Wet Forest Frogs
of South-east Queensland

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FRONT COVER : Southern Orange-eyed Treefrog (Photo : Ed Meyer)
Rainforest Photo : Hugh Nicholson.
Introduction

The frog species described herein live and breed in wet forest north of the Queensland-New South Wales border to Gladstone, and as far west as the Great Dividing Range. The primary habitat of these species is rain and/or wet sclerophyll forest (wet forest). Most occur only in wet forest; a handful also occur in dry forest. Dry forest/woodland species not normally found in wet forest are not included, except in the key (pages 5-12) and similar species sections of some species accounts.

Eleven of the seventeen frog species in this booklet are rare or threatened (Queensland Nature Conservation [Wildlife] Regulation 1994). Most have suffered local declines due to loss or degradation of habitat. Five stream-breeding species however have declined for unknown reasons. Amongst the latter are the Southern Gastric Brooding Frog and Southern Dayfrog, species not seen since the late 1970s.

Species accounts

Details are provided of the appearance, distribution, conservation status, calls, reproductive biology and tadpoles (larvae) of each species within south-east Queensland. The key and descriptions apply mostly to 'adult' specimens (half maximum snout-vent length or greater). Where subadult animals differ markedly from adults (e.g., *Mixophyes* species) information on subadults (colour, size and/or shape) is also provided. Larval descriptions apply to mid to late-stage larvae (i.e., larvae with limb-buds or developing limbs).

Species accounts are based on our own observations and data as well as published literature. A list of references used in the compilation of this booklet is provided on page 56. A glossary of terms (with explanatory diagrams) is included at the back of the booklet (pages 51-53).

Finding & identifying frogs and tadpoles

The easiest way of finding and identifying frogs is by call. Nature Sound has produced a CD entitled 'Australian Frog Calls – Subtropical East' which features calls of all the species mentioned here, except the Southern Dayfrog which was never recorded.
Calling frogs are best located by ‘triangulation’. With this technique three or more people quietly surround the area from which the call emanates. Each person then points in the direction of the call (not where they think the frog is). The location of the frog is in close proximity to the intersection of the pointed lines of direction. By moving in closer and repeating the triangulation the frog can be pinpointed. This technique requires some patience as frogs often stop calling when disturbed. One person can also triangulate by slowly spiralling in on the frog noting the direction of calls from different positions. Some frog species can be induced to call by imitating calls or ‘playing back’ recorded calls.

Frogs may also be found by active searching at night with a torch or headlamp. Active searching is best done on warm, wet nights when frogs are most active. Captured frogs can be held temporarily in clean plastic bags. It is less stressful to them than being held in the hand and allows one to see all the features necessary for identification.

Tadpoles are easily caught with a dip net and best viewed in a plastic bag filled with pond/stream water. Most anatomical features (e.g., the spiracle, labial teeth and vent tube) can only be seen with a hand lens. Note that tadpole colouration varies according to time of day, substrate colour and water clarity (at night, against light backgrounds and in murky water, tadpoles will appear lighter in colour). Colour descriptions are thus intended as a rough guide only.

**Minimising the spread of disease**

There is now considerable evidence that disease has played a major role in declines of wet forest frogs (stream-breeding species in particular) here and abroad. To reduce the risk of spreading disease:

1. Do not move frogs or tadpoles – always release them immediately at the point of capture;
2. Always use clean plastic bags;
3. Clean mud and detritus from shoes, clothing and dip nets after use.

**For more information:**

1. On amphibian declines and disease visit the amphibian diseases web site: www.jcu.edu.au/school/phtm/PHTM/frogs/amphis.htm;

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**Illustrated key to wet forest frogs of south-east Queensland**

With this key, wet forest frogs of south-east Queensland (south of Gladstone, west to and inclusive of the Great Dividing Range) can be identified to species level. These are the species marked with an asterisk, for which detailed species accounts are provided. The accounts include information on similar species, including dry forest or woodland species which at times turn up in wet forest. For confirmation of the identity of dry/forest woodland species consult one of the guides listed in the references section.

1. (a) tips of toes and fingers with distinct discs, circular or oval in shape (FIG. 1a) -- 2

   (b) tips of toes and/or fingers without discs -- 16

2. (a) yellow and black/brown spots/splotches on top of foot (FIG. 2a) -- *Litoria peronii/tyleri/rothii*

   (b) top of foot variable, never as above -- 3

3. (a) dark lateral stripe running from snout to eye, broken in front of eye (FIG. 3a) -- *Litoria nasuta/latopalmata/freycinetii/inermis*

   (b) dark lateral stripe absent or unbroken in front of eye (FIG. 3b) -- 4
4 (a) armpit green/green with black markings (FIG. 4a) -- *Litoria brevipalmata*

(b) armpit variable, never as above -- 5

5 (a) posterior thigh black with yellow or green spots or splotches (FIG. 5a) -- *Litoria lesueuri*

(b) posterior thigh variable, never as above -- 6

6 (a) large black spots in groin area (FIG. 6a) -- 7

(b) groin variable, never as above -- 8

7 (a) transverse row of tubercles between eyes (FIG. 7a); toe pads/finger pads noticeably wider than digits -- *Litoria revelata*

(b) lacking transverse row of low tubercles between eyes; toe pads/finger pads scarcely wider than digits -- *Litoria verreauxii*

8 (a) limbs with dark crossbars; dark ‘X’ on back (FIG. 8a) -- 9

(b) limbs without dark crossbars; no dark ‘X’ on back -- 10

9 (a) toes distinctly flanged (FIG. 9a); found south of Gympie -- *Taudactylus diurnus*

(b) flanging indistinct; found north of Gympie -- *Taudactylus pleione*

10 (a) posterior thigh neither pink, orange, brick-red nor purple in colour -- *Litoria rubella/dentata/inermis*

(b) posterior thigh pink, orange, brick-red or purple in colour -- 11

11 (a) dorsum green; iris bright red to orange-red out towards periphery (FIG. 11a) -- *Litoria chloris*

(b) dorsum green and/or brown; iris variable, never as above -- 12

12 (a) snout pointed, sloping back towards mouth (when viewed side-on) (FIG. 12a) -- *Litoria fallax/olongburensis*

(b) snout blunt, gently rounded (FIG. 12b) -- 13
13 (a) dorsum coarsely granular and green (FIG. 13a); posterior thigh purple/crimson in colour -- *Litoria gracilenta*
(b) dorsum smooth, variable in colour; posterior thigh variable, never as above -- 14

14 (a) dark lateral stripe, fringed with gold, running from snout, through eye, passing over tympanum (FIG. 14a) -- 15
(b) dark lateral stripe indistinct or lacking; if present, not passing over tympanum
-- *Litoria caerulea/cooloolensis*

15 (a) heels and feet white- or gilt-edged (FIG. 15a) -- *Litoria pearsoniana* *
(b) heels and feet never white- or gilt-edged (FIG. 15b) -- *Litoria subglandulosa*

16 (a) tympanum distinct (FIG. 16a) -- 17
(b) tympanum hidden or absent (FIG. 16b) -- 23

17 (a) pupil forms vertical slit when constricted (FIG. 17a) -- 18
(b) pupil variable, never as above -- 21

18 (a) posterior thigh black with yellow spots (FIG. 18a) -- *Mixophyes iteratus* *
(b) posterior thigh variable but never as above -- 19

19 (a) snout-vent length greater than 45 mm -- 20
(b) snout-vent length less than 45 mm -- see table page 13

20 (a) upper third of iris distinctly paler than lower two thirds (FIG. 20a) -- *Mixophyes fleayi* *
(b) iris uniform dark brown, sometimes with gold or copper flecks in upper third (FIG. 20b) -- *Mixophyes fasciolatus* *
21 (a) outer metatarsal tubercle well-developed (FIG. 21a) -- *Bufo marinus*

(b) lacking outer metatarsal tubercle -- 22

22 (a) underside of feet black -- *Lechriodus fletcheri*

(b) underside of feet not black -- *Cyclorana* species

23 (a) toes fully webbed -- *Rheobatrachus silus*

(b) toes not fully webbed -- 24

24 (a) inner and outer metatarsal tubercles well-developed, roughly equal in size (FIG. 24a)

-- *Uperoleia fusca/laevigata/rugosa*

(b) lacking outer metatarsal tubercle; if present, outer metatarsal tubercle much smaller than inner metatarsal tubercle -- 25

25 (a) belly and underside of legs grey to black with white marbling or mottling (FIG. 25a) -- 31

(b) underside variable, never as above -- 26

26 (a) belly coarsely granular (FIG. 26a)

-- *Crinia parinsignifera/deserticola/tinnula*

(b) belly smooth or nearly so (FIG. 26b); if granular, finely granular -- 27

27 (a) distinct glandular stripe running from eye past corner of mouth (FIG. 27a) -- *Limnodynastes* species

(b) aforementioned glandular stripe indistinct or absent -- 28

28 (a) belly smooth and white

-- *Limnodynastes ornatus / Neobatrachus sudelli*

(b) belly variable, never as above -- 29

29 (a) underside bright yellow -- *Kyarranus kundagungan*

(b) underside variable, never bright yellow -- 30

30 (a) first finger rudimentary (less than one third length of second finger) (FIG. 30a) -- *Assa darlingtoni*

(b) first finger one third the length of second finger or longer (FIG. 30b)

-- *Kyarranus loveridgei*
31 (a) red in groin and on ‘calf’ (FIG. 31a) -- *Adelotus brevis*

(b) no red in groin or on ‘calf’ -- 32

32 (a) glandular stripe running from eye past corner of mouth (FIG. 32a) -- *Limnodynastes dumerilii*

(b) lacking glandular stripe -- 33

33 (a) yellow spot/streak just above vent (FIG. 33a) -- *Pseudophryne major*

(b) lacking yellow spot/streak above vent -- 34

34 (a) dorsum red, orange-red or burgundy in colour; dark dorsolateral stripe continuous from snout to groin area (FIG. 34a) -- *Pseudophryne raveni/coriacea*

(b) dorsum variable, seldom uniform red or burgundy; if present, dark dorsolateral stripe broken above arm (FIG. 34b) -- *Crinia signifera*
Status & Distribution: common in lowlands east of the Dividing Range; has declined/disappeared from some upland areas (e.g., Main Range, Bunya Mountains).

Description: medium sized (SVL up to 50 mm); stout; largely terrestrial; grey, beige or brown above, with irregular dark markings; dorsum rough; underside smooth with black and white or grey and white marbling/mottling; red and black marbling in groin, also on ‘calf’; paired ‘tusks’ at front of lower jaw, (visible when mouth open); male larger, with broader head and larger ‘tusks’; fingers and toes with rudimentary webbing, no discs on fingers or toes; second finger of females flanged.

Call: a soft ‘p-tuk’ or ‘p-t-tuk’, calls at night and by day (from cover).

Similar species: may be confused with Lechriodus fletcheri, Rheobatrachus silus, some Limnodynastes, Uperoleia, Pseudophryne, Taudactylus and Crinia species. Distinguished from L. fletcheri and R. silus by black and white/grey and white mottling or marbling on underside. Distinguished from Pseudophryne, Crinia and Taudactylus species by red in groin and on ‘calf’. Distinguished from Uperoleia species by red on ‘calf’.

Habitat: found in rain forest and wet sclerophyll forest, (occasionally dry forest) under logs and in hollows/rock crevices, beside streams and ponds.

Breeding: breeds during spring and summer; amplexus inguinal; foam nest with unpigmented eggs deposited at waters edge, amongst rocks or debris, often attended by male. Larvae may overwinter in upland streams; average clutch size 215 eggs.

Larvae: deep-bodied, ovoid with rounded snout and slender-tail; tail twice as long as body; dark brown to black above; dark grey below; eyes dorsolateral; low-finned; fins translucent, suffused with black; tail musculature grey-brown, darkest anteriodorsally; tail tip rounded; vent tube dextral; spiracle sinistral, opening laterally; mouth terminal; labial tooth row formula 4·5 (3·5)/3 (1); oral disc surrounded by papillae except for anterior gap; max. length approx. 35 mm.
**Australian Marsupial Frog**

*Assa darlingtoni*

**Status & Distribution**: rare. D’Aguilar Range, Border ranges, Conondale and Blackall ranges.

**Description**: small (SVL up to 25mm); terrestrial; variable in colour; yellow, beige, orange-brown, or olive-grey above, often with dark vertebral band or 'V' shaped markings down back; dorsum and underside generally smooth, occasionally slightly granular; sides grey to red-brown; dark bar below eye; underside grey or off-white peppered with brown or black; fingers and toes without webbing; no distinct discs on fingers or toes; tips of toes slightly expanded; first finger rudimentary (less than one third length of second finger); males with 'hip pockets' near groin.

**Call**: insect-like 'tch-tch-tch-tch', heard day or night almost anytime of year, mostly under wet conditions.

**Similar species**: similar to *Crinia* and *Kyarranus* species. Distinguished from *Crinia* species by mostly smooth belly (belly coarsely granular in *Crinia* species). Distinguished from *Kyarranus* species by rudimentary first finger (less than one third the length of second finger).

**Habitat**: highly cryptic, found under leaf litter and rotting logs in rainforest, antarctic beech and wet sclerophyll forest over 150m above sea level.

**Breeding**: breeds during spring and summer; large, unpigmented eggs laid in leaf litter, attended by male; on hatching, larvae wriggle into the 'hip pockets' of attendant males; larvae develop within 'hip pockets', emerging as metamorphs; average clutch size 11 eggs.

**Larvae**: globular with narrow, low-finned tail; lacking labial teeth and horny beak. Hatchling larvae white.
Red-and-yellow Mountain-Frog

Status & Distribution: rare; Main Range.

Description: small (SVL up to 35 mm); terrestrial; variable in colour; yellow-orange, burgundy or dark brown above, often with 'V' shaped markings down back; dorsum smooth; dark lateral stripe running from tip of snout, past eye, to forearm; underside bright yellow, smooth; fingers and toes free of webbing; no discs on toes or fingers; first and second fingers flanged in females; metamorphs blackish with white speckling on undersurface.

Call: a guttural 'ork' or 'wok'; heard day and night during spring and summer. Males call from cavities amongst rocks and/or leaf litter.

Similar species: similar to *Assa darlingtoni* and *Kyarranus loveridgei*. Distinguished from both by bright yellow underside.

Habitat: highly cryptic, found in rainforest and wet sclerophyll forest (above 500 m altitude), under leaf litter, rocks and logs along seepage lines and streams.

Breeding: breeds during spring and early summer; large unpigmented eggs in foam or gelatinous mass in muddy hollow, under leaf litter, rotting logs, and rocks, along seepage lines or streams; larvae develop within hollows (similar to *K. loveridgei*, p. 49); clutch size unknown.

Larvae: ovoid with long, slender tail; eyes dorsolateral; snout rounded; tail twice as long as body, sometimes longer; brown above (darkest over braincase and intestinal mass); heart, lungs and intestinal mass visible from below; tail low-finned; tail tip rounded; tail musculature lightly pigmented, darkest anteriodorsally; fins lightly pigmented; spiracle sinistral, opening ventrolaterally; vent tube medial; mouth subterminal; lacking labial teeth; oral disc surrounded by papillae except for anterior gap; max. length approx. 20 mm.
Status & Distribution: rare; Border ranges; taxonomy under review.

Description: small (SVL up to 35 mm); terrestrial; orange-brown to grey above, often with darker markings; dorsum granular with low ridges and scattered tubercles; dark lateral stripe running from snout back through eyes to forearm; underside smooth, variable in colour (throat usually mottled brown, belly with or without dark mottling/splotches); second finger flanged in females; fingers and toes free of webbing; no discs on toes or fingers; toe tips slightly expanded; first finger at least one third length of second finger, usually longer (i.e., at least half as long).

Call: a gutteral 'ork' or 'wok'; heard day and night during spring and early summer. Males call from hollows under rocks and leaf litter along stream banks or seepage areas.

Similar species: similar to Assa darlingoni and Kyarranus kundagungan. Distinguished from A. darlingoni by larger first finger (at least a third as long as second finger). Distinguished from K. kundagungan by belly colouration (white with brown flecking vs yellow in K. kundagungan).

Habitat: highly cryptic; found in rainforest, antarctic beech and wet sclerophyll forest (above 500 m altitude), under leaf litter, rocks and logs in damp soil.

Breeding: breeds during spring and early summer; large unpigmented eggs in foam mass laid in muddy hollow amidst rocks, under leaf litter and rotting logs; larvae develop within hollows (see photograph on p. 49); average clutch size 25 eggs.

Larvae: ovoid with long, slender tail; eyes dorsolateral; snout rounded; tail twice as long as body, sometimes longer; beige to brown above (darkest over braincase and intestinal mass); heart, lungs and intestinal mass visible from below; tail low-finned; tail tip rounded; tail musculature lightly pigmented, darkest anteriodorsally; fins very lightly pigmented; spiracle sinistral, opening ventrolaterally; vent medial; mouth subterminal; lacking labial teeth; oral disc surrounded by papillae except for anterior gap; max. length approx. 20 mm.
**Black-soled Frog**

*Lechriodus fletcheri*

**Status & Distribution:** rare; Border and Main ranges.

**Description:** medium sized (SVL up to 50 mm); terrestrial; red-brown to yellow above; dorsum with low warts and ridges, sandpaper-like in texture in males; ‘vein-like’ ridges running along back and legs; a dark stripe, usually broken, runs from the nostril, through the eye, and over the tympanum, breaking up around the shoulder; underside smooth, off-white; hindlimbs usually barred; underside of feet black; fingers and toes with only rudimentary webbing; no discs on toes or fingers; tips of toes and fingers slightly expanded; first and second fingers flanged in females.

**Call:** a guttural ‘ok-ok-ok’ or ‘orrrp’; heard during spring and summer, after rain. Males call from temporary ponds.

**Similar species:** similar to *Adelotus brevis* and *Mixophyes* species; distinguished from *A. brevis* by underside colouration (off-white vs. black and white/grey and white marbling in *A. brevis*). Distinguished from *Mixophyes* species by shape/orientation of pupil when constricted (horizontal oval vs vertical slit in *Mixophyes* species) and extent of webbing in toes (little or no webbing vs extensive webbing in *Mixophyes* species).

**Habitat:** found in rain forest and wet sclerophyll forest, often some distance from water.

**Breeding:** prefers still water, usually utilising small temporary ponds in rainforest (including tree-hollows near the ground and roadside puddles); will breed in ponds beside streams and, during dry periods, isolated pools in stream bed; amplexus inguinal; pigmented eggs laid in foam nest; larvae develop rapidly metamorphosing in 3 - 4 weeks; average clutch size 300 eggs.

**Larvae:** flat-bodied, ovoid with slender tail; eyes dorsal and medial; snout rounded; tail twice as long as body; light brown to grey above (darkest over braincase and intestinal mass); underside unpigmented; intestinal mass, heart and gills visible from below; low-finned; fins translucent, with dark stippling; tail musculature light brown to grey with irregular dark markings: darkest anteriodorsally; vent tube medial; spiracle sinistral, opening laterally; mouth subterminal; oral disc surrounded by papillae except for anterior gap; labial tooth row formula 5-6(2-6)/3(1) ; max. length approx. 35 mm.
**Great Barred-Frog**

*Mixophyes fasciolatus*

**Status & Distribution:** common and widespread.

**Description:** large (SVL up to 80 mm) with broad head and powerful legs; terrestrial; beige or brown above; dorsum finely granular often with irregular dark markings and/or dark vertebral band; vertebral band irregular in shape, often discontinuous; underside smooth, off-white, very occasionally yellowish; throat usually dusted black; dark spots and splotches along flanks; barring on legs usually well-defined; lateral stripe begins as a triangular patch, passing through the nostril, eye and over the tympanum, ending abruptly past the tympanum; pupil forms vertical slit when constricted; in adults iris usually dark brown, occasionally with gold flecking in upper iris, subadults and metamorphs may have wholly red or orange-red iris; in adults upper lip usually distinctly paler than above without splotches/spots (except for tip of snout); in subadults and metamorphs, the upper lip may be splotched or spotted; inner metatarsal tubercle as long as innermost toe; three joints of fourth toe free of webbing; fingers free of webbing; no discs on toes or fingers.

**Call:** a plaintive ‘wah’ or ‘wark’; heard at night during spring and summer. Occasionally a quieter trilling call or guttural ‘ork’. Males may call from under leaf litter or out in the open.

**Similar species:** similar to both *Mixophyes fleayi* and *Mixophyes iteratus* - for distinguishing features see table, p. 13. Also similar to *Lechriodus fletcheri*. Distinguished from *L. fletcheri* by (1) vertical orientation of the pupil when constricted (horizontal in *L. fletcheri*) and (2) extent of webbing between toes (extensive vs little or no webbing in *L. fletcheri*). Also similar to *Limnodynastes* species. Distinguished from latter by absence of glandular stripe below eye and/or more extensive webbing.

**Habitat:** usually associated with wet sclerophyll forest and rain forest; mostly found buried under leaf litter. Also found in disturbed areas (e.g., around farm dams) and occasionally dry forest.

**Breeding:** breeds during spring, summer and autumn; amplexus inguinal; pigmented eggs laid on rocks or banks overhanging pools in streams or ponds (see p. 49); larvae may overwinter; average clutch size 949 eggs.

**Larvae:** deep-bodied, ovoid with gently rounded snout; light-brown to grey above with dark patch at base of tail; underside silver-grey to silver-white; eyes dorsolateral; tail twice as long as body, thick, muscular and low-finned; fins translucent usually with large dark spots/splotches; tail musculature light with large dark spots/splotches; spiracle sinistral, opening laterally; vent tube dextral; mouth subterminal; oral disc surrounded by papillae; labial tooth row formula 6-12(2-12)/3(1); max. length approx. 120 mm.
**Fleay’s Barred-Frog**  
*Mixophyes fleayi*

**Status & Distribution:** endangered. Currently known from the Conondale, Border and Main ranges, historically from Bunya Mountains and Mount Tamborine.

**Description:** similar in most respects to *M. fasciolatus*; underside bright yellow or lemon yellow in colour, occasionally white; upper lip usually marked with darker spots/splotches; upper third of iris paler than lower iris - pale-brown, yellowish, silvery, to blue in colour (most obvious when pupil constricted); slightly larger than *M. fasciolatus* (SVL up to 90 mm); head narrower, more pointed and legs longer compared with *M. fasciolatus*. Three joints of fourth toe free of webbing; fingers free of webbing; no discs on toes or fingers.

**Call:** a throaty ‘ok-ok-ok-ok-ok-ok’, occasionally a long rasping ‘arrrrrr’, or growling call. Males call from leaf litter or rocks beside streams.

**Similar species:** similar to both *Mixophyes fasciolatus* and *Mixophyes iteratus* - for distinguishing features see table, p. 13. Similar also to *Lechriodus fletcheri*. Distinguished from *L. fletcheri* by (1) vertical orientation of the pupil when constricted (horizontal oval in *L. fletcheri*) and (2) extent of webbing between toes (extensive vs little or no webbing in *L. fletcheri*). Also similar to *Limnodynastes* species. Distinguished from latter by absence of glandular stripe below eye and/or more extensive webbing.

**Habitat:** lives along montane forest streams, usually within or in close proximity to rainforest; may be found some distance from water.

**Breeding:** breeds in montane streams most times of the year; amplexus inguinal; pigmented eggs laid in gravel, leaf litter, or on bedrock in shallow riffles (see p. 49); larvae overwinter in upland streams; clutch size up to 1000 eggs.

**Larvae:** body fusiform; tail twice as long as body; eyes dorsolateral; uniform grey-brown above (later stage larvae may develop dark spots and splotches); underside silver-grey with silver-blue sheen; intestinal mass fully obscured, heart and gills just visible; thick muscular tail; tail low-finned; fins opaque, grey with scattered dark spots/splotches (not as conspicuous as in *M. fasciolatus*); tail musculature light-brown/grey with dark spots/splotches; limb buds and vent tube lie within translucent ‘skirt’ at base of tail; spiracle sinistral, opening lateroventrally; vent tube dextral; mouth sub-terminal; oral disc large, surrounded by papillae; labial tooth row formula 10(2-10)/3(1); max. length approx. 100 mm.
Status & Distribution: endangered. Currently known from Coomera, Caboolture, Stanley, Mary, Maroochy & Mooloola River catchments; historical records from Bunya Mountains and Main Range.

Description: largest of the barred-frogs (SVL up to 120 mm); terrestrial; beige to dark brown above, with irregular dark markings; underside smooth, white to yellow in colour; upper lip with numerous dark spots/splotches; forearm, fingers and toes often reddish; lateral stripe begins as a triangular patch, passing through the nostril, eye and over the tympanum, ending abruptly just past the tympanum; upper half of iris yellow-gold, golden brown below; pupil vertical when constricted; barring on legs usually well-defined; posterior of thigh black with yellow spots/splotches; flanks and groin heavily mottled; inner metatarsal tubercle only half as long as innermost toe; two joints of fourth toe free of webbing; no discs on toes or fingers.

Call: a deep guttural ‘woh’, occasionally a quiet, horse-like whinny. Males call from leaf litter or out in the open.

Similar species: similar to both *Mixophyes fasciolatus* and *M. fleayi* - for distinguishing features see table, p. 13. Also similar to *Lechriodus fletcheri*. Distinguished from latter by (1) vertical orientation of the pupil when constricted (horizontal in *L. fletcheri*) and (2) extent of webbing between toes (extensive vs little or no webbing in *L. fletcheri*). Also similar to *Limnodynastes* species. Distinguished from latter by absence of glandular stripe below eye and/or more extensive webbing.

Habitat: streams and rivers in wet sclerophyll and rain forest (see p. 49). Often found half buried under leaf-litter. Adults, especially females, may be found some distance (up to 150m) from water.

Breeding: summer breeder; amplexus inguinal; pigmented eggs laid beneath overhanging rocks or banks of larger pools in streams; larvae may overwinter; average clutch size 2172 eggs.

Larvae: deep-bodied, ovoid; tail twice as long as body; eyes dorsolateral; yellow-brown above with dark spots/splotches and dark patch at base of tail; underside silver-white; intestinal mass obscured, heart and lungs mostly visible from below; tail thick and muscular; low-finned; fins opaque with dark flecking (except anterior half of ventral fin); tail musculature with dark flecking/spots and/or splotches; spiracle sinistral, opening lateroventrally; vent tube dextral; oral disc surrounded by papillae; labial tooth row formula: 6(3-6)/3 (1); max. length greater than 100 mm.
Red-backed Broodfrog  

*Pseudophryne coriacea*

**Status & Distribution:** common; Border and Main ranges and Great Dividing Range north to Crows Nest, also on Mount Tamborine.

**Description:** small (SVL up to 35 mm); fully terrestrial (crawls rather than hops); lacking tympanum; orange-red to burgundy above with or without dark flecking; dorsum smooth with low ridges and/or scattered tubercles; underside granular or smooth with black and white marbling; no discs on toes or fingers; no webbing between toes.

**Call:** drawn out ‘ehhhk’ (much like a ratchet), heard almost any time of year; males call from cover often some distance from water, even during dry periods.

**Habitat:** inhabits wet and dry forest; found under debris, leaf litter and amidst rock crevices.

**Similar species:** similar to *Adelotus brevis*. Distinguished from latter by absence of red on ‘call’. Also similar to *Pseudophryne major* and *P. raveni*. Distinguished from *P. major* by absence of yellow streak/spot above vent. Indistinguishable from *P. raveni* except for call: ratchet-like ‘ehk’, with upward inflection in *P. raveni*; without upward inflection in *P. coriacea*.

**Breeding:** breeds almost any time of year; amplexus inguinal; large pigmented eggs laid on land (in moist soil under rocks, logs and leaf-litter) (see p. 50); larvae hatch from eggs following rain and are washed into or wriggle their way into water-filled ditches, ponds and/or creeks; clutch size unknown.

**Larvae:** deep-bodied, rotund with rounded snout; tail slender, 1.5 times length of body; eyes dorsolateral; dark or light-brown above; underside with gold flecking; intestine, heart and gills visible from below; low-finned; tail musculature brown with or without irregular dark markings; fins translucent with dark stippling; tail tip rounded; spiracle sinistral, opening laterally; vent tube dextral; mouth sub-terminal; papillae mostly at sides of oral disc (none anterior or posterior); labial tooth row formula 2(2)/3(1); max. length approx. 30 mm.
**Status & Distribution:** endangered (possibly extinct); last seen 1981; known previously from the Blackall and Conondale ranges.

**Description:** medium sized (SVL up to 57 mm); largely aquatic; grey-brown to dark grey above; dorsum rough; underside smooth, white or off-white (except for yellow on legs); snout blunt, eyes and nostrils directed upwards; toes fully webbed; tips of fingers and toes slightly expanded; body covered with thick mucus.

**Call:** a pulsed call with upward inflection: ‘aaaeehm…aaaeehm’ or ‘auwhm…auwhm’; heard during spring/summer. Males call from exposed rocks, or rock crevices near water after rain.

**Similar species:** most similar to *Adelotus brevis*; distinguished from *A. brevis* by fully-webbed toes, ventral colouration (white/off-white vs black and white marbling in *A. brevis*) and groin colouration (yellow-white vs red and black in *A. brevis*).

**Habitat:** lives along rocky streams in rainforest over 350m above sea level; mostly found in rock pools with stones and leaf litter (see p. 48); known only from the Blackall and Conondale ranges. Active by night or day.

**Breeding:** breeds during summer; reproductive strategy (gastric brooding) unique to frogs of the genus *Rheobatrachus*. Larvae are brooded in the stomach of females. Development and metamorphosis take place within the stomach. Once metamorphosis is completed, froglets are ‘coughed up’ one at a time. Average clutch size 33 eggs.

**Larvae:** bulbous, pale, low-finned without keratinized mouth-parts.
Southern Dayfrog

*Taudactylus diurnus*

**Status & Distribution:** endangered (possibly extinct); last seen 1979; known previously from Mount Glorious, Blackall and Conondale ranges.

**Description:** small (SVL up to 30 mm), most active by day; brown or grey-brown above with dark bar between eyes and butterfly or 'X' shaped marking on back; dorsum with numerous small warts and low ridges; limbs barred; underside pale yellow to grey with darker spots/splotches; toe pads elliptical with dorsal medial groove; fingers and toes unwebbed; toes distinctly flanged.

**Call:** a soft 'chuckling', heard during spring and summer. Males call during the day.

**Similar species:** similar in appearance to *Crinia* species and *Adelotus brevis*; distinguished from these by discs on toes and fingers and distinctly flanged toes.

**Habitat:** found along rocky rainforest streams over 300 m above sea level (see p. 48); most active by day.

**Breeding:** breeding takes place during summer; amplexus inguinal; pigmented eggs laid under submerged rocks or branches along streams; larvae may overwinter; average clutch size 19 eggs.

**Larvae:** deep-bodied, globose with rounded snout; tail 1.5 times length of body; eyes dorsolateral; dark above; intestine visible from below; tail tip rounded; fins with dark stippling/flecking; musculature light with dark stippling/flecking; vent tube dextral; spiracle sinistral, opening laterally; oral disc expanded and umbrella-like, surrounded by papillae; no labial teeth; max. length unknown.
Kroombit Tinker-Frog  
*Taudactylus pleione*

**Status & Distribution:** vulnerable; known only from Kroombit Tops, near Gladstone.

**Description:** small (SVL up to 35mm); terrestrial; grey to red-brown above with butterfly or ‘X’ shaped marking on back and dark bar between eyes; dorsum generally smooth, with scattered tubercles; sides grey to grey-brown; dark lateral stripe running back from snout, past eye to forearm; underside with cream and grey mottling and/or speckling, smooth; discs on toes and fingers small; fingers and toes without webbing; toes flanged, but flanging indistinct.

**Call:** a high-pitched ‘tink-tink-tink-tink..’ fast at first, slowing towards end of call; heard during spring and summer, at dusk and at night, occasionally during the day. Males call from rock crevices or, less commonly, out in the open.

**Similar species:** may be confused with *Crinia signifera*, *Pseudophryne* species or *Adelotus brevis*. Distinguished from *Pseudophryne* species by underside colouration (cream with grey-brown mottling/speckling vs black and white marbling in *Pseudophryne* species), from *A. brevis* by absence of red and black marbling in groin and from *C. signifera* by smooth belly (coarsely granular in *C. signifera*).

**Habitat:** highly cryptic; occurs in rainforest and palm forest along seepage lines and streams (see p. 48); found amongst rock piles; in rolled up palm fronds and occasionally sitting out.

**Breeding:** unknown. Gravid females found in summer with large, unpigmented eggs.

**Larvae:** unknown.
**Southern Orange-eyed Treefrog**  
*Litoria chloris*

**Status & Distribution:** common and widespread.

**Description:** medium sized (SVL up to 65 mm); mostly arboreal; green above, occasionally with yellow spots/splotches; dorsum smooth; underside yellow to off-white, granular; iris pale pink or orange, bright red out towards periphery; posterior thigh purple; toes and fingers two-thirds to three-quarters webbed; tips of toes and fingers with large discs. Metamorphs yellow-green above with pale upper lip; iris orange-gold in colour.

**Call:** drawn-out moan 'nyaaaaghh.' repeated several times, followed by soft trill ('prrr-prrr'), heard in spring and summer usually after heavy rain. Males call from vegetation overhanging water or nearby rocks.

**Similar species:** most like *Litoria gracilenta*. In *L. gracilenta*, however, the dorsum is granular and iris orange-brown centrally grading to yellow out towards periphery. In contrast with *L. chloris*, a thin yellow stripe usually extends from the nostril beyond the eye.

**Habitat:** inhabits rainforest and wet sclerophyll forest.

**Breeding:** breeds in spring and summer after heavy rains; amplexus axillary; jellied eggs (pigmented) laid in shallow pools beside or along streams, and temporary ponds in forest (see p. 50); average clutch size 1364 eggs.

**Larvae:** deep-bodied, ovoid with rounded snout; eyes dorsolateral; tail slender, twice as long as body; brown to dark-brown above, darkest over braincase and intestinal mass; underside silver, intestinal mass obscured, gills and heart visible except in late-stage larvae; low-finned; fins transparent with dark stippling/flecking; tail tip rounded or pointed; tail musculature light brown to grey, darkest anteriodorsally; spiracle sinistral, opening laterally; vent tube dextral; oral disc surrounded by papillae except for anterior gap; labial tooth row formula 2(2)/3(1); max. length approx. 45 mm.
Status & Distribution: common and widespread; declines reported from rainforest.

Description: females large (SVL up to 70mm); males considerably smaller (SVL up to 43 mm); variable in colour; males yellow above when breeding, brown at other times; females brown or grey-brown above; dorsum smooth or finely granular with faint dark speckling; underside white and granular except for throat which is smooth (in males the throat is partly mottled). In females and non-breeding males a dark stripe extends uninterrupted from the nostril back past the eye, passing over the tympanum and forearm eventually breaking up along the flank; groin and posterior of thigh black with yellow, yellow-green or bright green spots/splotches; tips of toes and fingers with disc-like pads; toes two-thirds to three-quarters webbed; largely terrestrial.

Call: a soft, barely audible, purring - ‘d Orrr-d Orrr-d Orrr.’ - lasting 1 or 2 seconds. Males call from rocks beside water.

Similar species: similar to Litoria latopalmata, L. inermis and L. brevipalmata. Distinguished from L. latopalmata by unbroken canthal stripe (in L. latopalmata the dark stripe running from the nostril to the eye, is ‘broken’ in front of the eye). Distinguished from L. inermis by smooth dorsum (rough/warty in L. inermis). Distinguished from L. brevipalmata by armpit colouration (green with or without black splottoches in L. brevipalmata) and lip colour (matching dorsum in L. lesueuri; noticeably paler in L. brevipalama). Habitat: found in a wide range of habitats (dry and wet forest). Breeds along rocky streams; may be found sitting on rocks, amidst leaf litter and occasionally on low vegetation beside streams.

Breeding: breeds during spring and summer; amplexus axillary; jellied, pigmented eggs adhere to rocks and bottom sediments of pools along streams; average clutch size 2438 eggs.

Larvae: deep-bodied, fusiform with angular snout; eyes laterodorsal; tail twice as long as body; light-brown to dark-brown above with dark markings spots/splotches; dark bar prominent at base of tail; silver below; intestinal tract obscured; heart and lungs visible from below in early stage larvae; tail musculature light-brown with black and/or with irregular dark markings; high-finned; fins with dark stippling; tail tip pointed; spiracle sinistral, opening ventrolaterally; vent tube dextral; oral disc surrounded by papillae; labial tooth row formula 2/3; max. length approx. 45 mm.
Cascade Treefrog  

**Litoria pearsoniana**

**Status & Distribution:** endangered; has declined in past; occurs in most ranges in south-east Queensland; historical but no recent records from Girraween National Park.

**Description:** small (SVL up to 40 mm); predominantly arboreal; variable in colour; bright green and/or beige above, often peppered with black, occasionally mottled brown; dorsum smooth; underside white, granular (except for throat); tips of toes and fingers with disc-like pads; dark stripe running back from nostril, passing through eye, extending to and encompassing flank; thin gold stripe running back from snout above the eye and tympanum; tympanum beige or olive-brown (occasionally green), bordered by green; groin and back of thighs beige or orange-red in colour; snout blunt when viewed side-on; heel and outside of foot white- or gilt-edged; toes fully webbed. Metamorphs usually beige above with white spot below eye; underside typically yellow.

**Call:** a crisp 'wreek-kik' or 'kik-kik', calls mostly at night from rocks and low vegetation beside streams.

**Similar species:** similar in appearance to *Litoria subglandulosa* and *L. fallax*. Distinguished from *L. subglandulosa* by white- or gilt-edged heel and foot. Distinguished from *L. fallax* by snout profile (viewed side-on): angular (sloping back towards mouth) in *L. fallax* vs blunt in *L. pearsoniana*.

**Habitat:** associated with wet forest streams (see p. 48), usually found on low vegetation within 1-2m of stream.

**Breeding:** breeding takes place in spring, summer, and occasionally autumn; amplexus axillary; jellied, pigmented eggs attached to rocks, vegetation or debris in pools along streams. Larvae may overwinter in upland streams; average clutch size 499 eggs.

**Larvae:** body globose; tail 1.5 times as long as body; eyes dorsolateral; dark-grey to brown above, darkest over braincase and intestinal mass; underside with silver stippling, intestinal mass, heart and lungs visible from below; low-finned; fins translucent with dark stippling; tail musculature light brown to grey, darkest anteriodorsally; spiracle sinistral, opening ventrolaterally; vent tube dextral; oral disc surrounded by papillae except for anterior gap; labial tooth row formula 2(2)/3; max. length approx. 40 mm.
Status & Distribution: rare; in south-east Queensland, known only from wet forest areas along the Queensland-New South Wales border.

Description: small to medium sized (SVL up to 50 mm); largely arboreal; breeding males yellow; females and non-breeding males pale brown to red-brown in colour; in some animals a dark vertebral band extends from the eyes, down the back to the vent; a dark lateral stripe extends from the nostril back, passing through the eye and tympanum, to the shoulder; underside off-white and (except for throat) coarsely granular; throat orange to yellow in breeding males; groin yellow or orange with black spots/splotches; posterior thigh bright orange usually with one or more dark spots; finger and toe discs conspicuously broader than digits; transverse row of tubercles (usually 4) between eyes.

Call: similar to, but higher pitched and faster than, that of *L. verreauxii*; a high pitched whirring, 'ree-ree-ree..', heard any time of year.

Similar species: similar to *Litoria verreauxii*, *L. rubella* and *L. dentata*. Distinguished from *L. verreauxii* by transverse row of raised tubercles between eyes (vs none or one or two scattered tubercles in *L. verreauxii*) and toe pad size (scarcely broader than digits in *L. verreauxii* vs conspicuously broader than digits in *L. revelata*). Also resembles *L. rubella* and *L. dentata*. Distinguished from these by spots/splotches in the groin and thighs (present in *L. revelata*, absent in *L. rubella* and *L. dentata*).

Habitat: found in a variety of montane habitats including wet and dry sclerophyll forest; occasionally found in disturbed areas. (e.g., farmland).

Breeding: breeds in ponds (see p. 50) and occasionally streams; amplexus axillary; eggs jellied and pigmented; larvae present all year round; average clutch size (Atherton Tableland) 787 eggs.

Larvae: deep-bodied ovoid, with angular snout; tail 1.5 times to twice as long as body; eyes laterodorsal; light to dark grey above (usually with light bluish sheen), darkest over brain case and intestinal mass; heart, gills and intestinal mass visible from below; tail musculature grey-brown; high-finned, fins transparent with dark stippling; tail tip pointed or rounded; vent tube dextral; spiracle sinistral, opening ventrolaterally; mouth terminal; oral disc surrounded by papillae except for anterior gap; labial tooth row formula 2(2)/3(1); max. length approx. 40 mm.
**Status & Distribution:** common, widespread in upland areas, north to about Gympie.

**Description:** small to medium sized (SVL up to 50 mm); both arboreal and terrestrial; beige and/or brown above; a broad, dark vertebral band (wholly or partly divided by a pale vertebral stripe) extends from the eyes, down the back to the vent; a dark lateral stripe extends from the nostril back, passing through the eye and tympanum, to the shoulder; a white stripe runs along the upper lip from just below the eye to the shoulder; underside off-white and (except for throat) coarsely granular; throat grey-brown to orange brown in breeding males; groin yellow or orange with black spots/splotches; anterior and posterior thigh yellow or orange without spots/splotches; tips of toes and fingers with small disc-like pads.

**Call:** a rapid, pulsing high-pitched ‘ree-ree-ree’; calls at night, the whole year round, more frequently during autumn and winter. Males call from vegetation and the ground, near water.

**Similar species:** closely resembles *Litoria revelata*. Lacks transverse row of tubercles between eyes seen in *L. revalata*; toe pads also less broad (see *L. revalata*). Also similar to *L. rubella* and *L. dentata*. Distinguished from these by spots/splotches in the groin (present in *L. verreauxii*, absent in *L. rubella* and *L. dentata*).

**Habitat:** found in a variety of habitats, usually associated with permanent water.

**Breeding:** breeds in streams and in ponds; mostly a winter-breeder in south-east Queensland; amplexus axillary; eggs jellied and pigmented; average clutch size 766 eggs.

**Larvae:** deep-bodied, ovoid with angular snout; tail twice as long as body; eyes laterodorsal; beige-brown above, darkest over braincase and intestinal mass; silver-gold below, intestinal mass obscured, heart and gills visible from below; high-finned; tail slender; tail musculature light brown, darkest anteriodorsally; fins translucent with dark stippling; tail tip pointed or rounded; spiracle sinistral, opening laterally; vent tube dextral; oral disc surrounded by papillae except for anterior gap; tooth row formula 2(2)/3(1); max. size 40 mm.
Breeding habitat and spawn of wet forest frogs

(A) Taudactylus pleione habitat (Kroombit Tops); (B) habitat of Mixophyes iteratus, Mixophyes fasciolatus, Litoria pearsoniana, Litoria chloris and Adelotus brevis (Conondale Range); (C) habitat of Taudactylus diurnus and Litoria pearsoniana (D'Aguilar Range); (D) Rheobatarchus silus habitat (Conondale Range).

(E) Mixophyes fleayi breeding habitat (Lamington Plateau); (F) habitat of Mixophyes iteratus and Mixophyes fasciolatus (Stanley River); (G) larvae of Kyarrmus loveridgei in muddy hollow (Lamington Plateau); (H) eggs of Mixophyes fasciolatus on undercut bank (D'Aguilar Range).
(I) breeding habitat of *Litoria revelata*, *Litoria verreauxii* and *Litoria chloris* (Lamington Plateau); (J) isolated stream-side pools in bedrock - breeding habitat of *Litoria chloris* and *Lechriodus fletcheri* (Lamington Plateau); (K) *Pseudophryne* eggs under fallen branch (Brisbane); (L) eggs of *Litoria chloris* in stream-side pool (Lamington Plateau).

**Glossary**

**Amplexus**: mating embrace
**Anterior**: towards front/snout
**Anteriadorsally**: anterior and uppermost
**Axillary amplexus**: mating embrace where male grabs hold of a female about the shoulders
**Dextral**: right-hand side
**Dorsum**: back (FIG. 1)
**Dorsal**: uppermost
**Dorsolateral**: uppermost, away from midline (i.e., out towards sides)
**Fusiform**: bullet-shaped
**Globose**: globular / spherical
**High-finned**: fins noticeably deeper than tail musculature
**Inguinal amplexus**: mating embrace where male grabs hold of a female about the waist
**Labial tooth row formula**: configuration of labial teeth on oral disc of tadpole (see FIG. 4)
**Lateral**: at the side(s) of
**Laterodorsal**: uppermost, at the sides
**Lateroventral**: on side of body, towards underside
**Low-finned**: fins no deeper than tail musculature
**Medial**: towards the midline
**Metatarsal tubercle**: tubercle at the base of heel (on underside of foot)
**Ovoid**: oval-shaped
**Papilla**: fleshy protuberance (plural = papillae)
**Papillary border**: papillae bordering oral disc in tadpoles (FIG. 4)
**Posterior**: towards rear
**Second finger**: see (FIG. 2)
**Sinistral**: left-hand side
**Spiracle**: exit tube for water passing out from gill chambers (FIG. 3)
**Subterminal**: not quite terminal. With reference to mouth: just back from front of snout
**SVL (Snout-vent length)**: the distance from the tip of the snout to the vent (measured when frog is held flat) (FIG. 1)
**Terminal**: at the very front or back. With reference to mouth: facing forward, out front of snout
**Tubercle**: small rounded protuberance of the skin
**Tympanum**: circular or oval membrane over ear opening, behind eyes (FIG. 1)
**Vent tube**: tube exiting gut at base of tail, which faecal matter and urine pass (FIG. 3)
**Ventral**: lowermost
**Ventrolateral**: on underside of body, away from midline
Figure 1. Side view of adult frog showing dorsum, SVL, tympanum, nares, canthus and lateral stripe.

Figure 2. (A) Underside of hand showing numbering system for fingers; (B) Underside of foot showing inner metatarsal tubercle and numbering system for toes.

Figure 3. Top view (A), side (B) and underside (C) of tadpole with hindlegs.

Figure 4. Oral disc of tadpole showing labial teeth, keratinized beak and papillae. Labial tooth row formula $2(2)/3(1)$ = two upper rows, second row broken; three lower tooth rows, the first broken. Numbers in brackets indicate broken tooth rows.
### Checklist of Frogs of south-east Queensland

DW = dry woodland; DF = dry forest; WF = wet forest; W = wallum; G = grassland; P = isolated ponds and/or swamps; S = stream; T= terrestrial environs.

### MYOBATRACHIDAE

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Primary habitat</th>
<th>Reproductive habitat</th>
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<td>P/S</td>
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### BUFONIDAE

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**HYLIDAE**

### Tree Frogs and related forms

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<td>Broad-palmed Rocketfrog</td>
<td>DW/DF</td>
<td>P</td>
</tr>
<tr>
<td>Litoria lesueurii</td>
<td>Stony-creek Frog</td>
<td>WF/DF</td>
<td>S</td>
</tr>
<tr>
<td>Litoria nasuta</td>
<td>Striped Rocketfrog</td>
<td>DW/G</td>
<td>P</td>
</tr>
<tr>
<td>Litoria olongburensis</td>
<td>Wallum Sedgefrog</td>
<td>W</td>
<td>P</td>
</tr>
<tr>
<td>Litoria pearsoniana</td>
<td>Cascade Treefrog</td>
<td>WF</td>
<td>S</td>
</tr>
<tr>
<td>Litoria peronii</td>
<td>Emerald-spotted Treefrog</td>
<td>DF/DW</td>
<td>P</td>
</tr>
<tr>
<td>Litoria revelata</td>
<td>Whirring Treefrog</td>
<td>WF</td>
<td>P/S</td>
</tr>
<tr>
<td>Litoria rubella</td>
<td>Naked Treefrog</td>
<td>DF/DW</td>
<td>P</td>
</tr>
<tr>
<td>Litoria rothii</td>
<td>Northern Laughing Treefrog</td>
<td>DF/DW</td>
<td>P</td>
</tr>
<tr>
<td>Litoria subglandulosa</td>
<td>New England Treefrog</td>
<td>DF/DW</td>
<td>S</td>
</tr>
<tr>
<td>Litoria tyleri</td>
<td>Laughing Treefrog</td>
<td>DF/DW</td>
<td>P</td>
</tr>
<tr>
<td>Litoria verreauxii</td>
<td>Whistling Treefrog</td>
<td>WF/DF</td>
<td>P/S</td>
</tr>
</tbody>
</table>
HOW YOU CAN HELP

If you find an endangered frog forward the following information to Harry Hines, Ed Meyer or Jean-Marc Hero (see below for contact details):

1. The species encountered;
2. A detailed description, including size, the colour and texture of the back, belly and sides, the colour of the eyes, the shape and orientation of the pupil when constricted, the extent of webbing between the toes, presence/absence of distinct toe pads, the colouration of the thighs and groin;
3. The exact locality, date and time of day the frog was found;
4. Whether or not you photographed the frog and/or recorded its call;
5. Your contact details.

Any frog records you make are important to our understanding of their distribution and conservation status. Consider contributing your records to Nature Search – contact your nearest Queensland Parks & Wildlife Service office for information or ring 3202 0200.

For further information contact:

Harry Hines
Queensland Parks & Wildlife Service
PO Box 42 Kenmore, Qld 4069

Ed Meyer
Department of Zoology & Entomology
University of Queensland
St Lucia Qld 4067

Dr Jean-Marc Hero
School of Environmental & Applied Sciences
Griffith University, Gold Coast Campus
PMB 50, Gold Coast Mail Centre Qld 4217

NOTE:
IT IS ILLEGAL TO COLLECT FROGS WITHOUT A PERMIT.

References