Found in riparian vegetation surrounded by pine-oak woodland, but not where adjacent vegetation is open grassland or scrub.

## Conservation status

This species is of moderate conservation importance, primarily because of its limited overall range, low breeding density, and its association with mature pine forests. Populations are not well monitored, and precise habitat and area requirements of this species are poorly known.

## Description

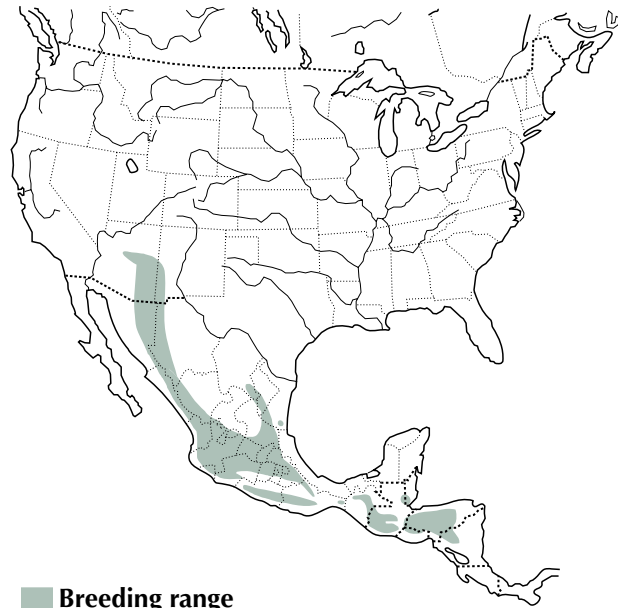
**Male:** Overall grayish-olive above, yellowish-white underneath, does not show as much contrast below as the similar Olive-sided Flycatcher. Also, tail is longer, bill thinner, and crest more pointed than Olive-sided Flycatcher. The slender crest is often visible, the broad, flat bill is two toned: upper mandible is dark, the lower is orange.

**Female:** Same as adult male.

**Juvenile:** Very similar to adults, but are plain gray underneath and may show two buffy wing bars.

## Vocalizations

**Songs:** Functional song, used in territorial defense and mate attraction, is a plaintive *Ho-say ma-ree-ah*. Most often heard in breeding habitat; only males reported singing.



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**Calls:** Difficult to distinguish from other members of the genus *Contopus*. Repeated *pip* or *peep*, *beep-beep* may be a contact call, heard during foraging with a mixed flock of warblers and nuthatches. Also gives a *quip-quip*.

## Foraging strategy

Sits erect, often on a tree-top perch, turning head from side to side watching for flying insects; sallies, or flies rapidly from perch to catch insect, then returns to same perch. Moves around large feeding area from one perch to another, which are often several hundred meters apart; flights are generally > 50 feet (16 meters). In hot weather feeds most actively in early morning and late afternoon.

## Diet

Only general information exists on diet, seems to mainly consist of flying invertebrates. In winter, a wider variety of invertebrates and berries.

## Behavior and displays

- Rarely seen on ground, but will land to gather nest material.
- Flies rapidly and maneuvers actively.
- A single Greater Pewee is often included in flocks largely composed of resident and wintering wood-warblers.

- If a second Greater Pewee tries to join the flock, a noisy confrontation occurs, lasting until the intruder or original flock member is expelled.

## *Courtship*

- No information on courtship displays, copulation, extra-pair copulations, or duration and maintenance of pair bond.

## *Nesting*

**Nest Site:** Nests trees are primarily mature pine and oak, will also use mature sycamore, spruce, and maple. Typically placed in the fork of a branch, and nests built on large limbs are typically placed closer to the tip of the branch than to the trunk.

**Height:** Average nest height about 35 feet (10.5 meters).

**Nest:** Composed mostly of grass, shredded bark, and pine needles with a few twigs, male pine cones, pe-

wee contour feathers, oak catkins, and insect material intermixed. Lichens and spider webs cover outside of nest, spider silk may attach nest to main branch and supporting side branches.

**Eggs:** 3–4 dull white or creamy white eggs are sparingly marked with brown towards the larger end.

**Incubation period:** No information.

**Nestling period:** Young are altricial at hatching, both adults appear to feed nestlings. No information on brooding, although only female reported to have a brood patch.

**Fledgling period:** Young are barely able to fly when they leave the nest, both adults tend to fledglings. Length of fledgling stage variable. After fledging, young and attending parents begin moving to lower elevations.

**Broods:** No information.

**Cowbird Parasitism:** No records of brood parasitism.

# BRIDLED TITMOUSE

## (*Baeolophus wollweberi*)

### Distribution

**Year-round range:** Only the northern tip of the range extends into the United States, southwestern New Mexico and southeastern Arizona, including the Mogollan Plateau. In Mexico, occurs in all mountain ranges that delimit the Mexican Plateau, south to Sierra Madre del Sur, west of Isthmus of Tehuantepec.

### Breeding habitat

Predominately oak or mixed oak-juniper woodlands, typically found at 5,250–7,200 feet (1,600–2,200 meters) in Chiricahau and Huachuca Mountains of southeast Arizona. Also found in riparian habitats dominated by Fremont cottonwood, Arizona sycamore, velvet ash, bigtooth maple, and desert willow. Resident in most riparian habitats, except sycamore forest patches of open foothills.

### Conservation status

This species is of moderate conservation importance, primarily because of its limited breeding range and its association with intact oak and riparian forests. Populations are poorly monitored, even within its U.S. range, and precise habitat and area requirements are poorly known.

### Description

**Male:** Grayish-brown above, including crown, neck, back and wings. Whitish to light gray below with contrasting black throat. Pronounced crest and bridled face pattern are distinctive: the face is white with a black eye line extending from the bill to the cheek, where it is met by a black line extending from the throat.

**Female:** Same as adult male.

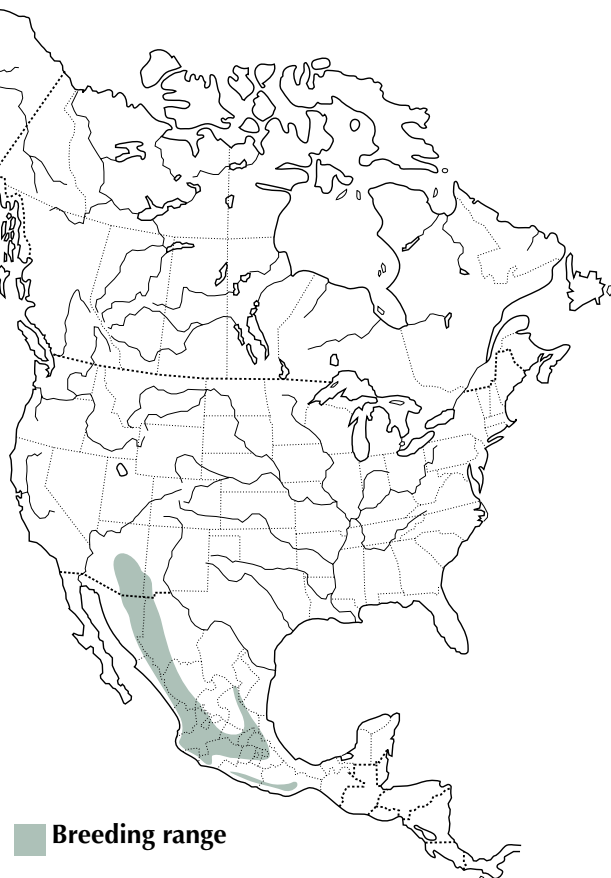
**Juvenile:** Same as adults.

### Vocalizations

**Songs:** The total repertoire has not yet been delineated, but individuals have 3 song types.

**Type 1 song:** Used most frequently in distant exchanges with territorial neighbors or intruding males, a series of identical notes.

**Type 2 song:** Consists of a variable number of repetitions of doublets of one note type and is used most frequently in spontaneous advertising, *peeta-peeta*.



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**Type 3 song:** Used in close exchanges between males, also as males approach nest during laying or incubation, and is also given by males approaching nest with food. Type 3 is similar to Type 2, but differs by lacking doublets.

**Calls:** Several calls known, the “chick-a-dee” is the most commonly given call.

A “dawn serenade” is a mixture of vocalizations given by the male near nest just before and during egg laying; the female responds by leaving nest cavity and brief chases and copulation follow.

Alarm “zee”s are very high-pitched, low-amplitude series of notes similar to those of other Parids.

“Sexual calls” are a rapid series of notes given by the female while wing-quivering, usually when male is within 3 feet (1 meter). May precede copulation.

“Begging calls” and “agonistic calls” are also known.

### Foraging strategy

Forages in every tree species, especially oaks, commonly between 10–20 feet (3–6 meters) high; ground



foraging is rare, but hops on ground when prey drops from trees or searching for acorns or galls. Typically gleans foliage and forages in bark, hovers while taking prey that has flushed.

## **Diet**

Adult and larval insects. Feeds on acorns, especially during winter, eating acorn pulp and also searching for larvae of snout beetles growing inside acorns; searches for larvae inside oak galls.

## **Behavior and displays**

- Hops when moving from twig to twig, or when going up branches of a tree.
- Bathes regularly in ponds, including those formed by rain in rock crevices.
- Sunbathes by perching on a trunk or branch and stretching a wing over body, leaning with one side of head facing sky, eye partly closed; eventually exposes the other side of body and head.
- Chasing occurs during territorial encounters.
- In territorial encounters, males display to each other with head raised, enhancing conspicuousness of facial pattern and black bib. Also raise and spread out crest, slightly drop and quiver wings, move head slightly and slowly from side to side.
- Crest is flattened in fearful situations, erect and spread during mobbing and territorial interactions, more relaxed in other situations.

## **Courtship**

- Male feeds female regularly during cavity inspection and selection of nest material. Female elicits feeding when near mate by calling like young

bird begging for food, body crouched and wings quivering, crest slightly raised, showing contrasting facial pattern.

- Female initiates copulation by quivering wings and giving a special, low amplitude call consisting of several repetitions of the same note.

## **Nesting**

**Nest Site:** Nests in cavities, generally natural ones such as knothole or other spot partly decayed, also uses artificial nest boxes. Female searches for nest site, followed closely by her mate. Commonly nests in sycamore, cottonwoods, and oaks.

**Height:** Ranges between 2–32 feet (0.5–10 meters).

**Nest:** Does not excavate a nest, but will clean cavity by removing small pieces of wood. Constructs a cup nest using various materials, including cottonwood down, dried grass leaves, cotton, downy covering of leaf buds, flowers, catkins, lichens, rabbit fur, and cocoons of spiders and insects.

**Eggs:** 5–7 white and immaculate eggs.

**Incubation period:** Little known, but estimated 13–14 days (this is length of time that the female remains longer in nest to time adults begin feeding trips).

**Nestling period:** Hatchlings are naked with eyes closed. Males may develop a partial brood patch and help with brooding. Both sexes tend to young, helpers also feed nestlings.

**Fledgling period:** Little data on fledgling period. Age at fledging unknown, but estimated at 18–20 days. Both parents and helpers actively feed fledglings; helpers also participate in mobbing. Young are able to fly at 25–27 days.

**Broods:** Single brooded.

**Cowbird Parasitism:** Not known to occur.

# GRACE'S WARBLER

## (*Dendroica graciae*)

### Distribution

**Breeding:** Scattered populations in the mountains from southern Nevada, southern Utah, and southwestern Colorado, south through western and central Mexico to Nicaragua.

**Winter:** The highlands of western Mexico, south to Nicaragua.

### Breeding habitat

Breeds almost exclusively in open forest of tall pines, generally from 6,550–9,850 feet (2,000–3,000 meters). Ponderosa pines are occupied in most of the U.S. range except along the Mexican border, where Apache and Chihuahua pines are also used. Breeding habitat may include a mixture of oaks, junipers, and firs, but pines are almost always an important element. At a few breeding sites near the edge of the species' range, white firs rather than pines are occupied.

### Conservation status

This species is of moderate conservation importance, because of its relatively small and patchy distribution, and its restriction to mature coniferous forests. Populations are not well monitored in any part of its range, and habitat requirements are poorly known.

### Description

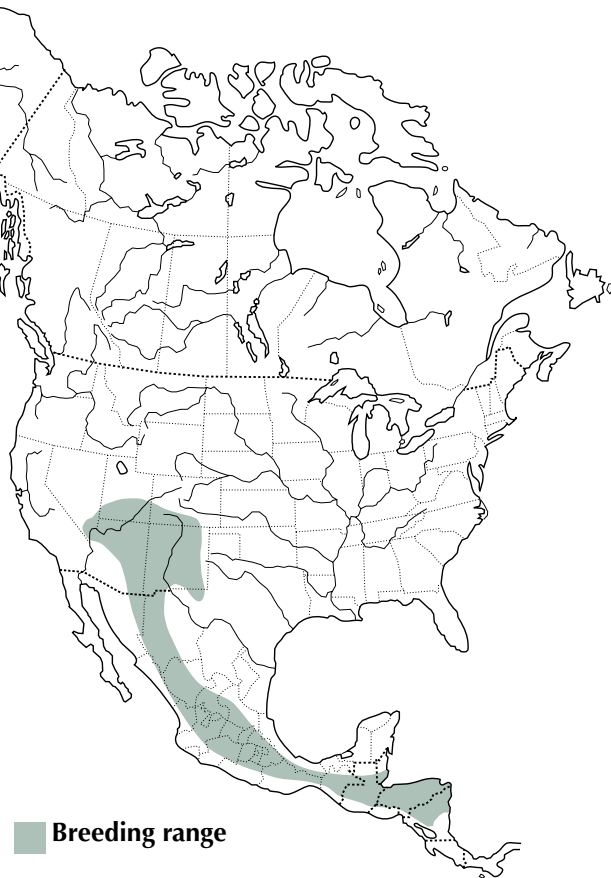
**Male:** One of the smallest *Dendroica* warblers, moderately long tail, fine bill. Gray above, black streaks on back and crown. Throat, upper breast yellow; remaining underparts white with dark streaks on sides. The yellow eyebrow turns white behind eye. Wings and tail are dark, with 2 white wing bars and white outer tail feathers.

**Female:** Similar to adult male, but upperparts are duller gray, black streaks on flanks are finer.

**Juvenile:** Resembles adults, except lacks yellow on throat and breast, underparts buffy white with breast lightly spotted and streaked.

### Vocalizations

**Songs:** A slightly rising and accelerating series of *chee* notes, perhaps too slow to be considered a trill, lasting about 2 seconds. The song consists of two (occasionally three) slightly differing phrases, *chew chew chew chew chew chew chee chee chee*. Each male has several



variations of this song, singing these song variants in different combinations in different contexts.

**Calls:** A soft slurred *chip*; the flight note is a very high, thin *sip*.

### Foraging strategy

Most commonly forages in the very upper canopies of the tree, gleaning food from leaves and branches of pines, hemlocks, and spruces. Occasionally catches flying insects on the wing.

### Diet

Poorly known, presumably largely or entirely insects.

### Behavior and displays

- Because this small bird lives high up in pine trees and is difficult to observe, little is known of its life history.
- It moves from treetop to treetop with a quick erratic flight, darting out of the canopy to catch prey in midair.

## ***Courtship***

- No information.

## ***Nesting***

**Nest Site:** High limbs of pine trees, usually well out on a branch or in the crown. Often hidden from view, as nest is usually concealed in foliage or in the middle of bunches of pine needles.

**Height:** Usually high, ranging from 18–65 feet (6–20 meters).

**Nest:** A compact cup of hair, vegetable fibers, plant down, catkins, and bud-scales, wool, and caterpillar webs, often lined with feathers and hair. Probably built by female alone.

**Eggs:** 3–4 white to creamy eggs are marked with browns, usually wreathed.

**Incubation period:** No information.

**Nestling period:** Little information. Young are altricial, down grayish, mouth pink; tended by both parents.

**Fledgling period:** No information.

**Broods:** Double brooded.

**Cowbird Parasitism:** No information.

# RED-FACED WARBLER

## (*Cardellina rubrifrons*)

### Distribution

**Breeding:** Breeds at high elevations from central Arizona east to western New Mexico through the Pacific slope and adjacent interior of Mexico from Sonora to Durango. Casual in southern California, where it may breed, and central and southeastern New Mexico; also sight reports from southern Nevada and Texas.

**Winter:** Winters in the highlands of Mexico from Sinaloa and Durango south to Guatemala, El Salvador, and Honduras.

### Breeding habitat

Breeds at high elevation, generally from 6,550–9,200 feet (2,000–2,800 meters), in montane fir, pine, and open pine-oak forests. Also in more mesic sites such as stream and snowmelt drainages that include conifers such as Douglas fir, spruce, and/or deciduous vegetation such as quaking aspen and canyon maple mixed with conifers. On the Mogollon Rim, n. Arizona, this species is particularly abundant in steep canyons but also occurs in flatter terrain.

### Conservation status

This warbler is of high conservation importance, because of its very restricted and patchy breeding distribution and its dependence on montane coniferous forests. Populations are not well monitored, and precise habitat or area requirements are poorly known.

### Description

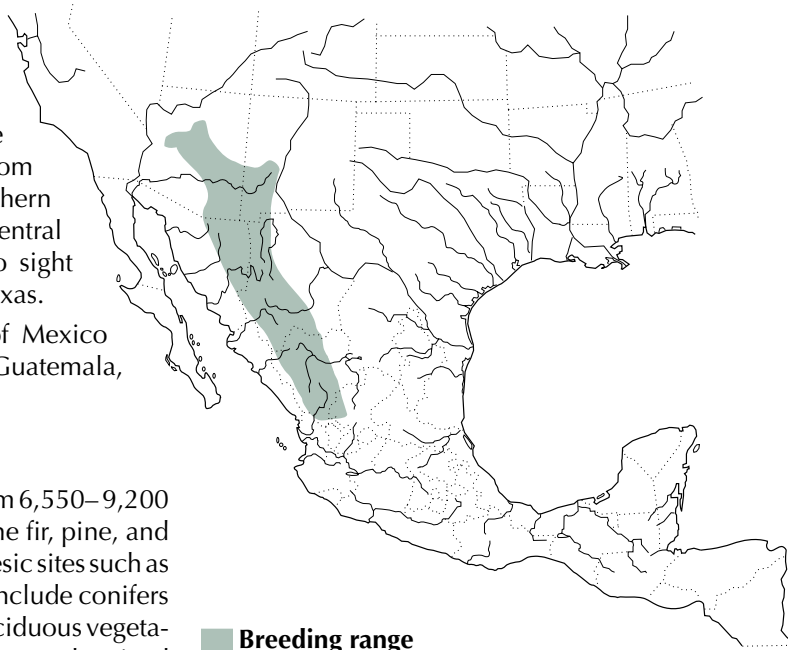
**Male:** The brilliant red on the forehead, throat, and sides of neck give this species its colorful name. Black on the crown and sides of the face, gray on the back, white underneath. White patches on the nape and the rump are sometimes seen.

**Female:** Similar to adult male, but red is slightly paler.

**Juvenile:** Gray-brown above with a whitish rump and two buffy wing bars. Head and breast are brown, the belly is gray.

### Vocalizations

**Songs:** A clear and energetic series of thin, variable notes ending with one or more downward slurred notes, *wi tsi-wi tsi-wi si-wi-si-whichu*. The number and arrangement of notes are highly variable. A flight song has also been noted.



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**Calls:** A sharp *chup* or *tchip*. Adult pair members “chip” to maintain contact with each other during all stages of nesting; adults also seem to use the same call to maintain contact with both nestlings and fledglings. Adults give a harsh call to scold predators, especially when near the nest or young.

### Foraging strategy

Birds glean on outer branches of trees; sally for aerial prey, spiraling downward in pursuit of flying insects; occasionally hovers to glean insects from foliage.

### Diet

Insectivorous, taking caterpillars, flies, and bees during the breeding season.

### Behavior and displays

- Hops on ground when examining possible nest sites and while picking up nesting material.
- The male establishes, defends, and advertises an all-purpose territory, within which both male and female feed. Male chases conspecifics while establishing territory and, much less often, when at the boundaries of territory. Once territory is established, male seems to spend more time chasing and displacing intruders than disputing territory boundaries or ownership. The female defends the territory against other females.

- Socially monogamous with 1 pair/territory, but neighboring males often sneak onto territories to solicit extra-pair copulations. Male closely guards mate before and during nest-building. Unlike in most other species in which mate-guarding has been described, guarding continues after egg laying into the incubation period.
- Copulation attempts can be initiated by either sex and seem to change with stage of breeding. While a female is prospecting for nest sites, male solicits copulations on the ground where the female is searching. A male quivers his wings in a typical begging response with head up and tail spread as he circles the female. During nest building, both pair members solicit copulations.

## *Courtship*

- No information.

## *Nesting*

**Nest Site:** Nest is a small depression on the ground, either scraped out or naturally occurring, on a slope in the open, or at the base of woody plants. Sometimes a roof, provided by a woody plant stem, log, dirt and forbs, grass, or rock, conceals the nest. The female chooses the site, often accompanied and guarded by male as she prospects.

**Height:** Nest placed on ground.

**Nest:** The outer layer of the cup-shaped nest is constructed from pieces of bark, particularly aspen, also dead maple leaves or pine needles. Inner layers are made of grass; bowl is often lined with animal hair.

**Eggs:** 4–5, rarely 6, occasionally 3 late in season. The eggs are white and finely speckled with brown or chestnut, often with a wreath of thicker speckling and blotches near the larger end

**Incubation period:** Only the female incubates, sitting tightly on the nest and flushing only when danger is near the nest. She then performs distraction displays, such as wing fluttering on ground, as she leaves.

**Nestling period:** Young are altricial, with closed eyes and naked except for gray down on capital tracts. Both parents feed young starting at hatching day. Young open eyes at day 4, feathers begin breaking the sheath at day 6.

**Fledgling period:** Young leave the nest at day 12. Upon departure young can fly only 30–50 feet (10–15 meters) as the tail is about half-grown and wings only three-quarters developed. From a nearby bush, the parents wait with food and watch as nestlings fledge, feeding each after departure. Young separate immediately upon fledging and do not associate for the first few weeks. The young beg from and are fed by parents, although they begin foraging for themselves after a few days.

**Broods:** No information.

**Cowbird Parasitism:** Rare Brown-headed Cowbird host.



# SCOTT'S ORIOLE

## (*Icterus parisorum*)

### Distribution

**Breeding:** The Sonoran Desert, from southern California, Nevada, Utah, western Colorado, central New Mexico and west Texas; south into Mexico, where it is present year-round in the central and southern regions.

**Winter:** Mexico.

### Breeding habitat

Desert grassland prairies and mountain canyons, particularly if yucca or palms are present. Pinyon-juniper woodlands, sycamores, and cottonwoods are frequently used as nesting trees. They always live within range of a reliable water source, but are not normally found in humid, forested mountains and the high plains areas. They are most common on and near the desert foothills and mountains of southern and southwestern New Mexico.

### Conservation status

Although a locally common breeder in proper habitat, the Scott's Oriole is showing a steady populations decline across its small U.S. breeding range. It is listed as a priority species by Arizona Partners in Flight. This oriole's precise breeding requirements and sensitivity to disturbance are poorly known, and further study will be important for maintaining healthy populations and reversing declines.

### Description

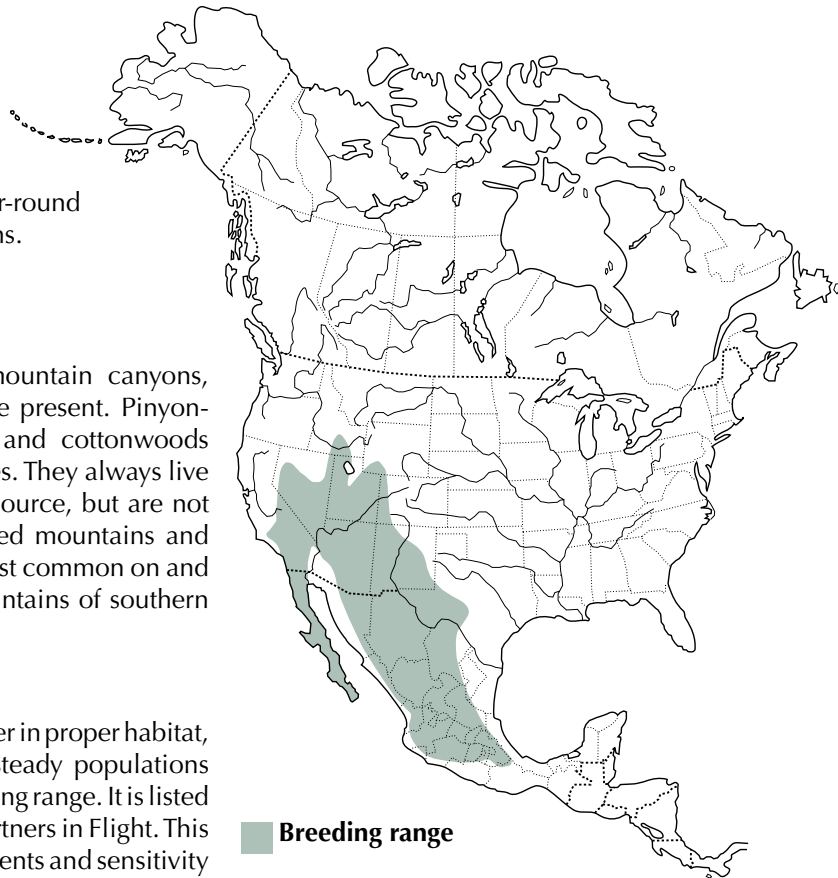
**Male:** A black hood covers the head, face, mantle, throat, and central breast; lower breast, belly, and undertail are bright lemon-yellow, as is the rump and a patch on the upper wing. Wings, the central tail feathers, and a wide band at the tip of the tail are also black, 1 slender white wing bar.

**Female:** Upperparts are olive with dark streaks on back, underparts are dull greenish-yellow with a variable amount of black on the throat. Wings show two white wing bars.

**Juvenile:** Head and upperparts are grayish, some dusky streaking on back; underparts are drab grayish-yellow, brightest on belly.

### Vocalizations

**Songs:** Low, clear whistles with slightly gurgling quality, reminiscent of Western Meadowlark but pitch remains level or rises slightly.



©Cornell Lab of Ornithology

**Calls:** A harsh, relatively low-pitched *cherk*, *jug*, or *shack*. "Flight call" is a husky, low *zhet*.

### Foraging strategy

Frequently observed climbing in drooping branches and twigs, and along delicate yucca flowers. Probes flowers for nectar and gleans the small insects the flower attracts; gleans available fruit.

### Diet

Mainly insects, including grasshoppers, small beetles, caterpillars, butterflies and insect larvae, berries and cactus fruit; also flower nectar.

### Behavior and displays

- Perches and roosts in trees, also in tall shrubs.
- It rarely comes out of wooded areas, unless to defend its territory from a would-be intruder.

### Courtship

- No information.

## *Nesting*

**Nest Site:** Will use the branches of almost any available shrub or tree, suspending the nest from the branch base. Often found in the dead portion of a yucca underneath the live crown, laced to the dead blades. The color of these dried leaves acts as camouflage, the leaves provide protection from bad weather and potential predators.

**Height:** Ranges from 3–25 feet (1–7.5 meters).

**Nest:** Female constructs a pendant nest woven through overhanging leaves or suspended from twigs. Nest materials include yucca and palm fibers, fine grass; cup is lined with fine grass, cotton waste, hair.

**Eggs:** 2–5, usually 3–4 pale bluish-white eggs blotched, streaked, and spotted with brown, black, purple, and gray.

**Incubation period:** 12–14 days, solely by female.

**Nestling period:** Both parents tend to the young.

**Fledgling period:** Young leave nest at 14 days.

**Broods:** Double brooded.

**Cowbird Parasitism:** Rare host of Bronzed Cowbird.

# NUTTALL'S WOODPECKER

## (*Picoides nuttallii*)

### Distribution

**Year-round range:** West of the southern Cascade Mountains and in the Sierra Nevada from southern Oregon to northern Baja California, Mexico.

### Breeding habitat

Occurs in oak woodlands, live oak forests, and chaparral, and in canyons with sycamores, alders, cottonwoods, and bay trees growing along streams lined with live oaks. Requires snags and dead limbs for nest excavation. Frequents a mix of deciduous riparian and adjacent oak habitats.

### Conservation status

This woodpecker is of moderate conservation importance, primarily because of its limited range, low overall density, and its association with intact oak and riparian forests. As a primary cavity nester, this species provides nest sites for many other species in these forests. Populations appear to be stable at present, and this species is common and somewhat tolerant of human activity.

### Description

**Male:** Very similar to the Ladder-backed Woodpecker. Back and wings are barred black-and-white; outer tail spotted (rather than barred); undersides are white with spotted flanks. The red on the Nuttall's head extends only to mid-crown (red extends to the forehead on the Ladder-backed). Nuttall's show more black on the face and thicker black bars on the back and outer tail feathers than do Ladder-backed Woodpeckers.

**Female:** Same as adult male, except no red on crown.

**Juvenile:** Same as adults, except coloring on head is interspersed with white.

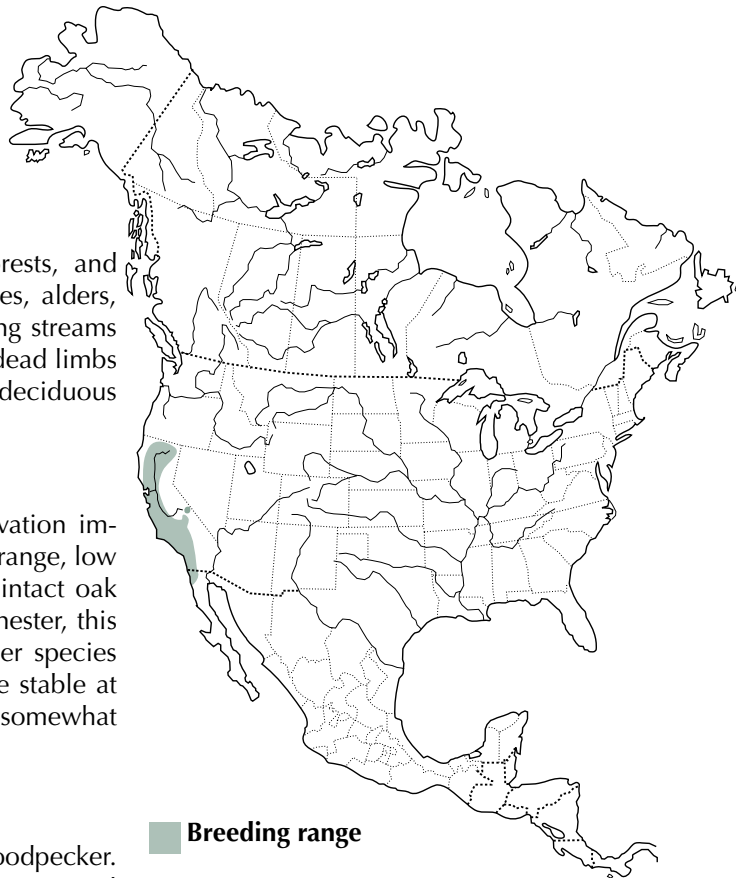
### Vocalizations

#### Calls:

**Drum:** Steady, medium speed, relatively long; noticeably longer and faster than Downy Woodpecker.

**Contact call:** Sharp, rising, two- or three- note *pitik*, occasionally a single-note *pik*; quality much like the Hairy Woodpecker.

**Rattle call:** Level and steady *pitikikik*.



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### Foraging strategy

Forages on the trunks and branches of oaks and other trees, creeping diagonally as they search in crevices and underneath bark; often hang upside down under limbs as they probe for insect prey. Males tend to work on the trunk and larger branches, whereas females use smaller branches. Pecks, probes, drills for sap, and gleans from trunks, branches, twigs and foliage; occasionally flycatches.

### Diet

Primarily insects, such as beetles, caterpillars, ants, and bugs; also fruits, berries, poison oak seeds, nuts, and sap. Although Nuttall's Woodpeckers forage preferentially in oaks, acorns make up only a small part of their diet.

### Behavior and displays

- Defends immediate area around nest, especially from Ladder-backed and Downy woodpeckers.

- A small and retiring woodpecker, Nuttall's is often hidden in foliage and may be heard before it is seen.

## *Courtship*

- No information

## *Nesting*

**Nest Site:** Excavates cavities in dead limbs and trunks of oak, willow, sycamore, cottonwood, elder, and alder trees located in riparian habitats. Requires snags and dead limbs for nest excavation.

**Height:** Ranges 3–65 feet (1–20 meters) above the ground.

**Nest:** Entrance hole 1.5 inches (4 cm) in diameter; cavity 7–10 inches (18–25 cm) deep, excavated mainly by male.

**Eggs:** 3–6, usually 4–5, white eggs are laid between late March and mid-June.

**Incubation period:** For 14 days the sexes alternate incubation during the day, males incubate at night.

**Nestling period:** Little information; young are tended by both parents.

**Fledgling period:** At 29 days the young leave the nest; young are able to fly at fledging.

**Broods:** Single brooded.

**Cowbird Parasitism:** No information.

# OAK TITMOUSE

## (*Baeolophus inornatus*)

### Distribution

**Year-round range:** From southwest Oregon through California to northwestern Baja California, Mexico.

### Breeding habitat

Low- to mid- elevation habitats, closely tied to warm, dry oak or oak-pine woodlands. Composition of oak woodland varies, but arboreal species dominate, and woodland is generally open. May use scrub oaks or other brush as long as woodland occurs nearby. Despite clear preference for oaks, populations in some areas have adapted locally to warm, dry environments without oaks, e.g. western juniper woodland in extreme northern California.

### Conservation status

This species is of moderate conservation importance, primarily because of its limited range and its association with intact oak and riparian forests. The overall population is exhibiting a significant long-term decline. Understanding precise habitat requirements and sensitivity to various land-use practices will be important for conserving future populations.

### Description

**Male:** Generally described as “plain” and “drab”: brown-tinged overall, short crest, plain face. In some parts of range, birds are grayer and paler.

**Female:** Same as adult male.

**Juvenile:** Same as adults.

### Vocalizations

**Songs:** Strong, whistled, repeated phrases *tjiboo*, or paired *tuwituwi*, and other variations. Also a rapid, popping trill.

**Calls:** Call high, thin notes followed by a single harsh scold *si si si chrr*; the same pattern often given in clear, whistled Notes *pi pi pi peeew*.

### Foraging strategy

Primarily seen in trees at varying heights hanging from twigs and corrugations in bark to search undersides of limbs for insects. Captures insects by gleaning bark and, to lesser extent, foliage. Uses bill to expose arthropods by pecking and probing into crevices, chipping away bark, and pulling apart leaf galls, flowers, curled dead leaves, and lichens. Occasionally uses aerial foraging maneuvers (e.g., hovering, chasing) to attack flying insects. Large insects are carried held



■ Breeding range

with foot and pulled into smaller portions using the bill; large seeds are hammered into smaller portions while they are held in the same manner.

### Diet

Seeds, including oaks, pines, oats, thistles, weeds, and poison oak; and terrestrial invertebrates, including leafhoppers, treehoppers, jumping plant lice, aphids and scales, homopterans, caterpillars beetles, ants and wasps. Common visitor to bird feeders in wooded areas.

### Behavior and displays

- Actively moves from branch to branch and tree to tree.
- Prefer to stay close to trees, flying between trees in shallow undulating motion. Flight from ground to elevated perches is more direct.
- Agonistic interactions with territorial intruders generally are accompanied by exchange of song (including counter-singing), harsh scolding notes,



quivering of wingsh, and threatening posture with crest raised.

- Territories are defended by both members of a pair and used for foraging, nesting, roosting, and all other activities year-round.

## ***Courtship***

- Immature birds typically form pair bonds after of family groups breakup in summer; most birds are paired by early to mid fall.
- Pair bonds are permanent, unless one member of pair disappears.

## ***Nesting***

**Nest Site:** Female largely responsible for selecting site, which is primarily a natural tree hole or wood-pecker-excavated cavity in main branches, secondary branches, or trunks; also use natural holes in stumps. May partially excavate own nest in soft or rotten wood, or may alter or further excavate existing cavity. Readily uses nest boxes and other artificial sites.

**Height:** Average about 12 feet (4 meters).

**Nest:** A cavity is usually altered or further excavated by both birds. A cup of hair, fur, and feathers placed on a base of grasses, bark strips, moss, and earth; built mainly, or entirely, by female.

**Eggs:** 6–8 white, usually unmarked eggs are sometimes speckled with very pale reddish-brown. Eggs are smooth, non-glossy, or only slightly glossy.

**Incubation period:** 14–16 days by female alone; male feeds the female as she incubates.

**Nestling period:** Young tended by both parents, both parents feed nestlings, but only female broods. On average, young fledge at 17 days.

**Fledgling period:** Young leave nest when capable of climbing to cavity entrance, between 16–21 days; they do not fly out of the nest, although they are presumably capable of flying short distances. Parents lead fledglings to foliage, which is used for cover and roosting. Young remain with parents for 3–4 weeks.

**Broods:** Single brooded.

**Cowbird Parasitism:** Not known to occur.

## ***Notes***

- Adequate roosting cover is an important habitat requisite for Oak Titmouse. Roost sites include natural or artificial cavities, as well as dense evergreen foliage.

# BROOD PARASITES

## ***Why are we interested in Cowbirds?***

Researchers believe that parasitism by cowbirds may be a significant factor contributing to the declining numbers of many songbirds in North America. This is especially problematic in areas of the United States where large tracts of forest are being fragmented for development and timber harvest. This creates forest “edge”—areas where open fields or lawns meet dense woodland. Nest parasites such as cowbirds thrive in such areas, where they have easy access to other bird’s nests.

Cowbirds were historically open-country birds, associating with buffalo herds and later adapting to domestic cattle. The prairies and plains were the cowbirds’ homeland, but they have now expanded their ranges. Currently the Brown-headed Cowbird’s range includes all of the 48 contiguous states and southern Canada, while the Bronzed Cowbird expanded its range out of Mexico and is resident in much of the southwestern U.S.

Historically, Brown-headed Cowbirds laid their eggs in the nests of grassland species. Because these species evolved side-by-side with cowbirds, many of them developed defenses against cowbird parasitism—some can recognize cowbird eggs and eject them from their nests. Most forest-nesting birds, however, have had no long-term exposure to cowbirds. Once a cowbird lays its eggs in the nest of a thrush or other woodland species, the host birds often raise cowbird young rather than their own offspring. Of 220 species known to have been parasitized by Brown-headed Cowbirds, and 144 have raised young Brown-headed Cowbirds successfully. Bronzed Cowbirds, which have a much more limited range in the U.S., are known to parasitize 82 species, and 32 have successfully raised Bronzed Cowbird young. BFL participants can help us learn more about how cowbirds interact with forest-nesting birds.

## ***Territorial behavior and courtship***

The type of territorial behavior used by a Brown-headed Cowbird depends on the type of habitat in which it lives, as well as on the sex ratio of males and female in the local cowbird population. In the open farmlands of the Midwest, where host species are less numerous and more concentrated at field edges, Brown-headed Cowbirds do not seem to be territorial. Instead, small flocks of males remain in fixed areas while female home ranges are rather large. A common sight in one of these flocks is the males, either perched or on the ground, displaying to each other. Through these displays, males are competing for dominance in that area. As females roam widely in search of suitable nests in which to lay their eggs, they will mate with the dominant male in each area. Thus, each female may mate with a number of males, resulting in promiscuous matings. In some areas, the home ranges of females are thought to overlap, because eggs of more than one female are frequently found in a single host’s nest. A single cowbird will generally lay only one egg per nest.

In mixed deciduous woodlands where host species are numerous and widely dispersed, cowbirds are thought to be territorial and monogamous. The females return in early spring and form territories from 10–50 acres (4–20 hectares). Males compete with each other for dominance in a female’s territory, and the dominant male then “guards” the female by following her wherever she goes in her territory. When other males come near, he gets between the intruder and his mate and displays, which usually makes the other male leave. The dominant male guards the female because she will mate with whatever male she is near. Female cowbirds will keep other females out of their territories at least during the morning hours, which is when egg laying is accomplished. Later in the day, all cowbirds in a given area feed together at certain prime feeding spots, whether these exist in a bird’s territory or not. Males may continue guarding a mate from other males, but they do not defend a territory. Courtship behavior continues through the egg-laying phase, which stops about mid-summer. Though the Bronzed Cowbird has not been studied as thoroughly as the Brown-headed Cowbird, it is presumed the Bronzed Cowbird’s behaviors and physiology are similar to the congeneric Brown-headed Cowbird.



# BROWN-HEADED COWBIRD

## (*Molothrus ater*)

### Distribution

**Breeding:** Occupies most of our continent south of the Arctic. Range has expanded east and west from Great Plains with clearing of forests and introduction of cattle, with which it now associates.

**Winter:** Winters throughout much of U.S. and south to southern Mexico.

Highly gregarious at all seasons; postbreeding flocks in the fall generally number 50–200. Feeds and roosts in enormous flocks with other blackbirds and starlings, especially in winter.

### Breeding habitat

Woodland, forest (especially deciduous), forest edge, grassland, farmlands, suburban gardens, shade trees.

### Description

The smallest of our blackbirds (6–8 inches or 15–20 centimeters); with a stubby, conical bill and relatively short tail. Dark eye in all plumages. Western birds are slightly smaller than eastern birds.

**Male:** Brown head contrasting with glossy black-green body.

**Female:** Uniformly drab gray-brown.

**Juvenile:** Same size as adult cowbird; paler than adult female and more heavily streaked below; pale feather edgings give a scaled appearance to the back.

### Vocalizations

**Song:** Male's song is a squeaky gurgling, usually ending with a few high, squeaky whistles. The female's chatter is often given in unison with the male's song during courtship.

**Calls:** Calls include a harsh rattle or chatter, usually given by the female, a short *chuck* note given by both sexes when alarmed, and squeaky whistles given by the male, especially in flight. The loud begging calls of fledgling cowbirds are distinctive.

### Behaviors and displays

#### Male

If you observe any of the following displays, mark "males displaying" in the "Cowbird" section of the Field Form.



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**Bill-tilt:** Bird lifts head and points bill skyward. Feathers may be sleeked. **Context:** Given when competing for dominance with another bird. Sometimes followed by topple-over display.

**Topple-over:** This display has been described by writers as everything from gallant bowing to motions suggestive of extreme nausea. The bird fluffs body feathers, arches neck, spreads tail and wings, and seems to fall on his face. Display often ends with a brief bill-wiping. Song often accompanies display. **Context:** Given on perches or on the ground. Given by males to females or to other males; may function as courtship to females and as a competitive display to other males.

**Head-forward:** Bird fluffs body feathers, raises wings, and thrusts head forward. **Context:** This display occurs during territory defense and during feeding when many birds are present. May be given toward other species as well.

#### Female

Female Brown-headed Cowbirds perform some of the same displays as males of the species. Females tend to

be “sneaky” when searching for host nests, skulking quietly through the undergrowth or canopy leaves. A female Brown-headed Cowbird often locates a potential host nest during its construction phase. She then regularly visits the nest prior to laying while the host species are absent. The female cowbird lays eggs at dawn; she removes (and occasionally eats) an egg of the host the day before or the day after the parasitic egg is laid. If only one host egg is present, she does not remove it (otherwise the host might abandon its now eggless nest).

Bill-tilt: Performed when competing for dominance with another female cowbird.

Head-forward: May occur during territory defense.

## ***Nesting***

**Height:** Brown-headed Cowbirds are known to lay their eggs in the nests of treetop species as well as ground nesters.

**Eggs:** White to grayish-white, evenly marked with browns, often heavier markings at large end. Host may desert nest, build floor over cowbird egg, throw the egg out, or accept it. Approximately one-third of all parasitized nests hold more than one cowbird egg.

A female cowbird has a long reproductive period with an extraordinarily short interval between clutches. In fact, the Brown-headed Cowbird is the only wild passerine ever reported not to show regression of ovaries and oviducts following clutch completion. Indeed, the physiological demarcation between clutches sometimes is not at all clear, leading ornithologists to characterize female cowbirds as “passerine chickens.” Each female’s laying cycle appears adapted to take advantage of a continuous supply of host nests for about a two-month periods. An average female

lays about 80 eggs, 40 per year for two years. About 3% of those 80 eggs reach maturity—an average of 2.4 adults per female. Clearly, such numbers more than compensate for the excessive loss of eggs and young in the nests of inappropriate hosts. Each pair of cowbirds replaces itself with an average of 1.2 pairs—which will double a cowbird population in eight years.

**Incubation period:** By host; 10–13 days

**Nestling period:** 10–11 days.

A major adaptation for parasitism seen in nestling and fledgling cowbirds is their rapid development. Cowbird eggs usually hatch one day ahead of the host’s eggs. In addition, cowbird nestlings usually are larger and grow faster than the host’s young, which enable them to garner more than their fair share of the food brought to the nest. Cowbird fledglings do not recognize their foster parents as individuals, but respond positively to all adults of their foster parent species. Fledglings receive more food than would the equivalent weight of host young, probably because their loud and persistent calling causes them to be fed more often.

Even though 97% of Brown-headed Cowbird eggs and nestlings fail to reach adulthood, cowbird parasitism reduces production of young by the parasitized species. Abandonment of a nest by a parasitized host may preclude renesting and result in zero production for that pair during that breeding season. The reproductive success of birds that suffer the presence of a cowbird chick in their nest will therefore be significantly lower than that of unparasitized conspecifics in the same population.



# BRONZED COWBIRD

## (*Molothrus aeneus*)

### Distribution

**Year-round range:** Extreme southeastern California, southern Arizona, New Mexico, and Texas, and locally in southern Louisiana, extending south through central Mexico to Panama. The eastern and western are two distinct populations which overlap in western Texas.

### Breeding Habitat

Open country with occasional tree patches or large tall shrubs, such as in riparian woodlands. Often found in humid, hot climates, commonly in areas of human habitation as well as where cattle are grazed. In Mexico, often found in tropical evergreen forest, tropical deciduous forest and tropical and subtropical scrub.

### Description

**Male:** Similar in shape to Brown-headed Cowbirds, but stockier, shorter tailed, and shows a thick ruff; also is smaller and shorter-tailed than blackbirds and grackles and has a more conical bill. Plumage is black and iridescent with glossy blue wings; the red iris and unique ruff on neck are distinctive.

**Female:** Birds in the eastern part of the range are similar to adult male, but duller and lack the glossy blue wings. Western birds are pale gray-brown, similar to female Brown-headed Cowbirds, but still with a red eye.

**Juvenile:** Pale gray-brown plumage that is darker on the upperparts, similar to the female Brown-headed Cowbird. Note the juvenile's dull-brown eye color as compared to the adult's distinctive red eye.

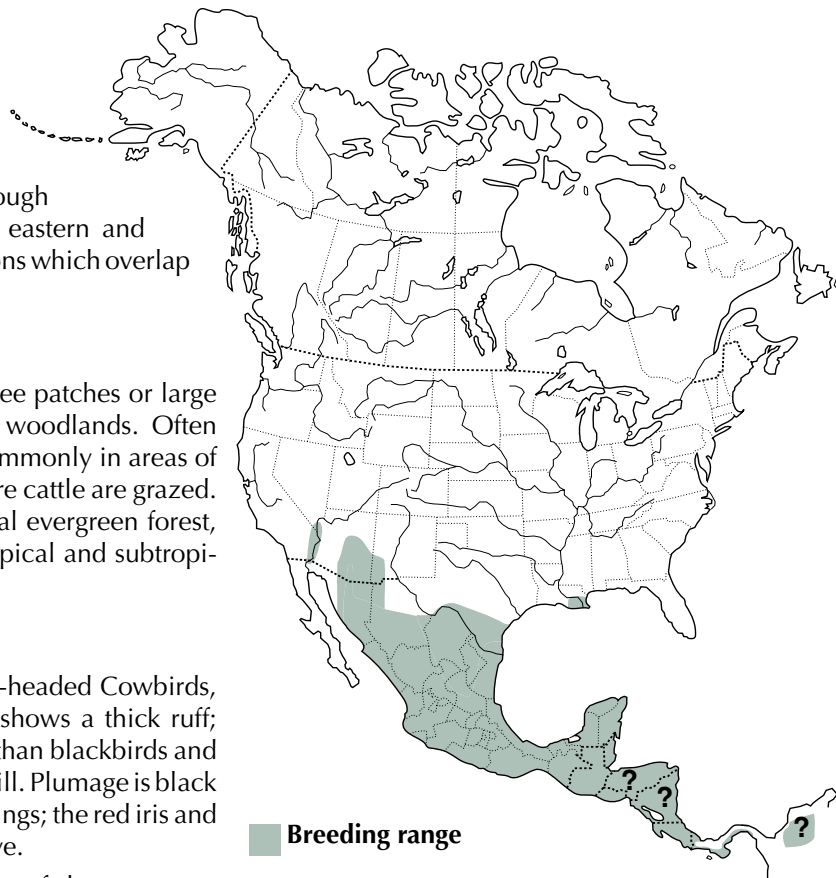
### Vocalizations

**Songs:** A soft, tinny, rising series of wheezy and guttural notes with various squeaks and squeals.

**Calls:** "Whistle call" is a series of tinny, wheezy whistles and grating trills given by the male. Throughout the range there are three distinct dialects, possibly a fourth in western Arizona, with distinctive introductory notes.

### Foraging Strategy

Walks on the ground, frequently in association in cattle. Along with gleaning insects from their skin, captures insects stirred up by the animals. Bronzed



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Cowbirds commonly feed and roost in large flocks and are frequent visitors to bird feeders.

### Diet

Insects from the ground, grain, and weed, grass, and grain seeds.

### Behavior and Displays

**Bill-tilt:** Used by males, rarely females, to defend area or to displace an individual. It is usually directed toward the same sex. A bird points bill upward when in close proximity of another bird, sometimes performed during a full run toward the recipient.

**Head-down:** One bird approaches another and assumes a head-down posture, raising the feathers on the nape of its neck; similar to the display of the Brown-headed Cowbird.

### Courtship

**Bow display:** Directed towards female by male. He first lifts the feathers on the back of the neck, followed by those of the upperparts, and finally those

of the underparts. The tail is brought forward and under the body while the wings are arched slightly and head is bent.

Hover display: The aerial version of the Bow display. Male flutters over female up to a meter high, returning to the ground to perform Bow display, or to repeat Hover display.

## ***Nesting***

Lays eggs in nests of other birds, eighty-two host species have been confirmed. Thirty-two of these species have actually reared Bronzed Cowbird young. Typical host birds nest in brushy habitats in semi-open to open ranch and farm areas as well as in residential areas. More than one female may leave eggs in a host's nest; laying females frequently pierce eggs already in the host's nest.

**Height:** Dependent upon the host species. Bronzed Cowbirds typically select birds that nest in brush, particularly orioles, tanagers, flycatchers, buntings, grosbeaks, and, more rarely, thrashers and thrushes.

**Eggs:** 1–3 unmarked light-bluish to greenish eggs are laid in a nest, usually early in the morning.

**Incubation Period:** 10–12 days.

**Nestling Period:** 11 days.

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