Gray Treefrog Complex- Gray Treefrog (*Dryophytes versicolor*) and Cope's Gray Treefrog (*Dryophytes chrysoscelis*)

Family Hylidae
Subspecies: None currently recognized for either species
Updated 2025

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Description/Identification: The Gray Treefrog and Cope's Gray Treefrogs are the largest species of native Treefrogs in Wisconsin and are also the only "true" hylid Treefrogs in Wisconsin. Adult male Gray Treefrogs range from about 1.57 to 1.96 inches, while females are slightly larger than males, but otherwise appear similar, and reach up to about 2.0 to 2.6 inches. Females also lack a distinctive vocal pouch. Gray Treefrogs have distinctly wide heads, noticeably large toe pads (the largest and most conspicuous among Wisconsin's Treefrogs), and the overall skin and dorsum surfaces are "warty". Inside the mouth, both species of Gray Treefrogs, and other hylid frogs, have only very small, nonpedicellate (or incomplete) teeth on the maxilla and premaxillae weakly attached to the bone, which in many cases, are only calcified at their tips. Their teeth are perhaps most visible only through a high magnification electron microscope. Also inside the front of the mouths of most anurans, Gray Treefrogs included, is a projectile-like tongue made of extremely soft tissue, and which uses reverse adhesion and soft, viscoelastic properties coupled with non-Newtonian saliva.

The dorsal coloration and pattern can be quite variable, varying from white, blackish, gray, brown, light green, or darker green with darker black to grayish dorsal blotches and markings, and there is usually one large middorsal "X" or "star" shaped blotch on the dorsum or back. These dorsal markings and blotches can also vary considerably in color, but are rarely as light as the ground color. The dorsal blotches, which are often distinctly edged in black, may be a darker gray, green, or brown in color. Dark cross-bars or banding are also conspicuous on the fore and hind legs. Juvenile and newly metamorphosized Gray Treefrogs tend to be uniformly green with few to no darker spots or markings.

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Adults also usually have a lighter patch under each eye, and the undersurface or ventral are white or translucent except for the back and inner thighs, which are usually bright orange, to yellow or golden-yellow with or without dark reticulations.

Both Gray and Cope's Gray Treefrog tadpoles appear similar, and have 3 lower labial tooth rows, with the third row being more than one half the length of the second. Gray Treefrog tadpoles range in color from dark green to light yellow-green with golden flecks. The underside is whitish, and the tail fins are large, fan shaped, and are bordered in deep red or orange inter-spotted with black mottling.

Tadpoles. Both Gray and Cope's Gray Treefrog tadpoles are not readily distinguishable visually. © Mike Benard.

The Cope's Gray Treefrog is slightly smaller than the Gray Treefrog, ranging from 1.57 to 2.00 inches for females, and 1.18 to 1.57 inches for males. Cope's Gray Treefrogs also have slightly narrower heads, smoother skin, and the dorsum surfaces are usually a more uniform or lighter green when they are calling. Darker markings, if present on the dorsum surface, are rarely outlined in black, unlike in the Gray Treefrog. However, there are no fully reliable means of visually identifying or distinguishing Cope's gray from Gray Treefrogs except from their chromosome counts and/or by their calls (described below).

Both species of Gray Treefrogs are remarkable color changers, depending on the temperature, mood or reproductive status, and background/environmental colors. Specialized color changing cells in their skin known as chromatophores give these frogs their color changing abilities. Boreal Chorus Frogs (*Pseudacris maculata*) and Spring Peepers (*Pseudacris crucifer*) may be confused with Gray Treefrogs, but have less well-defined toepads, and spring peepers usually have a large, imperfect "X" pattern on the backs. Green color phases may also be confused with the Green Treefrog (*Dryophytes cinereus*). Green Treefrogs, however, do not occur naturally in Wisconsin, and many species of Treefrogs are, or can be "green". Finally, Blanchard's Cricket Frogs (*Acris blanchardi*) are smaller in size, and have less well-developed toe-pads. No subspecies of either the Gray or Cope's Gray Treefrogs are currently recognized.

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Ventral/Belly View (Identical for Cope's and Gray Treefrogs). © Todd Pierson.

Calls and Differences: Gray and Cope's Gray Treefrogs have long been confused with one another, and are nearly identical in physical appearance, or there are at least no reliable methods for being able to visually distinguish them. They were also formerly considered subspecies of the Gray Treefrog (*Dryophytes versicolor*). The Gray Treefrog species complex can only be differentiated by their calls, or by their chromosome counts. Gray Treefrogs are tetraploids, meaning they have twice the normal levels of chromosome counts (four homologous sets of chromosomes), while the Cope's Gray Treefrogs are diploids, having two normal sets of chromosomes.

The only other means of distinguishing gray from Cope's Gray Treefrogs are by the rates and frequencies of their calls. Gray Treefrogs have a slower, more melodic trill that is more bird-like, and which ranges in pulse rate from 14.8 to 29.0 per second from about 64 degrees F. to 75 degrees F. The warmer the temperature, the faster the trill or call rate. The Cope's Gray Treefrog has a much faster, harsher, nasal or insect-like trill ranging from 41.4 to 71.4 pulses per second from 64 degrees F. to 75 degrees F. In addition to their regular calls, male Gray Treefrogs may sometimes emit a higher-pitched 2 or 3 note yelp, or spacing call when other males begin to approach too closely. Female Gray Treefrogs are able to distinguish well the calls of their own species, and hybridization or inter-breeding between Cope's Gray and Gray Treefrogs is not known.


Cope's Gray Treefrog Range (D./H. chrysoscelis), © WDNR

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Gray Treefrog Range (D./H. versicolor), © WDNR

Link to Audio/Call (Both Gray and Cope's Gray): Gray Treefrog & Cope's Gray Treefrog (Hyla versicolor & Hyla chrysoscelis) - YouTube

Range and Distribution: Both Gray and Cope's Gray Treefrogs are sympatric throughout much of the range. Gray Treefrogs have a large, broad range from Manitoba, Ontario, and Nova Scota in southern Canada, throughout much of the eastern United States, with the western tier of their range reaching the Great Plains states (the Dakotas, Nebraska, Kansas, Oklahoma, and eastern Texas. Gray Treefrogs are absent from the peninsula of Florida, however. In Wisconsin, Gray Treefrog complexes are present throughout much of the state except for Gray Treefrogs becoming absent or rare in southeastern Wisconsin, and Cope's Gray Treefrogs being absent from the forested north-central Wisconsin and the Apostle Islands.

Habitat: Gray Treefrogs are a forest and woodland dwelling species, occurring in northern and southern mesic hardwood forests, northern and southern lowland forests, boreal forest, and northern mesic to dry mesic forests, hardwoods, and woodlots. They prefer breeding habitats amongst or nearby to these habitats, which can include shallow woodland ponds, wooded swamps, marshes, puddles or ditches, and ponds in clearings.

After breeding, they are among some of Wisconsin's most arboreal or tree-dwelling frogs, foraging in shrubs or trees anywhere from 6 to 10 meters off the ground. By contrast, Cope's Gray Treefrogs seem to prefer more open or sparsely forested habitats such as prairie ponds, oak savannahs and oak openings, open, dry to dry mesic hardwood or lowland forests, and smaller woodlots or forests adjacent to open areas. Both species can also adapt relatively well to suburban and residential areas, and can often be found seeking refuge in wooden fence or sign posts, rock crevices, underneath bark, wooden birdhouses, or underneath outer shingles or other covered areas of the outsides of houses or buildings.

Feeding and Diet: Adult Gray Treefrogs are insectivorous, and feed primarily on a variety of insects and insect larvae, or other small invertebrates. As tadpoles, Gray Treefrogs feed primarily on algae and other organic detritus in their breeding ponds or other wetlands. Adult Gray Treefrogs are also often attracted to artificial lights which attract insects, and can often be seen on or near streetlights or other exterior

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lights, windows, or the sides of houses or other buildings at night during the summer.

Natural History: Gray Treefrogs begin to emerge from overwintering in early April through May, and remain active throughout the year until mid to late October or November. Both Gray Treefrog complex species will typically call from mid April through early June, although in some areas they may call until early July. Males will usually call while perched from the banks or edges of ponds, marshes, or lakes on logs, or from branches or shrubs from a few centimeters to more than one to two meters off the ground. Male Gray Treefrogs will court females by grasping behind their shoulders with their fore-limbs, in a state known as amplexus. They may also call from floating or submerged plant stems or other aquatic vegetation.

Female Gray Treefrogs may then lay up to 2,000 eggs, either singly or in loose clusters of up to 30 eggs attached to vegetation near the water's surface. The eggs will then hatch in about 3 to 6 days depending on the temperatures, and the tadpoles will fully transform and metamorphosize in another 6 to 8 weeks, by August or September. Warm spring and summer rains induce Gray Treefrogs to begin calling. After breeding, Gray Treefrogs disperse away from their breeding ponds into the surrounding woodlands and other habitats for the summer, where they may be found up to 10 meters off the ground, where they forage for food and seek sheltering places. During times of drought and overwintering, Gray Treefrogs will refuge deep within rotting logs, tree or rock crevices or cavities, and under bark.

Both species of Gray Treefrogs can call from a variety of locations, and both species may call side by side at the same wetlands or breeding sites. Cope's Gray Treefrogs, however, have seldom been observed calling more than about 3 meters off the ground. Few other natural history or biology observations have yet to be made significantly distinguishing the habits of these two closely related species; some presume Gray and Cope's Gray Treefrogs to both be similar in habits and natural history, while others believe that there must be other differences in the circadian rhythms, microhabitats, feeding, or other aspects between the two species.

Gray Treefrogs rely on their cryptic camouflage to defend themselves against potential predators. They may also try to leap away quickly, or expose their brightly colored inner groin and thigh regions to also potentially startle possible predators, and they may also secrete an irritating skin mucous from their skin as a means of discouraging predation.

Natural predators of both Gray and Cope's Gray Treefrogs and their tadpoles can include a variety of large, carnivorous or predatory aquatic insects and/or insect larvae such as water bugs and water beetles, dragonfly larvae, and large spiders, as well as turtles, fish, other frogs and/or amphibian larvae, snakes, a wide array of birds, and many different small to medium sized carnivorous mammals including opossums, skunks, raccoons, shrews, weasels, mink, foxes, and other mammals.

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Conservation Status: In Wisconsin, both Gray and Cope's Gray Treefrogs are listed as "Common". They are still regulated and protected along with all other of Wisconsin's herptiles, however under N.R. 16. Gray Treefrogs, both Gray and Cope's, are currently not protected or regulated federally. Both Gray Treefrogs and Cope's Gray Treefrogs are currently IUCN Red-List Least Concern (LC).