

= Australian green tree frog =

The Australian green tree frog , simply green tree frog in Australia , White 's tree frog , or dumpy tree frog ( *Litoria caerulea* ) is a species of tree frog native to Australia and New Guinea , with introduced populations in the United States and New Zealand , though the latter is believed to have died out . The species belongs to the genus *Litoria* . It is morphologically similar to some other members of the genus , particularly the magnificent tree frog ( *L. splendida* ) and the white @-@ lipped tree frog ( *L. infrafrenata* ) .

Larger than most Australian frogs , the Australian green tree frog reaches 10 cm ( 4 in ) or more in length . Its average lifespan in captivity , about 16 years , is long compared with most frogs . Docile and well suited to living near human dwellings , Australian green tree frogs are often found on window sills or inside houses , eating insects drawn by the light . The green tree frog screams when it is in danger to scare off its foe , and squeaks when it is touched .

Due to its appearance and behavioral traits , the green tree frog is a popular exotic pet throughout the world . The skin secretions of the frog have antibacterial and antiviral properties that may prove useful in pharmaceutical preparations and which have rendered it relatively immune to the population declines being experienced by many species of amphibian . It is a common species and the International Union for Conservation of Nature has assessed its conservation status as being " least concern " .

= = Taxonomy = =

The Australian green tree frog is a member of the New World tree frog family Hylidae and is placed in the subfamily " Pelodyadinae " which is endemic to Australia and New Guinea and includes about 160 species in the genera *Cyclorana* , *Litoria* and *Nyctimystes* . Frogs in the genus *Litoria* are distinguishable from other tree frogs by the presence of horizontal irises and the lack of pigmentation on the eyelids . The common name of the species , " White 's tree frog " , is in honor of John White 's first description in 1790 . The green tree frog was the first Australian frog to be scientifically described ; the original specimen found its way into the collection of Sir Joseph Banks , but was destroyed when the Hunterian Museum at the Royal College of Surgeons in London was bombed in World War II .

The species was originally called the " blue frog " ( *Rana caerulea* ) despite its green color . The specimens White sent to England were damaged by the preservative and appeared blue . The color of the frog is caused by blue and green pigments covered in a yellow layer ; the preservative destroyed the yellow layer and left the frog with a blue appearance . The specific epithet , *caerulea* , which is Latin for blue , has remained . This frog is sometimes referred to as *Pelodyas caerulea* in the scientific literature . In Australia , the frog is also known more simply as the " green tree frog " , but that name is often given to the most common green arboreal species in a region , such as the American green tree frog ( *Hyla cinerea* ) .

= = Description = =

The green tree frog is a plump , rather large tree frog , and can grow up to 11 @. @ 5 cm ( 4 @. @ 5 in ) in length , with fully @-@ grown females being slightly larger than males . There is a distinctive fatty ridge over the eye and the parotoid gland is moderately large . The iris is golden and has a horizontal slit pupil , as is typical of the *Litoria* genus , and the tympanum ( a skin membrane similar to an eardrum ) is visible just behind the eye . The limbs are short and robust and there are large adhesive discs at the end of the digits which provide grip while climbing . The fingers are about one @-@ third webbed , and the toes nearly three @-@ quarters webbed . The dorsal color depends on the temperature and nature of the environment , ranging from brownish- or greyish @-@ green to bright emerald green . The frog occasionally has small , irregularly @-@ shaped white spots on its back . Males have a greyish , wrinkled vocal sac under the throat while the throat of females is white . The ventral surface in both sexes is creamy @-@ white and rough in texture .

This frog is similar in appearance to the magnificent tree frog ( *L. splendida* ), which inhabits only north @-@ western Australia . Older members of that species have very large parotoid glands , which cover the entire top of their heads and droop over their tympana . The parotoid gland of the green tree frog is much smaller , and it also lacks the yellow speckling on the back and the yellow markings on the hand , groin and thigh . It can be distinguished from the giant tree frog ( *L. infrafrenata* ) by the distinct white stripe that that species has along the edge of the lower jaw and extending to the shoulder , which is not present in the green tree frog .

The tadpoles ' appearance changes throughout their development . When newly hatched , they are 8 mm ( 0 @.@ 3 in ) long and when fully developed , 44 mm ( 1 @.@ 7 in ) . They are initially mottled with brown , and increase in pigmentation ( to either green or brown ) during development . Their underside is initially dark but later becomes lighter in hue . The eggs are brown and are wrapped in a clear jelly ; they are 1 @.@ 1 to 1 @.@ 4 millimetres ( 0 @.@ 043 to 0 @.@ 055 in ) in diameter .

The call is a low , slow brawk @-@ brawk @-@ brawk , repeated many times . For most of the year , the frogs call from high positions , such as trees and gutters , but during the breeding season they descend to near the ponds and pools where they will breed . Like many frogs , green tree frogs call not only to attract a mate , but also to advertise their location outside the mating season . They are particularly vocal after rain , but the reasons for this are unclear . They emit a stress call when they are in danger , such as when being attacked by a predator or when a person steps on the log in which one is concealed .

#### = = Distribution and habitat = =

The green tree frog is native to northern and eastern regions of Australia and to the lowlands of New Guinea . Distribution is limited mostly to areas with warm , wet tropical climates . Its range spans from Irian Jaya to Port Moresby , and is most abundant on Daru Island . The International Conservation Union ( IUCN ) suggests " scattered locations " in both New Guinea and Indonesia . In Australia its range extends from the Kimberley region of Western Australia through the Northern Territory and Queensland to north and central New South Wales and the extreme northeasterly part of South Australia . Its total extent of land occupancy is approximately 4 @,@ 078 @,@ 600 square kilometres ( 1 @,@ 574 @,@ 800 sq mi ) .

The species has been introduced to both the United States and New Zealand . In the United States , it is restricted to two regions within Florida , where it was possibly introduced through the pet trade . Only small populations have been found there and it is unknown whether they have caused any ecological damage as an invasive species . In New Zealand , a number of individuals were liberated in various locations in 1897 and 1899 , and a further accidental introduction was made in the 1940s . No sightings have been reported of this species since the 1950s .

Depending on their location , green tree frogs occupy various habitats , but are not usually found in tropical rainforests . They are often found in the canopy of trees near water bodies but also occupy terrestrial habitats well away from water . They favor old stands of Eucalyptus where the trees have hollows in which water collects . They are common along inland waterways and can survive in swamps ( among the reeds ) or in grasslands in cooler climates .

Green tree frogs are little troubled by the presence of man and often live in close association with humans . They sometimes stray inside houses and are found in such places as sinks and toilets . They can also be found on outside windowsills at night , eating insects attracted to the light , and they may gather under outdoor lighting for the same reason . They sometimes occupy tanks ( cisterns ) , downpipes ( downspouts ) , and gutters , as these have high humidity and are usually cooler than the external environment . They may be drawn to the downpipes and tanks during the mating season because the fixtures amplify their calls . Green tree frogs seem to have homing abilities , being able to return to locations from which they were caught from a considerable distance after being displaced .

#### = = Ecology and behavior = =

Green tree frogs are very docile and unafraid of humans . They are nocturnal and come out in early evenings to call ( in spring and summer ) and hunt for food . During the day , they find cool , dark and moist areas , such as tree holes or rock crevices , in which to sleep . They are not a rainforest species but make use of the rain that falls almost daily and collects on leaves and in crevices , to keep themselves moist . Their skin exudes a waxy coating that helps prevent evaporation . In dry periods , they avoid desiccation by concealing themselves in a cool spot , perhaps by burrowing , and enveloping themselves in a cocoon made of shed skin and mucus .

The diet of the green tree frog consists mainly of insects such as moths , cockroaches and locusts . They also eat spiders and can include smaller frogs and even small mammals ( including bats ) among their prey . Frog teeth are not suited to cutting up prey , so the food item must be small enough to fit inside its mouth . Many frogs flick out their sticky tongues at prey and the victim sticks to the tip and is drawn back into the mouth and consumed . A green tree frog will use this technique for smaller prey ; for larger items however , it pounces , then pushes the prey into its mouth with its hands .

The frog has a few native predators , among them snakes and birds . Since the European settlement of Australia , non @-@ native predators have been introduced , primarily dogs and cats . The species has an average life expectancy in captivity of 16 years , but some have been known to live for over 20 years .

#### = = Reproduction = =

Breeding occurs between November and February . During the mating season , the males call from slightly elevated positions close to the still @-@ water sources in which they choose to breed . Clumps of between two hundred and two thousand eggs are laid which initially float , but sink within twenty @-@ four hours . The development of the tadpoles takes about six weeks , after which they undergo metamorphosis and leave the water as juvenile frogs .

#### = = Domestication = =

The green tree frog is one of the most popular pet frogs throughout the world . Its docile nature and long life expectancy make it an attractive choice for exotic @-@ pet owners . It is also one of the easier frogs to maintain : its diet is broad and it has a strong resistance to disease . One problem commonly associated with keeping this species as a pet is overfeeding ; green tree frogs tend to become obese if overfed . In the wild , exertion of energy is required for a frog to capture its prey . However , in captivity , they are usually given live feed in a confined space . This lessens the activity needed for feeding , resulting in weight gain . An overweight member of the species will deposit fat layers over the top of the head and body , giving it a " dumpy " appearance . Thus the name , " dumpy tree frog " .

Fireflies , genus Photinus , are poisonous to lizards , and there has been an incident when a firefly was fed to a green tree frog which subsequently died .

#### = = Conservation = =

Australian law gives protected status to the green tree frog ? along with all Australian fauna ? under the federal Environment Protection and Biodiversity Conservation Act 1999 . The International Union for Conservation of Nature lists the green tree frog 's conservation status as being of " least concern " , given its broad range , its large total population and its tolerance of a variety of habitat types . The population trend seems to be stable , and any decline in numbers is not likely to be at a fast enough rate to justify listing it in a more threatened category .

In suburban areas , this frog is threatened by pollution and by predation by domestic animals . Also , some of the frogs have been found to be infected with the chytrid fungus which causes the fatal amphibian disease chytridiomycosis . The frog 's status in New Guinea is poorly studied , but in

2002 , some 75 @, @ 000 individuals were exported from Indonesia as part of the pet trade and this may impact populations in some locations . The frog is present in a number of protected areas in New Guinea and it has been successfully bred in some Australian zoos . Overall the main threat to this species is the potential for a widespread disease epidemic .

= = Use in research = =

Although frogs have lungs , they absorb oxygen through their skin ; and for this to occur efficiently , the skin must be moist . A disadvantage of moist skin is that pathogens such as molds and bacteria can thrive on it , increasing the chance of infection . To counteract this , frogs secrete peptides that destroy these pathogens . The secretion from the paratoid gland of the green tree frog contains twenty @-@ five caerins , a group of peptides with antibacterial and antiviral properties . It has been found that the caerins produced by frogs of this species from different geographical localities have subtle but reproducible differences . The secretions also contain caeruleins , which have the same physiological effects as CCK @-@ 8 , a digestive hormone and hunger suppressant . These caeruleins now have a number of clinical applications . Several peptides from the skin secretions of the green tree frog have been found to destroy HIV without harming healthy T cells .

The fungus *Batrachochytrium dendrobatidis* , the causal agent of chytridiomycosis , is causing declines in many species of amphibian , but it has been shown that the secretions produced by the green tree frog and certain other Australian species of frog ( *Litoria chloris* and *Litoria genimaculata* ) are protective against this fungus . The peptides inhibit the growth of the fungus in vitro and these frog species are believed not to be in decline .

Green tree frogs are sometimes used as model animals in research . The structure of their toepads was used to investigate the microstructure and properties of the epithelium that allows the animals to adhere to wet surfaces .