

## Catalogue of American Amphibians and Reptiles.

ALTIG, RONALD, AND PHILIP C. DUMAS. 1972. *Rana aurora*.*Rana aurora* Baird and Girard  
Red-legged frog*Rana aurora* Baird and Girard, 1852:174. Type-locality, "Puget Sound," Washington. Syntypes (4), U. S. Natl. Mus. 11711 (Cochran, 1961); collection date and collector unknown.

- CONTENT. Two subspecies are recognized, *aurora* and *draytoni*.

- DIAGNOSIS. Typically reddish to olive or gray dorsally, *R. aurora* has dark dorsal spots with indefinite borders and often with light centers. Interspot flecking is well developed. At least part of the venter and the hidden parts of the hind legs are red, and an underlying layer of yellow pigment typically is visible. A darker gray pattern may be present on the venter, and the groin is boldly mottled with black and yellow-green. Only *R. pretiosa* ever has red on the venter, and it can be distinguished from *aurora* by having shorter legs, upturned eyes, and an unmottled groin.

- DESCRIPTIONS. A moderate-sized frog (males to 100 mm snout-vent length, females 136 mm), *R. aurora* has smooth to moderately rugose dorsal skin. Brownish dorsolateral folds, sometimes indistinct, extend from the eye to near the groin, a light lip line extends from the eye to near the shoulder, and a dark mask covers the side of the head from the nostril to the jaw angle. A post-tympanic ridge projects from the eye to the shoulder; the eyes do not appear upturned and are fully covered by the eyelids dorsally. The reddish ventral color varies geographically and ontogenetically and may be absent in small individuals. The limbs are banded with black and the ground color of the limbs may contrast with that of the body. The adpressed heel typically reaches to or beyond the nostril.

Baird and Girard (1852), Cope (1886), Dickerson (1906), Boulenger (1919, 1920), Storer (1925), Wright and Wright (1949), Gordon (1939), Stebbins (1951, 1954a, 1966), Dunlap (1955) and Dumas (1966) described adult frogs. Wright and Wright (1949), Stebbins (1951, 1966), and Altig (1970) presented partial descriptions of the tadpole, and Livezey and Wright (1947) and Wright and Wright (1949) described the egg.

- ILLUSTRATIONS. See Dickerson (1906), Storer (1925), Pickwell (1947), Wright and Wright (1949), and Cochran and Goin (1970) for black and white photographs of adults. Stebbins (1951, 1954a, 1966) presented line drawings of adults plus diagnostic figures in a key. Girard (1858), Stebbins (1959, 1966, 1972) and Dickerson (1906) presented color paintings of adult *draytoni*. Livezey and Wright (1947) and Wright and Wright (1949) figured the egg and Stebbins (1951, 1966) illustrated the tadpole and mouthparts. Storer (1925) presented a photograph of an egg mass.

- DISTRIBUTION. Excluding the Central Valley and deserts of California, the species ranges from the Cascade-Sierra crest westward from southwestern British Columbia and Vancouver

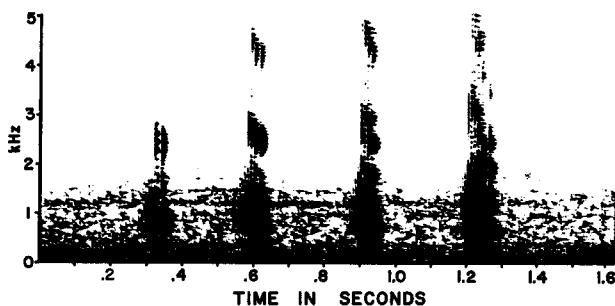
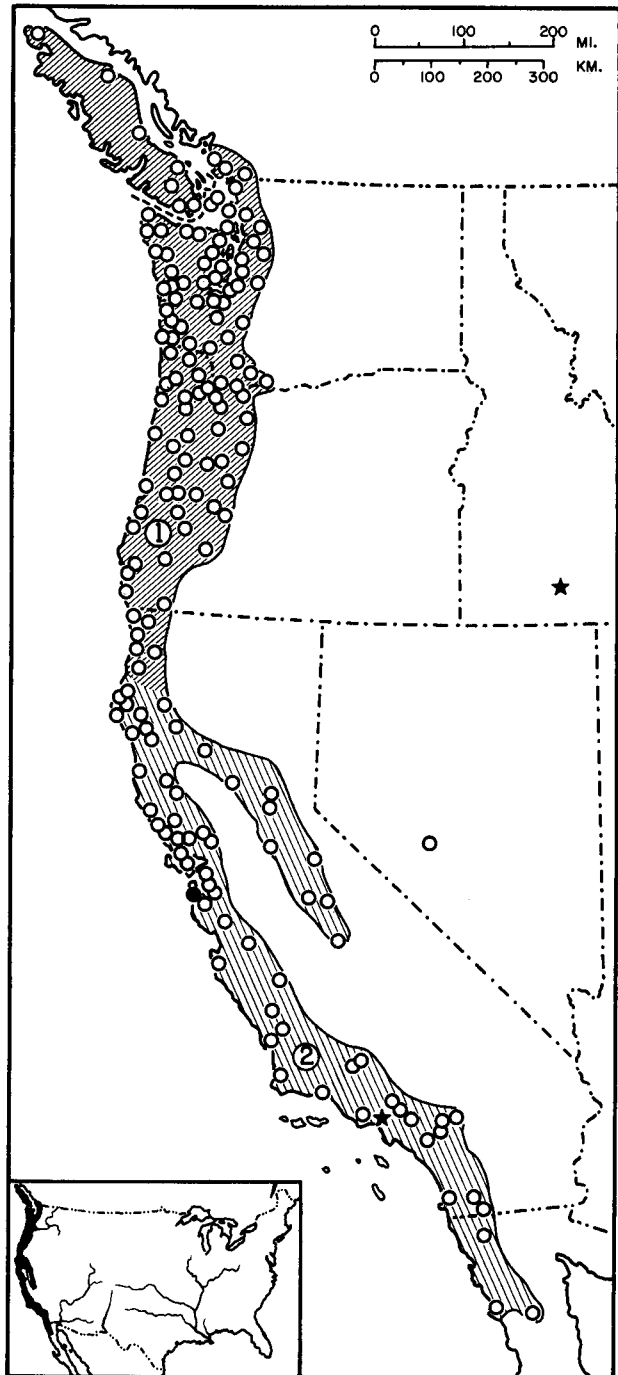


FIGURE. Audiospectrogram (narrow band, 45 Hz) of mating call of *Rana aurora*: Little Campbell River, 5 miles east of White Rock, British Columbia; frog calling under water at 9°C (audiospectrogram courtesy of Lawrence E. Licht).

island to about the Santo Domingo River in northwestern Baja California, Mexico. It has been introduced at Millett, Nye County, Nevada (Linsdale, 1940). Stebbins (1951, 1954a, 1966) presented complete range maps and Dumas (1966) mapped the northern sector. Girard (1858), Van Denburgh (1912), Grinnell and Camp (1917), Schmidt (1922), Grinnell and Storer (1924), Bogert (1930), Grinnell, Dixon and Linsdale (1930), Myers (1930), Klauber (1932), Logier (1932), Linsdale (1932, 1940), Fitch (1936), Jewett (1936), Gordon (1939), Wood (1939), Carl (1942), Hill (1948), Hardy (1948), Stebbins (1954b), Murray (1955), Slater (1955, 1964, 1965), Dunlap



MAP. Solid circle marks type-locality of *Rana aurora draytoni*; type-locality of *R. a. aurora* is too indefinite to be plotted. Stars indicate Pleistocene (southern California) and Pliocene (Idaho) fossil localities. Circle in Nevada marks an introduced population.

(1959), Logier and Toner (1961), Sloan (1964), Snyder (1965), Banta and Morafka (1967), Bury, Fellers, and Ruth (1969), Glaser (1970) and Morafka and Banta (1972) presented distributional information. Bury (1970) identified frogs from Trinity and Siskiyou counties, California, as this species, but subsequently (1973) reidentified them as *Rana cascadae*.

• **FOSSIL RECORD.** Brattstrom (1953) recorded a radioulna and a vertebra from the Rancho LaBrea tarpits (late Pleistocene), Los Angeles County, California. Chantell (1970) referred Upper Pliocene material from the Glenns Ferry Formation in Twin Falls, Owyhee, and Elmore counties, Idaho, to *Rana*, cf. *Rana aurora*.

• **PERTINENT LITERATURE.** Zweifel (1955) and Porter (1961) discussed artificial hybridization with *R. cascadae*. Haertel et al. (1974) discussed karyological data, and Zweifel (1954), Chantell (1968, 1970), and Altig (MS) presented osteological data. Calef (1973a), Storm (1960) and Storm and Pimentel (1954) discussed breeding biology, and Licht (1969a, 1969b, 1970) discussed breeding behavior and (1969c) egg palatability. Storm (1952) described mismating with *Rana catesbeiana*, and Weins (1970) discussed tadpole behavior. Peabody and Savage (1958) and Savage (1960) included the species in zoogeographical analyses, Hensley (1959) listed albinos, and Brattstrom (1963) discussed thermal ecology. Triplett (1958) discussed embryology of the nervous system. Welsh and Zipf (1966) discussed skin chemistry, Adams and Finnegan (1965) studied enzyme activity during early development, and Chew (1961) studied water metabolism. Cowan (1941) reported longevity. Lehmann (1965) listed parasites and Zweifel (1955) discussed ecology in relation to that of the *Rana boylei* group. Dickman (1968) observed the effect of tadpoles on periphyton communities, and Calef (1973b) studied tadpole mortality. Fitch (1941) recorded predation by *Thamnophis ordinoides* and by *T. sirtalis* on *R. aurora*. Hays (1955) recorded feeding activity and Cunningham (1955) mentioned abnormal individuals. Camp (1917) discussed systematic status and Storer (1925) and Slevin (1928) discussed ecology. Klauber (1934) presented brief natural history notes. Wallace et al. (1973) examined electrophoretic patterns. Dunlap (1955) compared *R. aurora* with other species of *Rana* in Oregon.

• **NOMENCLATURE HISTORY.** Baird and Girard (1852) described *aurora* and *draytoni* as species. Camp (1917) established the current arrangement by placing *draytoni* as a subspecies of *aurora*. Baird and Girard (1853), Hallowell (1854, 1859), Yarrow and Henshaw (1878), Yarrow (1882) and Cope (1889) formed synonyms of *R. a. draytoni* either by new combinations or by descriptions of new forms.

• **ETYMOLOGY.** The specific name *aurora* is the Latin word meaning "dawn," and undoubtedly was given in reference to the red color of the underside of the hind legs. The patronym honors Joseph Drayton, artist on the U. S. Exploring Expedition and collector of the type series.

## 1. *Rana aurora aurora* Baird and Girard Northern Red-legged Frog

*Rana aurora* Baird and Girard, 1852:174. See species account.  
*Rana agilis aurora*: Cope, 1889:439. New combination.  
*Rana aurora aurora*: Camp, 1917:123. First use of trinomial.

• **DEFINITION.** This race is smaller than *draytoni* (to 75 mm snout-vent length) and has fewer spots and smooth skin. The dorsolateral and post-tympanic folds are not prominent. The limbs are shorter and the eyes are smaller than in *draytoni*.

## 2. *Rana aurora draytoni* Baird and Girard California Red-legged Frog

*Rana draytonii* Baird and Girard, 1852:174. Type-locality, "San Francisco, California, and on Columbia River," restricted to "vicinity of San Francisco" by Schmidt (1953:85). Syntypes (6), U. S. Natl. Mus. 11497, collected by Joseph Drayton in 1841 (Cochran, 1961).

*Rana leconteii* Baird and Girard, 1853:301. Type-locality, "San Francisco," San Francisco County, California. Syntypes (2), U. S. Natl. Mus. 3362, collected by J. L. LeConte in February 1850 (Cochran, 1961).

*Rana nigricans* Hallowell, 1854:96. Type-locality, "El Paso Creek, Kern County, California." Syntypes, U. S. Natl.

Mus. 3366, 3376, collected by A. L. Heermann (Cochran, 1961).

*Rana longipes* Hallowell, 1859:20. Type-locality, "El Paso Creek, Kern County, California." Same cotypes as *Rana nigricans* (Cochran, 1961).

*Rana temporaria aurora*: Yarrow and Henshaw, 1878:209. New combination.

*Epirhexis longipes*: Yarrow, 1882:176. New combination.

*Rana draytoni draytoni*: Cope, 1889:441. New combination.

*Rana aurora draytonii*: Camp, 1917:123. First use of this trinomial.

• **DEFINITION.** This race is larger than *aurora* (to 136 mm snout-vent length) and has more spots and a rugose dorsal skin. The dorsolateral and post-tympanic folds are prominent. The legs are longer and the eyes are larger than in *aurora*.

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