

Catalogue of American Amphibians and Reptiles.

TURNER, FREDERICK B., AND PHILIP C. DUMAS. 1972. *Rana pretiosa*.

***Rana pretiosa* Baird and Girard
Spotted frog**

Rana pretiosa Baird and Girard, 1853:378. Type-locality, "... in Oregon ... on Puget Sound [Washington]." Syn-types (5), U. S. Natl. Mus. 11409.

Rana temporaria pretiosa: Cope, 1889:432. New combination. *Rana pretiosa luteiventris* Thompson, 1913:53. Type-locality, "Anne Creek, Elko Co., Nevada." Holotype, Univ. Michigan Mus. Zool. 43037, collected on 16 July 1912 by Crystal Thompson.

Rana pretiosa pretiosa: Stejneger and Barbour, 1917:38. First use of trinomial.

Rana pretiosus: Cary, 1917:33. Unjustified emendation.

- CONTENT. No subspecies currently are recognized.

- DEFINITION AND DIAGNOSIS. Characteristics include distinct dorsolateral folds along the full length of the back, a high eye angle, relatively short hind legs, and red, orange or yellow ventral coloration of mature individuals. Adult snout-urostyle length varies geographically (males to 68 mm, females to 90–100 mm—Washington and Oregon; males to 60 mm, females to 75 mm—Wyoming; males to 60 mm, females to 70 mm—Nevada). Shorter hind legs (heel of appressed hind leg does not reach nostril), high eye angle and usually gray groin mottling distinguish *R. pretiosa* from *R. aurora*. Where *R. pretiosa* and *R. cascadae* are sympatric, *pretiosa* is larger and is red ventrally (yellow in *cascadae*). *R. cascadae* also differs in its lower eye angle. For additional information, see Stebbins (1954), Dunlap (1955) and Dumas (1966).

- DESCRIPTIONS. For useful descriptions of adults, see Cope (1889), Boulenger (1920), Wright and Wright (1949), Stebbins (1951) and Dumas (1966). Dunlap (1955) and Turner (1959a) presented some skeletal ratios. Turner (1959b) analyzed skin pigmentation of Wyoming specimens and Dumas (1966) did the same for frogs from Washington, Oregon and Idaho. The larval labial tooth row formula typically is $\frac{2}{3}$, but varies ontogenetically and geographically from $\frac{1}{2}$ to $\frac{3}{8}$. For descriptions of larvae, see Thompson (1913), Logier (1932), Svihla (1935), Wright and Wright (1949), Turner (1958a), Morris and Tanner (1969) and Altig (1970).

- ILLUSTRATIONS. For black-and-white photographs, see Dickerson (1906), Wright and Wright (1949), Dunlap (1955), Slevin (1928), and Cochran and Goin (1970). Dickerson (1906) and Girard (1858) have colored illustrations. Black-and-white drawings are in Stebbins (1951, 1954 and 1966) and Turner (1955). Drawings of external details of adults are in Girard (1858), Cope (1889), Camp (1917) and Thompson (1913), and Thompson (1913) and Svihla (1935) illustrated larval mouth parts. Egg masses or individual eggs are illustrated in Livezey and Wright (1945, 1947), Wright and Wright (1949), and Morris and Tanner (1969).

- DISTRIBUTION. *Rana pretiosa* ranges from Sergrief Island, southeastern Alaska, Telegraph Creek (Nat. Mus. Canada

6526) and Chetwynd (Nat. Mus. Canada 8685), British Columbia, south to northeastern California (Univ. California Mus. Vert. Zool. 2098, 2099), central Nevada (Turner, 1962a) and central Utah (Tanner, 1940). It ranges from sea-level on the coast of Washington east to the Rocky Mountains in Alberta, Montana and to 2590 m in western Wyoming, but is absent from the higher parts of the Olympic and Cascade ranges of Washington and Oregon. The range is discontinuous along much of its southern and western edge. A record for *R. pretiosa* from Arizona (Tanner, 1940) is questionable. Logier and Toner (1961) reported this species from Saskatchewan, but Cook (1964) thinks it does not occur east of western Alberta. The distributions of *R. pretiosa* in the western part of its range and *R. aurora* are largely complementary, though they coexist at some localities (Stebbins, 1951). For additional distributional information, see the following: *British Columbia*, Carl (1943), Carl and Hardy (1943), Carl and Cowan (1945), Ferguson (1956), Logier (1932), Patch (1922), Stanwell-Fletcher and Stanwell-Fletcher (1943); *Alberta*, Moore and Strickland (1955), Patch (1929); *Idaho*, Fichter and Linder (1964), Slater (1941), Van Denburgh and Slevin (1921), Waitz (1961); *Washington*, Slater (1955, 1964); *Oregon*, Dunlap (1955, 1959), Evenden (1943), Ferguson (1952, 1954), Ferguson, Payne and Storm (1958), Gordon (1939), Jewett (1936); *Nevada*, Banta (1965), Linsdale (1940), Ruthven and Gaige (1915); *Utah*, Tanner (1931), Van Denburgh and Slevin (1915); *Wyoming*, Turner (1955); *Montana*, Brunson and Demaree (1951), Manville (1957), Black (1970).

- FOSSIL RECORD. None.

- PERTINENT LITERATURE. Wright and Wright (1949) and

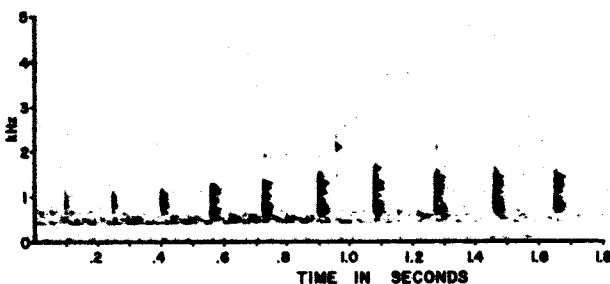
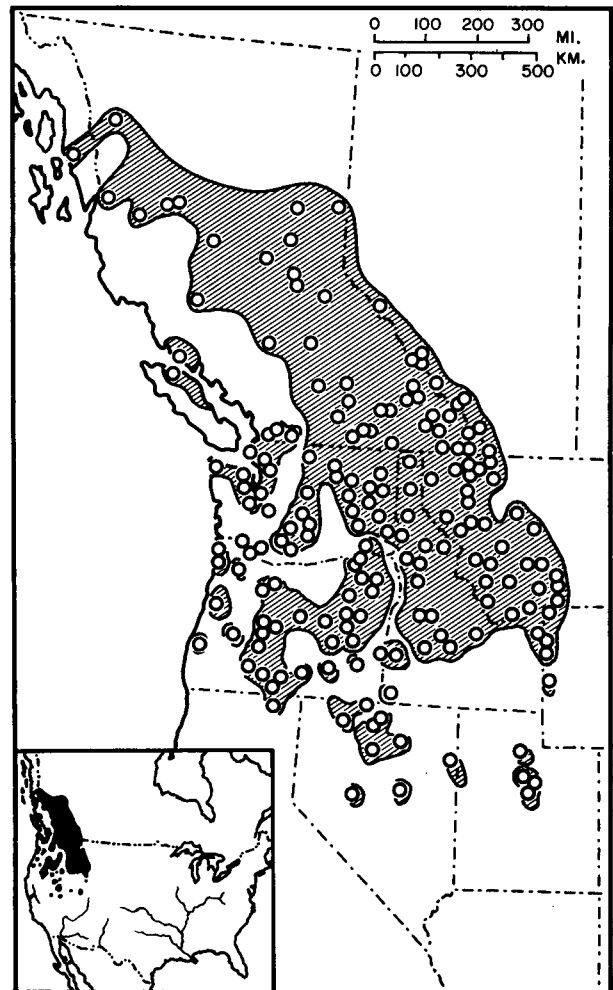


FIGURE. Audiospectrogram (narrow band, 45 Hz) of mating call of *Rana pretiosa*: Lower Campbell River, British Columbia, 13 March 1969, water 12.4°C. (courtesy Lawrence E. Licht).



MAP. Circles mark known localities; shaded area estimates total range. Type-locality is too imprecise to plot.

Stebbins (1951) described the habitat of *R. pretiosa*, which is a highly aquatic form but may move overland during spring and late summer (Turner, 1960a). For other general comments on life history, see Middendorf (1957), Turner (1958a) and Morris and Tanner (1969). Tanner (1931), Schonberger (1945), Moore and Strickland (1955) and Turner (1959c) presented data on food habits. Burke (1933) showed that tadpoles of *R. pretiosa* can subsist on bacteria, Morris and Tanner (1969) described growth of larvae, and Turner (1960a, 1960b) detailed growth of metamorphosed individuals. Turner (1960a, 1960c, 1962b) reported aspects of population ecology, Carpenter (1954) and Turner (1960a) gave data on movements, and Carpenter (1953) described aggregating behavior of tadpoles. Information on the call of the male was given by Svihla (1935), Turner (1958a), Morris and Tanner (1969) and Licht (1969, 1971), who also described other aspects of breeding behavior. The report of Svihla (1935) that the call is audible to human beings at a distance of one-quarter mile is not supported by other investigators. Parasites were studied by Lucker (1931), Olsen (1937a, 1937b, 1938), Schonberger (1945), Turner (1958b) and Waitz (1961). The last author also reported supposed hybrids between *R. pretiosa* and *R. sylvatica*, but Dumas (1966) showed experimentally that the two species are incapable of producing viable embryos. Dumas (1966) used experimental crosses, studies of water balance and biochemical tests to analyze the systematic relationships of *R. pretiosa* to *R. aurora*, *R. sylvatica* and *R. cascadae*. Haertel and Storm (1970) showed that success in hybridizing *pretiosa* and *cascadae* depended on *pretiosa* being the female parent. Brattstrom (1968) reported thermal acclimation, and Licht (1971) reported embryonic thermal adaptation. Hebard (1964) studied serum-protein electrophoretic patterns. Chantell (1970) made osteological comparisons among several species of *Rana* and concluded that *R. pretiosa* belonged to a well-defined group that included *R. sylvatica* and the western species *R. aurora*, *R. boylii*, *R. cascadae* and *R. muscosa*. Dumas (1964) experimentally evaluated ecological segregation of *R. pretiosa* and *R. pipiens* observed by himself and other authors (Thompson, 1913; Turner, 1962a).

• **NOMENCLATURE HISTORY.** *Rana pretiosa* has been recognized as a valid species by most authors since its description; only Meek and Elliot (1899) followed Cope (1889) in placing *pretiosa* as a subspecies of the European *Rana temporaria*. Cope (1872) recorded *pretiosa* from Montana, but in the same paper identified specimens from other localities in Montana and Wyoming as a northeastern species, *Rana septentrionalis*, and other authors (Yarrow, 1875, 1883; Skinner, "1924" [1926]) repeated the error.

The similarity of the *Rana* of the Pacific Coast to one another led to many mis-identifications of other species as *R. pretiosa*. Zweifel (1968) noted confusion of *R. muscosa* with *R. pretiosa* by Yarrow and Henshaw (1878), Cope (1889) and Stejneger (1893), and at least two western species were misidentified by Yarrow (1883) as *pretiosa*. Slater (1964) corrected his earlier (1955) errors of identification. Grinnell and Camp (1917), Grinnell, Dixon and Linsdale (1930), Storer (1925) and Slevin (1928) all confused *R. cascadae* in northern California with *R. pretiosa* (Stebbins, 1951).

• **ETYMOLOGY.** The specific name derives from the Latin *pretiosus*, of great value, and perhaps, by extension, attractive or pretty. The name may refer to the vivid underparts of the adult.

COMMENT

Thompson (1913) described *Rana pretiosa luteiventris* on the basis of orange or orange-yellow ventral coloration (as opposed to red), the lack of a metatarsal tubercle at the base of the fourth toe, and only one distinct palmar tubercle. In general, authors dealing with local populations of *pretiosa* have tended to use trinomials, whereas those viewing the species over a wider range have not. Van Denburgh and Slevin (1915) found the characters to be inconsistent, and Slevin (1928) did not recognize the subspecies. Storer (1925) and Stebbins (1951) questioned the validity of the subspecies, and Stebbins (1954, 1966) did not recognize *luteiventris*. We agree with the last interpretation.

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surveys of the territory of the United States west of the 100th meridian . . . Appendix L.

Zweifel, Richard G. 1968. *Rana muscosa*. Cat. Amer. Amphib. Rept: 65.1-65.2.

F. B. TURNER, LABORATORY OF NUCLEAR MEDICINE AND RADIATION BIOLOGY, UNIV. CALIFORNIA, LOS ANGELES, CALIFORNIA 90024, AND P. C. DUMAS, CENTRAL WASHINGTON STATE COLLEGE, ELLENSBURG, WASHINGTON 98926.

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Primary Editor for this account, Richard G. Zweifel.