

**SCIENTIFIC AND STANDARD ENGLISH NAMES OF  
AMPHIBIANS AND REPTILES OF NORTH AMERICA  
NORTH OF MEXICO, WITH COMMENTS REGARDING  
CONFIDENCE IN OUR UNDERSTANDING**

**SEVENTH EDITION**

**COMMITTEE ON STANDARD ENGLISH AND SCIENTIFIC NAMES**

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Official Names List

of

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## INTRODUCTION

The seventh edition of the scientific and standard English names list for North American amphibians and reptiles north of Mexico is also a special publication for the seventh World Congress of Herpetology and we are delighted to share it with the global herpetological community. The seventh edition is an update of the sixth edition published in 2008, with new scientific and English names as well as annotations explaining those changes. An online version can be found at [http://www.ssarherps.org/pages/comm\\_names/Index.php](http://www.ssarherps.org/pages/comm_names/Index.php).

Because of the expanded readership of this edition, we present a brief history of names lists for the North American (north of Mexico) herpetofauna. The history begins with Cope's *Checklist of North American Batrachia and Reptilia* (1875). Cope's effort focused on adopting certain rules of nomenclature because they "offer the only means by which writings of authors in the sciences concerned can be intelligible." While Cope's checklist only presented scientific names, Yarrow (1882) produced a new checklist that included both scientific and common or vernacular names. As far as we know, Yarrow (1882) made the first formal attempt to provide both vernacular names and scientific names for the North American herpetofauna. Yarrow (1882: 4) noted that developing vernacular names was a challenging proposition:

"Considerable difficulty has been experienced in furnishing English names for many species of reptiles, particularly as the same reptiles may be known by local names in different parts of the country; and to this task was added the very laborious one of translating as literally as possible some of the polysyllabic Greek and Latin names."

Stejneger and Barbour followed Yarrow, publishing five editions of *A Check List of North American Amphibians and Reptiles* (1917, 1923, 1933, 1939, 1943), and like Yarrow they found vernacular names difficult to handle. In the first edition (1917: iii), Barbour wrote:

"Common names for reptiles and amphibians are in great confusion, and are often of generic rather than of specific application. No attempt is made to recognize any except those which are in well established usage. The host which have been recently coined by various writers are frequently inapt and almost surely unlikely to survive."

So Stejneger and Barbour took a step back from Yarrow's vernacular names and used very few in the five editions of their checklist. In fact, Stejneger and Barbour never commented again on vernacular names in the introductions of the later editions. By the fifth edition (1943: v), a new issue became the object of their attention and ire.

"Reviewing genera has lately become a fashion and when carefully and competently done is a good fashion. Many of the modern revisionists have become infected with the nazi formenkreis or rassenkreis idea, and that may not be such a bad fashion either if the search for true relationship and affinity is carried out in its legitimate field which is phylogeny and not taxonomy.

Speculating about phylogeny of an aggregation of so-called species and subspecies is an interesting occupation and has often been of great profit to the taxonomist. But when the phylogenists [sic] begin to play with the nomenclature and want to express their (often very tenuous, sometimes fantastic) ideas in names, then goodbye to stability of nomenclature which we have been sweating for all these years....”

“A check-list should not be made the means of *propaganda* [emphasis theirs] for anybody’s phylogenetic imaginations. Its object is to give users a key to the normal taxonomic status of the named forms and their geographic distribution. And for this purpose a name is a name and its main function is to give a handle to the form (species, subspecies, race) we are talking about.”

The latter passage was from an anonymous letter to Barbour (i.e. Barbour did not give the name of the author), which he quoted to express his own opinion on the matter of phylogeny affecting nomenclatural changes. The issue continues to resonate with regard to names and the function of such lists (e.g. see Crother, 2009; Frost et al., 2009; Pauly et al. 2009).

The next version of *A Check List of North American Amphibians and Reptiles* was completed by Schmidt (1953) and was the first to be sponsored by a scientific society, the American Society of Ichthyologists and Herpetologists (ASIH). Schmidt composed a grand volume and revived the inclusion of common names for all species and subspecies. According to Schmidt in his preface, his volume was born out of frustration over failed “committee machinery.” At the time of the publication of Schmidt’s list (1953), a new committee was appointed by the ASIH president and it produced a list three years later (Conant et al., 1956). The list by Conant et al. was quite different from that of Schmidt (1953). Schmidt’s checklist was 280 pages while that of Conant et al. was only 13. Whereas Schmidt’s check list included (for species) the scientific name, its author, a citation of the original description (and synonyms and nomenclatural changes when relevant), a summary of the geographic distribution, and the common name, the list by Conant et al. was presented explicitly as a list of common names and was therefore stripped down to only the scientific names and the corresponding common names. It should be noted that Conant et al. (1956: 172) presented their list as standard common names

“...suitable for use by zoo and museum personnel, other writers of labels, guide books, and popular handbooks, camp counselors, biology teachers, professional zoologists whose chief interest is not herpetology, and anyone else who could make profitable use of such a standard list of names.”

The Society for the Study of Amphibians and Reptiles (SSAR) took over the task of producing the list (Collins et al., 1978) and like its predecessor (Conant et al. 1956), the first SSAR list contained only scientific and common names. Collins et al. (1978) is the first list in which common names are called “standard common names.” A subtle change in the name formation occurred in the 1978 list, where names that were adjectives, such as “black-headed snake”, became nouns as in “blackhead snake.” This change in language was retained

over the first four editions published by SSAR. The second SSAR edition (Collins et al., 1982) added the authors of the genus names and the third edition (Collins, 1990) included the name's author and the year of the description for all taxa. The fourth edition (Collins, 1997) followed the format of the third. A significant philosophical change occurred between the list by Conant et al. (1956) and those by Collins with regard to the usage of common names. Whereas Conant et al. downplayed the usage of common names, the Collins' lists all strongly urged people to use the standardized common names.

The fifth edition of the SSAR list (Crother et al., 2000) revived the committee format, with specialist subcommittees for each major group. The fifth edition included an expanded set of rules for common names and most significantly added referenced annotations to explain taxonomic changes and English names. In addition to these changes, we began to use a novel protocol to differentiate dates of appearance of a species name from dates of publication. For example, for *Gastrophryne olivacea* the dates given were 1857 "1856." The quotation marks indicated that the date printed on the publication was 1856, but the publication actually appeared in 1857. An update of the fifth edition was published in 2003 (Crother et al., 2003) and the sixth edition (Crother, 2008; a note on this citation, the committee decided to treat the volume as edited and thus the absence of "et al.") continued with the same format. The first web edition came online in 2011 and is considered a modification of the sixth edition. As updates occur to the online edition, the edition number will change from 6.0 to 6.1, 6.2, etc., until the 7<sup>th</sup> edition, then the online updated editions will change from 7.0 to 7.1, etc. One other change incorporated since the SSAR fifth edition was a move away from calling the relevant names "common names." Instead, for North America north of Mexico the names are called English names to acknowledge that common names exist in various languages. Thus, in a recent list on names of Mexican amphibians and reptiles (Liner and Casas-Andreu, 2008), both standard English and Spanish names were given. A companion Herp Circular with standard French names (Green, 2012) was published simultaneously using the scientific names in this edition. Like the SSAR editions one through four, we also encourage workers to use these standard names for members of the North American herpetofauna.

It has been the hope that providing standardized names would create consistency in usage across professions, from zoos and museums and field guides, to government agencies and scholarly publications. Towards this end, a number of societies have sanctioned the recent lists. The fifth and sixth editions were published by SSAR, but these lists were also sanctioned by the Herpetologists' League (HL) and the American Society of Ichthyologists and Herpetologists (ASIH). The seventh edition list is sanctioned by the aforementioned three societies as well as the Canadian Association of Herpetologists, Canadian Amphibian and Reptile Conservation Network, and Partners in Amphibian and Reptile Conservation. With such broad support from the scientific and conservation community in North America it is hoped that greater consistency of name usage will be achieved.

Because the data are available from the various names lists, it seemed like an interesting exercise to compare species numbers across time. The table below compares numbers of species recognized by Yarrow (1882), Collins et al. (1978) and Crother (this list). The patterns are intriguing and no doubt reflect the opposing forces of simple lumping and splitting practices as well as the recognition of geographic variation causing synonymy of names and the introduction of molecular data that revealed hidden lineages. In some cases there has been a decrease in numbers of species since Yarrow's (1882) list, as in snakes, while in others there have been large increases in numbers, as in salamanders and frogs.

	1882	1978	2012
Crocodylians	2	2	2
Turtles	49	48	59
Lizards	105	93	120
Snakes	181	120	155
Salamanders	63	111	194
Frogs	65	80	102
TOTALS	465	454	632

Beginning with Schmidt (1953), numbers of introduced, or alien species have been tallied for North America. Remarkably, but perhaps not surprisingly to some, the number of known alien species in North America has increased by seven times since the 1953 list and more than doubled in just over 20 years (from the 1990 list). The breakdown of the numbers by traditional orders (which are not all monophyletic) is given below. The problem is significant and probably global and has become an entire area of herpetological research.

	1953	1990	2012
Crocodylians	0	1	1
Turtles	0	0	2
Lizards	7	23	58
Snakes	0	1	5
Salamanders	0	0	0
Frogs	3	4	6
TOTALS	10	29	72



Citations of this list have varied greatly in format. To achieve uniformity the committee agreed on the following format in which the authors of a subsection are cited as the authors of a publication within the list as a whole. For example,

de Quieroz, K. and T. W. Reeder. 2012. Squamata – Lizards. *IN* B. I. Crother (ed.), Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, With Comments Regarding Confidence In Our Understanding pp. 32–51. SSAR Herpetological Circular 39:1-92.

If the entire list is cited, it is treated as an edited volume using the following format:

Crother, B. I. (ed.). 2012. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, With Comments Regarding Confidence In Our Understanding. SSAR Herpetological Circular 39:1-92.

The task of compiling the information that goes into these publications is not trivial. We encourage readers to please send us your reprints concerning any taxonomic changes or decisions that your work may dictate or which may be relevant to this list. Receiving your reprints will help ensure that future versions of the list are as complete and up-to-date as possible.

Forming Standard English Names: Some Guidelines for Reptiles and Amphibians

## RULES

### Capitalization.

Standard English names of species should be capitalized to distinguish them from descriptions and generalized usage. For example, “I collected a Green Frog (*Lithobates clamitans*)” versus “I saw a green frog.” When group names (i.e. standard English names for genera and higher categories or as a word or words that applies to one or more species) are used alone (i.e., not as part of the English name of a species) they should not be capitalized. For example, “The Western Diamond-backed Rattlesnake is a well known species of rattlesnake.” Or, “I hear that racerunners are difficult to catch.”

### Formation of descriptive or modifying word.

1. When a descriptor refers to a feature of an animal, the suffix -ed will be added. The modifying word will be treated as an adjective as opposed to a noun in apposition.

Examples: Black-headed Snake, Red-eared Slider, Long-tailed Salamander.

2. Hyphenation. The standard grammatical rule for joining two or more words

serving as a single adjective before a noun will be followed. The rule states that a hyphen is more appropriately used to join the words in lieu of combining the words.

Examples: Black-masked Racer, not Blackmasked Racer; Black-headed Snake, not Blackheaded Snake; Long-tailed Salamander, not Longtailed Salamander.

Exception: When one of the words describes a location, geographic region, or direction, a hyphen is not used.

Examples: Blue Ridge Two-lined Salamander, Southern Red-backed Salamander, Florida Red-bellied Turtle.

### Formation and Use of Group Names.

1. Compound names should be spelled as a single word, unhyphenated, if:

A. The second component is from among the words frog, toad, snake, turtle, tortoise, lizard, salamander, newt, siren.

Examples: Ratsnake, Coralsnake, Treefrog

B. The second component refers to a part of the body.

Examples: Cottonmouth, Copperhead, Whiptail, Softshell, Spadefoot

C. The name describes an activity of the animal.

Examples: Racerunner, Pondslider, Bloodsucker

D. The second component is a misnomer.

Examples: Waterdog, Hellbender, Mudpuppy, Coachwhip

Exceptions: Names that would ordinarily be spelled as single unhyphenated words under the above rules should be spelled as separate words with both capitalized when:

A. Spelling as a single word would result in an awkward double or triple letter series.

Example: Wall Lizard, not Walllizard

B. A single word would be excessively long (over three syllables), or awkward, or imply an incorrect pronunciation.

Examples: Tiger Salamander, not Tigersalamander (any combination with salamander can be ruled as too long); Earless Lizard, not Earlesslizard

2. Compound names that are not spelled as a single word should have each word capitalized.

Examples: Box Turtle, Rosy Boa, Cricket Frog

3. A group name may be applied to two or more distantly related groups.

4. Group names of more than one word should neither be encouraged nor discouraged.

### Formation of English Species and Subspecies Names

1. Long-established names in widespread use should be retained, regardless of any inaccuracy of description, behavior, habitat, location or phylogenetic relationship suggested by the name, unless there is a compelling and special reason.
2. The English name of every species shall be different from the name of every other species in North America.
3. The English name of a species need not repeat or reflect its scientific name.
4. English names will be given to genera, species, and subspecies.
5. The English name of a subspecies shall not be identical to the English name of the species.  
Example, *Terrapene carolina* and *T. c. carolina* were both called the Eastern Box Turtle. Now the English name for *T. c. carolina* is Woodland Box Turtle to avoid conflating the two taxa.
6. The English name given to a subspecies is not required to have any part of it be the same as the English name of the species to which it belongs.
7. Each word of a name shall be a word in the English language unless in unusual circumstances the committee finds it appropriate to use a word from a foreign language or directly adopted from scientific nomenclature.
8. Accepted English names proposed in this list should not be replaced by a local vernacular (but see 7).
9. Patronyms should neither be encouraged nor discouraged.
10. A patronym should be used in the possessive case.
11. Names should be changed if they are offensive to a substantial group of people, but need not be altered merely to reflect a change in the name of a country, region, or island.
12. Reference to geographical places and names may vary in form (e.g., Chihuahua vs. Chihuahuan) as deemed appropriate with respect to previous usage and clarity.
13. A name that refers to a small island or group of small islands should include the word “island” or “islands” if to do so brings clarity or avoids being misleading. In all other cases inclusion of “island” or “islands” in a name should depend primarily on prior usage.

14. Two or more English names may be used within a single genus. For example, under *Pituophis* there are pinesnakes, bullsnakes, and gophersnakes.

15. Words should be spelled consistently throughout the list, for example Mohave versus Mojave.

16. Words with accent marks in the language of their origin should be spelled with those marks only if reasonably necessary to indicate correct pronunciation in English.

17. Excessively long names should be avoided. Names should be as short as possible.

18. The full name of one species or subspecies should not be included in the longer name of a different species or subspecies. For example, if *Anaxyrus debilis* were called the Green Toad and *A. retiformis* were called the Sonoran Green Toad.

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**Anura—Frogs**

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***Acris* Duméril and Bibron, 1841—CRICKET FROGS**

***A. blanchardi* Harper, 1947—Blanchard's Cricket Frog**

Gamble et al. (2008, *Mol. Phylogenet. Evol.* 48: 112–125) recognized *Acris blanchardi* as distinct from *A. crepitans* on the basis of molecular evidence (and included *Acris crepitans paludicola* as a synonym of *A. blanchardi*), although McCallum and Trauth (2006, *Zootaxa* 1104: 1–21) previously rejected the distinctiveness of *A. c. blanchardi* from *A. c. crepitans* on the basis of morphology.

***A. crepitans* Baird, 1854—Eastern Cricket Frog**

See comment under *Acris blanchardi*.

***A. gryllus* (LeConte, 1825)—Southern Cricket Frog**

Two nominal subspecies occasionally are recognized, although whether they are arbitrary or historical units has not been adequately investigated. However, the molecular data presented by Gamble et al. (2008, *Mol. Phylogenet. Evol.* 48: 112–125) provide a good starting point.

*A. g. dorsalis* (Harlan, 1827)—Florida Cricket Frog

*A. g. gryllus* (LeConte, 1825)—Coastal Plain Cricket Frog

***Anaxyrus* Tschudi, 1845—NORTH AMERICAN TOADS**

This taxon of strictly North American toads was removed from “*Bufo*” (as well as were a number of other taxa) by Frost et al. (2006, *Bull. Am. Mus. Nat. Hist.*, 297) as a revision to render a monophyletic taxonomy and with genera delimited to be more compact than the unwieldy “*Bufo*”. The recent phylogenetic study of bufonids by Van Bocxlaer et al. (2010, *Science* 327: 679–682) also suggests that New World “*Bufo*” do not form a monophyletic group. Smith and Chiszar (2006, *Herpetol. Conserv. Biol.* 1: 6–8) recommend retaining the North American taxa *Anaxyrus*, *Incilius*, and *Rhinella* (as well as such long-recognized extralimital taxa such as *Ansonia*, *Capensibufo*, *Crepidophryne*, *Didynamipus*, *Mertensophryne*, *Nectophryne*, *Nectophrynoides*, *Pedostibes*, *Pelophryne*, *Schismaderma*, *Werneria*, and *Wolterstorffina*) as subgenera of *Bufo* to obviate the need for generic changes in North American species. This approach, though, would visit considerable nomenclatural instability on many countries outside of the USA and Canada. See Pauly et al. (2009, *Herpetologica* 65: 115–128) and Frost et al. (*Herpetologica* 65: 136–153) for discussion.

***A. americanus*** (Holbrook, 1836)—American Toad

Geographic variation has been insufficiently studied, although careful evaluation of call and/or molecular data might provide considerable evidence of divergent lineages. See comments under *A. baxteri*, *A. fowleri*, *A. hemiophrys*, *A. terrestris*, and *A. woodhousii*. Masta et al. (2002, Mol. Phylogenet. Evol. 24: 302–314) provided evidence that suggests that *A. a. charlesmithi* may be a distinct species.

*A. a. americanus* (Holbrook, 1836)—Eastern American Toad

*A. a. charlesmithi* (Bragg, 1954)—Dwarf American Toad

***A. baxteri*** (Porter, 1968)—Wyoming Toad

Recognized as a species, rather than a subspecies of *A. hemiophrys* by Packard (1971, J. Herpetol. 5: 191–193), and more recently by Smith et al. (1998, Contemp. Herpetol. 1). Nevertheless, Cook (1983, Publ. Nat. Sci. Natl. Mus. Canada 3) considered *A. baxteri* to be undiagnosable against the background of geographic variation in *A. hemiophrys* (as *Bufo americanus hemiophrys*), and this has not been addressed by subsequent authors.

***A. boreas*** (Baird and Girard, 1852)—Western Toad

See Schuierer (1963, Herpetologica 18: 262–267). Two nominal subspecies are generally recognized, although Goebel (2005, *In* Lannoo, M. [ed.], Amphibian Declines, Univ. California Press, pp. 210–211) discussed geographic variation and phylogenetics of the *A. boreas* (as the *Bufo boreas*) group (i.e., *A. boreas*, *A. canorus*, *A. exsul*, and *A. nelsoni*), and noted other unnamed populations of nominal *A. boreas* that may be species. Populations in Alberta, Canada, assigned to *A. boreas* have a distinct breeding call and vocal sacs (Cook, 1983, Publ. Nat. Sci. Natl. Mus. Canada 3); the taxonomic implications of this warrant investigation. Goebel et al. (2009, Mol. Phylogenet. Evol. 50: 209–225) suggested on the basis of molecular evidence that nominal *Anaxyrus boreas* is a complex of species (as suggested previously by Bogert, 1960, Animal Sounds Commun.: 179) that do not conform to the traditional limits of taxonomic species and subspecies (and which we do not recognize here for this reason) and that some populations assigned to this taxon may actually be more closely related to *Anaxyrus canorus* and *A. nelsoni*—a problem that calls for additional elucidation.

***A. californicus*** (Camp, 1915)—Arroyo Toad

See account (as *Bufo microscaphus californicus*) by Price and Sullivan (1988, Cat. Am. Amph. Rept. 415). See also Gergus (1998, Herpetologica 54: 317–325) for justification for this to be considered a distinct species from *Anaxyrus microscaphus*.

***A. canorus*** (Camp, 1916)—Yosemite Toad

Reviewed by Karlstrom (1973, Cat. Am. Amph. Rept. 132) as *Bufo canorus*. See comment under *A. boreas*.

***A. cognatus*** (Say, 1822)—Great Plains Toad

Reviewed by Krupa (1990, Cat. Am. Amph. Rept. 457) as *Bufo cognatus*.

***A. debilis*** (Girard, 1854)—Chihuahuan Green Toad

See accounts in Sanders and Smith (1951, Field and Laboratory 19: 141–160) and by Bogert (1962, Am. Mus. Novit. 2100) as *Bufo debilis*. The nominal subspecies are unlikely to be anything other than arbitrarily defined sections of clines although this remains to be investigated adequately.

*A. d. debilis* (Girard, 1854)—Eastern Chihuahuan Green Toad

*A. d. insidiar* (Girard, 1854)—Western Chihuahuan Green Toad

***A. exsul*** (Myers, 1942)—Black Toad

See comment under *A. boreas*.

***A. fowleri*** (Hinckley, 1882)—Fowler's Toad

Green (1996, Israel J. Zool. 42: 95–109) discussed the problem of interspecific



hybridization in the *A. americanus* complex and briefly addressed the publication by Sanders (1987, *Evol. Hybrid. Spec. N. Am. Indig. Bufonids*), in which Sanders recognized a number of dubiously delimited taxa within the *A. americanus* complex (his *Bufo hobarti*, which would be in the synonymy of *A. fowleri*; *Bufo copei*, which would be in *A. americanus*, and *Bufo planiorum* and *Bufo antecessor*, both of which would be in the synonymy of *A. woodhousii woodhousii*). None have been formally synonymized, nor have any attracted recognition by those working on the complex. See comment under *A. woodhousii*. Masta et al. (2002, *Mol. Phylogenet. Evol.* 24: 302–314) provided evidence for the distinctiveness of this species from *A. woodhousii* and noted (as did Smith and Green, 2004, *Mol. Ecol.* 13: 3723–3733) that at the molecular level there are multiple, distinct mitochondrially-recognizable populations in *A. fowleri*.

***A. hemiophrys*** (Cope, 1886)—Canadian Toad

See comment under *A. baxteri*. Cook (1983, *Publ. Nat. Sci. Natl. Mus. Canada* 3) regarded *A. hemiophrys* and *A. americanus* as forming very distinctive subspecies of one species, although subsequent authors (e.g., Green and Pustowka, 1997, *Herpetologica* 53: 218–228) have regarded the contact zone between these taxa as a hybrid zone between two species.

***A. houstonensis*** (Sanders, 1953)—Houston Toad

Reviewed by Brown (1973, *Cat. Am. Amph. Rept.* 133) as *Bufo houstonensis*.

***A. microscaphus*** (Cope, 1867)—Arizona Toad

See account by Price and Sullivan (1988, *Cat. Am. Amph. Rept.* 415) as *Bufo microscaphus*. See comment under *A. californicus*. Formerly included *A. californicus* and *A. mexicanus* (extralimital) as subspecies, both of which were recognized as species by Gergus (1998, *Herpetologica* 54: 317–325).

***A. nelsoni*** (Stejneger, 1893)—Amargosa Toad

Stebbins (1985, *A Field Guide to Western Reptiles and Amphibians*, Houghton Mifflin, Boston) and Altig et al. (1998, *Contemp. Herpetol. Inform. Serv.* 2) regarded *A. nelsoni* as a species, rather than a subspecies of *A. boreas*. See comment under *A. boreas*.

***A. punctatus*** (Baird and Girard, 1852)—Red-spotted Toad

Reviewed by Korky (1999, *Cat. Am. Amph. Rept.* 1104) as *Bufo punctatus*.

***A. quercicus*** (Holbrook, 1840)—Oak Toad

Reviewed by Ashton and Franz (1979, *Cat. Am. Amph. Rept.* 222) as *Bufo quercicus*.

***A. retiformis*** (Sanders and Smith, 1951)—Sonoran Green Toad

Reviewed by Hulse (1978, *Cat. Am. Amph. Rept.* 207) as *Bufo retiformis*.

***A. speciosus*** (Girard, 1854)—Texas Toad

Older literature confused this species with *A. cognatus*, *A. mexicanus* (extralimital), and *A. compactilis* (extralimital). Rogers (1972, *Copeia* 1972: 381–383) demonstrated its morphological distinctiveness.

***A. terrestris*** (Bonnaterre, 1789)—Southern Toad

No reports of geographic variation exist in the literature, although extensive geographic variation is evident on examination of specimens. Hybridization with *A. americanus* along the Fall Line may have strong effects on geographic variation, although data on this have not been published. Reviewed by Blem (1979, *Cat. Am. Amph. Rept.* 223) as *Bufo terrestris*.

***A. woodhousii*** (Girard, 1854)—Woodhouse's Toad

See comments under *A. fowleri*. The unjustified emendation of the species name to *woodhousei* has been used widely. The status of taxa recognized by Sanders (1987, *Evol. Hybrid. Spec. N. Am. Indig. Bufonids*) has not been evaluated closely by any author, although neither have they enjoyed any recognition. Evidence provided by Masta et

al. (2002, Mol. Phylogenet. Evol. 24: 302–314) suggests that *A. w. australis* may be a distinct species and that former *A. w. velatus* is a hybrid population of *A. woodhousii* × *A. fowleri*, and therefore should not be recognized.

*A. w. australis* (Shannon and Lowe, 1955)—Southwestern Woodhouse’s Toad

*A. w. woodhousii* Girard, 1854—Rocky Mountain Toad

***Ascaphus* Stejneger, 1899—TAILED FROGS**

***A. montanus*** Mittleman and Myers, 1949—Rocky Mountain Tailed Frog  
See Nelson et al. (2001, Evolution 55: 147–160) for evidence supporting the recognition of this species distinct from *A. truei*.

***A. truei*** Stejneger, 1899—Coastal Tailed Frog  
See Metter (1968, Cat. Am. Amph. Rept. 69) for review (as including *A. montanus*).

Bufo: See *Anaxyrus*, *Incilius*, and *Rhinella*. *Bufo*, as now recognized, is extralimital.

***Craugastor* Cope, 1862—NORTHERN RAINFROGS**

This taxon of predominantly Mexican and Central American frogs was removed from a paraphyletic “*Eleutherodactylus*” by Crawford and Smith (2005, Mol. Phylogenet. Evol. 35: 536–555).

***C. augusti*** (Dugès, 1879)—Barking Frog  
Reviewed by Zweifel (1967, Cat. Am. Amph. Rept. 41) as *Eleutherodactylus augusti*. Goldberg et al. (2004, Herpetologica 60: 312–320) suggested that *C. a. cactorum* and *C. a. latrans* are different species but did not execute a formal taxonomic change.

*C. a. cactorum* Taylor, 1939 “1938”—Western Barking Frog

*C. a. latrans* (Cope, 1880)—Balcones Barking Frog

***Eleutherodactylus* Duméril and Bibron, 1841—RAINFROGS**

See *Craugastor*. Frost et al. (2006, Bull. Am. Mus. Nat. Hist., 297) recognized *Syrrophus* for a monophyletic group containing *E. cystignathoides*, *E. guttilatus*, and *E. marnockii* and *Euhyas* for a group containing *E. planirostris*. Heinicke et al. (2007, Proc. Natl. Acad. Sci. USA 104: 10092–97) and Hedges et al. (2008, Zootaxa 1737: 1–182) redelimited *Eleutherodactylus* as monophyletic by exclusion of a number of South American taxa and treated (and redelimited) *Euhyas* and *Syrrophus* as subgenera of *Eleutherodactylus*.

***E. cystignathoides*** (Cope, 1877)—Rio Grande Chirping Frog  
Two nominal subspecies named, of which only one of which enters the USA. The status of these taxa, whether they represent arbitrarily delimited parts of a single population or different lineages is unknown.

*E. c. campi* Stejneger, 1915—Rio Grande Chirping Frog

***E. guttilatus*** (Cope, 1879)—Spotted Chirping Frog  
Geographic variation is poorly known. Some authors (e.g. Morafka, 1977, Biogeographica 9) considered *E. guttilatus* to be a synonym of *E. c. campi* (and by extension, of *E. cystignathoides*) but this remains to be sufficiently tested.

***E. marnockii*** (Cope, 1878)—Cliff Chirping Frog  
See account by Lynch (1970, Univ. Kansas Publ. Mus. Nat. Hist. 20: 1–45). Geographic variation is not well studied.

***Gastrophryne*** Fitzinger, 1843—NORTH AMERICAN NARROW-MOUTHED TOADS

Reviewed by Nelson (1972, *J. Herpetol.* 6: 111–137; 1973, *Cat. Am. Amph. Rept.* 134).

***G. carolinensis*** (Holbrook, 1835)—Eastern Narrow-mouthed Toad

Reviewed by Nelson (1972, *Cat. Am. Amph. Rept.* 120); details of distribution in Nelson (1972, *J. Herpetol.* 6: 125–128).

***G. olivacea*** (Hallowell, 1856)—Western Narrow-mouthed Toad

Reviewed by Nelson (1972, *Cat. Am. Amph. Rept.* 122); details of distribution given by Nelson (1972, *J. Herpetol.* 6: 129–130). Cryptic species possible given the extensive distribution of this species.

***Hyla*** Laurenti, 1768—HOLARCTIC TREEFROGS

Faivovich et al. (2005, *Bull. Am. Mus. Nat. Hist.*, 294) redelimited this monophyletic taxon to include only North American and Eurasian species. Hua et al. (2009, *Herpetologica* 65: 246–259) discussed relationships within the group.

***H. andersonii*** Baird, 1854—Pine Barrens Treefrog

Reviewed by Gosner and Black (1967, *Cat. Am. Amph. Rept.* 54). The widely disjunct populations have been examined with allozymes and only subtle (no fixed differences) geographic variation was documented (Karlin et al., 1982, *Copeia* 1982: 175–178).

***H. arenicolor*** Cope, 1866—Canyon Treefrog

Barber (1999, *Mol. Ecol.* 8: 563–576) examined geographic variation and suggested that at least two other species should be recognized within the Mexican component of its range.

***H. avivoca*** Viosca, 1928—Bird-voiced Treefrog

Smith (1953, *Herpetologica* 9: 169–173) discussed geographic variation and recognized two nominal subspecies. Whether these represent arbitrary or historical units is unknown. For discussion see Smith (1966, *Cat. Am. Rept. Amph.* 28).

*H. a. avivoca* Viosca, 1928—Western Bird-voiced Treefrog*H. a. ogechiensis* Neill, 1948—Eastern Bird-voiced Treefrog***H. chrysoscelis*** Cope, 1880—Cope's Gray Treefrog

See comment under *H. versicolor*. Reviewed by Hoffman (1988, *Cat. Am. Amph. Rept.* 436).

***H. cinerea*** (Schneider, 1799)—Green Treefrog

Subspecies occasionally are recognized (*H. c. cinerea* and *H. c. evittata*) without discussion, and on the basis of a single populationally variable character. See Duellman and Schwartz (1958, *Bull. Florida State Mus., Biol. Sci.* 3: 241) for discussion and rejection of subspecies. Reviewed by Redmer and Brandon (2003, *Cat. Am. Amph. Rept.* 766).

***H. femoralis*** Bosc, 1800—Pine Woods Treefrog

Reviewed by Hoffman (1988, *Cat. Am. Amph. Rept.* 436).

***H. gratiose*** LeConte, 1856—Barking Treefrog

Reviewed by Caldwell (1982, *Cat. Am. Amph. Rept.* 298).

***H. squirella*** Bosc, 1800—Squirrel Treefrog

Reviewed by Martof (1975, *Cat. Am. Amph. Rept.* 168).

***H. versicolor*** LeConte, 1825—Gray Treefrog

Holloway et al. (2006, *Am. Nat.* 167: E88–E101) discussed the role of *H. chrysoscelis* in the formation of the tetraploid *H. versicolor*; reviewed previous literature, and provided a revised range.

***H. wrightorum*** Taylor, 1939 “1938”—Arizona Treefrog

Gergus et al. (2004, *Copeia* 2004: 758–769) reported on the distinctiveness of this species with respect to *H. eximia* (extralimital).

***Hypopachus*** Keferstein, 1867—SHEEP FROGS***H. variolosus*** (Cope, 1866)—Sheep Frog

See Nelson (1973, *Herpetologica* 29: 6–17; 1974, *Herpetologica* 30: 250–274) for discussion of geographic variation and rejection of subspecies. Although only two species are currently recognized within this genus, very strong geographic variation in coloration, call, and toe structure suggests that several species are masquerading under this particular name. Given that the type locality of *H. variolosus* is in Costa Rica, one can look forward to the scientific name applied to the U.S. form to change.

***Incilius*** Cope, 1863—CENTRAL AMERICAN TOADS

This taxon of predominantly Central American toads was recently removed from a paraphyletic “*Bufo*” by Frost et al. (2006, *Bull. Am. Mus. Nat. Hist.*, 297; as *Cranopsis*). However, the oldest name for this taxon is *Incilius* Cope, 1863 (see Frost et al., 2009, *Copeia* 2009: 418–419) which therefore takes precedence. See comment under *Anaxyrus*. Van Bocxlaer et al. (2010, *Science*, 327: 679–682) presented evidence that *Incilius* may be paraphyletic with respect to *Anaxyrus* due to the placement of one extralimital species.

***I. alvarius*** (Girard, 1859)—Sonoran Desert Toad

Reviewed by Fouquette (1970, *Cat. Am. Amph. Rept.* 93) as *Bufo alvarius*.

***I. nebulifer*** (Girard, 1854)—Gulf Coast Toad

Mulcahy and Mendelson (2000, *Mol. Phylogenet. Evol.* 17: 173) recognized this species, as *Bufo nebulifer*; and as distinct from *I. valliceps*, an extralimital species.

***Leptodactylus*** Fitzinger, 1826—NEOTROPICAL GRASS FROGS***L. fragilis*** (Brocchi, 1877)—Mexican White-lipped Frog

Reviewed by Heyer et al. (2006, *Cat. Am. Amph. Rept.* 830). Much of the older literature about this species refers to it incorrectly as *Leptodactylus labialis*.

***Lithobates*** Fitzinger, 1843—AMERICAN WATER FROGS

This taxon of North, Central, and South American frogs was removed from the large and predominantly Eurasian genus *Rana* by Frost et al. (2006, *Bull. Am. Mus. Nat. Hist.*, 297). Hillis and Wilcox (2005, *Mol. Phylogenet. Evol.* 34: 299–314) provided a phylogenetic taxonomy that retained the species now under *Lithobates* within *Rana* and restricted the use of that name to a small part of what was subsequently assigned to *Lithobates* by Frost et al. (2006). Dubois (2006, *Mol. Phylogenet. Evol.* 42: 317–330) criticized the nomenclatural proposals of Hillis and Wilcox and regarded their names as *nomina nuda* and their approach outside of the International Code of Zoological Nomenclature (1999). This criticism was responded to by Hillis (2006, *Mol. Phylogenet. Evol.* 42: 331–338), who argued that most of the new names proposed by Hillis and Wilcox do have nomenclatural status under the International Code of Zoological Nomenclature (1999). The revision by Che et al. (2007, *Mol. Phylogenet. Evol.* 42: 1–13) which recognized *Lithobates* as a genus, we think best reflects the majority opinion of members of the international community who are actively working on large-scale ranid relationships, although Hillis, 2007 (*Mol. Phylogenet. Evol.* 42: 331–338) ) and Wiens et al. (2009, *Evolution* 63: 1217–1231) expressed reluctance to accept this taxonomy. Dubois (2006, *Mol. Phylogenet. Evol.* 42: 317–330; 2007, *Cladistics* 23: 390–402), Hillis (2007, *Mol. Phylogenet. Evol.* 42: 331–338), Pauly et al. (2009, *Herpetologica* 65: 115–128), Frost et al. (2009, *Herpetologica*, 65: 136–153) have discussed the issues surrounding the nomenclature of North American ranids.

***L. areolatus*** (Baird and Girard, 1852)—Crawfish Frog

See comment under *L. capito*. Reviewed by Altig and Lohoefer (1983, Cat. Am. Amph. Rept. 324) as *Rana areolata*. Geographic variation deserves further study to determine status of the nominal subspecies.

*L. a. areolatus* (Baird and Girard, 1852)—Southern Crawfish Frog

*L. a. circulosus* (Rice and Davis, 1878)—Northern Crawfish Frog

***L. berlandieri*** (Baird, 1859)—Rio Grande Leopard Frog

Geographic variation is not well documented and relationships with extralimital Mexican forms (e.g., *L. forreri*, *L. brownorum*) are not well understood.

***L. blairi*** (Mecham, Littlejohn, Oldham, Brown, and Brown, 1973)—Plains Leopard Frog

Reviewed by Brown (1992, Cat. Am. Amph. Rept. 536) as *Rana blairi*. Isolated western populations have not been well studied.

***L. capito*** (Le Conte, 1855)—Gopher Frog

*Lithobates capito* is considered by some to be part of *L. areolatus* (but see Case, 1978, Syst. Zool. 27: 299–311, who considered them distinct). Reviewed by Altig and Lohoefer (1983, Cat. Am. Amph. Rept. 324) as *Rana areolata capito*. Recognized as distinct from *L. areolatus* by Young and Crother (2001, Copeia, 2001: 382–388), who also rejected subspecies.

***L. catesbeianus*** (Shaw, 1802)—American Bullfrog

Geographic variation within the natural range *L. catesbeianus* is not well understood although Austin et al. (2004, Mol. Phylogenet. Evol. 32: 799–816) presented mitochondrial DNA evidence of distinct eastern and western lineages.

***L. chiricahuensis*** (Platz and Mecham, 1979)—Chiricahua Leopard Frog

The status of southern Arizona and Mexican populations needs study. *Rana subaquavocalis* Platz, 1993, is a synonym according to Goldberg et al. (2004, J. Herpetol. 38: 313–319), although some authors (e.g., Hillis and Wilcox, 2005, Mol. Phylogenet. Evol. 34: 299–314; Dubois, 2006, C. R. Biol., Paris 329: 823–840) have continued to recognize the two taxa as distinct species, without comment. See comment under *L. fisheri*.

***L. clamitans*** (Latreille, 1801)—Green Frog

The status of the nominal subspecies requires investigation to determine whether they are arbitrary or evolutionary units. Reviewed by Stewart (1968, Cat. Am. Amph. Rept. 337) as *Rana clamitans*. Austin and Zamudio (2008, Mol. Phylogenet. Evol. 48: 1041–1053) reported on interpopulational variation at the molecular level and suggested an historical structure inconsistent with the recognized subspecies, which are here rejected on that basis.

***L. fisheri*** (Stejneger, 1893)—Vegas Valley Leopard Frog

Until recently, this species has been considered to be highly restricted in range and extinct. However, Hekkala et al. (2011, Conserv. Genet. DOI 10.1007/s10592-011-0229-6) used DNA sequence data from museum specimens to show that *L. fisheri* and frogs ascribed to *R. chiricahuensis* from near the Mogollon Rim in central Arizona comprise a lineage that is distinct from *R. chiricahuensis* populations to the south and east. Platz (1993, J. Herpetol. 27: 154–162) previously noted the various lines of evidence suggesting that *L. chiricahuensis* was composed of more than one species, with the central Arizona population notably distinctive, but it was not possible, at that time, to compare those frogs genetically with *L. fisheri*.

***L. grylio*** (Stejneger, 1901)—Pig Frog

Reviewed by Altig and Lohoefer (1982, Cat. Am. Amph. Rept. 286), as *Rana grylio*.

***L. heckscheri*** (Wright, 1924)—River Frog

Reviewed by Sanders (1984, Cat. Am. Amph. Rept. 348) as *Rana heckscheri*.

***L. okaloosae*** (Moler, 1985)—Florida Bog Frog

Reviewed by Moler (1993, Cat. Am. Amph. Rept. 561) as *Rana okaloosae*. Austin et al. (2003, Biol. J. Linn. Soc. 80: 601–624) discussed the genetic relationship of *L. okaloosae* and *L. clamitans*.

***L. onca*** (Cope, 1875)—Relict Leopard Frog

The status of this taxon is controversial. Jaeger et al. (2001, Copeia 2001: 339–351), noted a close relationship with *L. yavapaiensis*, and Pfeiler and Markow (2008, Mol. Phylogenet. Evol. 49: 343–348) reported evidence consistent with a close or identical relationship with *L. yavapaiensis*. Reviewed by Jennings (1988, Cat. Am. Amph. Rept. 417) as *Rana onca*.

***L. palustris*** (LeConte, 1825)—Pickerel Frog

Geographic variation studied by Pace (1974, Misc. Publ. Mus. Zool. Univ. Michigan 148). Reviewed by Schaaf and Smith (1971, Cat. Am. Amph. Rept. 117) as *Rana palustris*. Newman, Feinberg, Rissler, Burger, and Shaffer, 2012, Mol. Phylogenet. Evol., 63: 445–455, noted, but did not name, a previously undetected species, the apparent sister taxon of *L. palustris*, with a range of northern New Jersey, through New York City, likely to western Connecticut, USA. Obviously the genetic variation among populations of nominal *L. palustris* needs additional sampling to see what congruences can be found with the earlier work of Schaaf and Smith, 1970, Herpetologica, 26: 240–254.

***L. pipiens*** (Schreber, 1782)—Northern Leopard Frog

Synonymy and discussion in Pace (1974, Misc. Publ. Mus. Zool. Univ. Michigan 148) as *Rana pipiens*.

***L. septentrionalis*** (Baird, 1854)—Mink Frog

Reviewed by Hedeon (1977, Cat. Am. Amph. Rept. 202) as *Rana septentrionalis*.

***L. sevosus*** (Goin and Netting, 1940)—Dusky Gopher Frog

Reviewed by Altig and Lohofener (1983, Cat. Am. Amph. Rept. 324) as *Rana areolata sevosus*. Recognized as distinct from *L. capito* and *L. areolatus* by Young and Crother (2001, Copeia, 2001: 382–388).

***L. sphenocephalus*** (Cope, 1886)—Southern Leopard Frog

Pace (1974, Misc. Publ. Mus. Zool. Univ. Michigan 148) revived the older name *Rana utricularius* Harlan, 1825, for this species, which Pace emended to *R. utricularia*. Subsequently, the International Commission of Zoological Nomenclature moved (Opinion, 1685, 1992, Bull. Zool. Nomencl. 49: 171–173) to suppress *R. utricularia* for purposes of priority in favor of *R. sphenocephala*, leaving the unusual situation of the subspecies name *sphenocephalus* having priority over the older species name, *utricularius*. The status of the nominal subspecies requires detailed examination (see Brown et al., 1977, Bull. Zool. Nomencl. 33: 199–200; Zug, 1982, Bull. Zool. Nomencl. 39: 80–81; and Uzzell, 1982, Bull. Zool. Nomencl. 39: 83).

***L. s. sphenocephalus*** (Cope, 1886)—Florida Leopard Frog***L. s. utricularius*** (Harlan, 1825)—Coastal Plains Leopard Frog***L. sylvaticus*** (LeConte, 1825)—Wood Frog

The extensive morphological variation in this species was examined by Martof and Humphries (1959, Amer. Midl. Nat. 61: 350–389), who rejected previously recognized taxonomic divisions; however a study of DNA sequence variation by Lee-Yaw et al. (2008, Mol. Ecol. 17: 867–884) revealed two distinct clades corresponding to eastern and western populations. Reviewed by Martof (1970, Cat. Am. Amph. Rept. 86) as *Rana sylvatica*.

***L. tarahumarae*** (Boulenger, 1917)—Tarahumara Frog

Extinct in the USA although persisting in Mexico. Attempts are being made to reintroduce the species into former Arizona localities. Reviewed by Zweifel (1968, Cat. Am. Amph. Rept. 66) as *Rana tarahumarae*.

***L. virgatipes*** (Cope, 1891)—Carpenter Frog

Reviewed by Gosner and Black (1968, Cat. Am. Amph. Rept. 67) as *Rana virgatipes*. Data provided by Pytel (1986, Herpetologica 42: 273–282) suggest that careful evaluation for cryptic species is warranted.

***L. yavapaiensis*** (Platz and Frost, 1984)—Lowland Leopard Frog

See comment under *L. onca*.

***Pseudacris*** Fitzinger, 1843—CHORUS FROGS

Lemmon et al. (2007, Mol. Phylogenet. Evol. 44: 1068–1082) revised the *P. nigrita* group (*P. brimleyi*, *P. brachyphona*, *P. clarkii*, *P. feriarum*, *P. kalmi*, *P. maculata*, and *P. triseriata*) and an unnamed species, which was subsequently named as *Pseudacris fouquettei*.

***P. brachyphona*** (Cope, 1889)—Mountain Chorus Frog

Reviewed by Hoffmann (1980, Cat. Am. Amph. Rept. 234).

***P. brimleyi*** Brandt and Walker, 1933—Brimley's Chorus Frog

Reviewed by Hoffmann (1983, Cat. Am. Amph. Rept. 311).

***P. cadaverina*** (Cope, 1866)—California Treefrog

Reviewed by Gaudin (1979, Cat. Am. Amph. Rept. 225) as *Hyla cadaverina*. Phillipsen and Metcalf (2009, Mol. Phylogenet. Evol. 53: 152–170) reported on considerable geographic structure at the molecular level among populations.

***P. clarkii*** (Baird, 1854)—Spotted Chorus Frog

Reviewed by Pierce and Whitehurst (1990, Cat. Am. Amph. Rept. 458).

***P. crucifer*** (Wied-Neuwied, 1838)—Spring Peeper

Moriarty and Cannatella (2004, Mol. Phylogenet. Evol. 30: 409–420) rejected subspecies.

***P. feriarum*** (Baird, 1854)—Upland Chorus Frog

See comment under *P. kalmi*.

***P. fouquettei*** Lemmon, Lemmon, Collins, and Cannatella, 2008—Cajun Chorus Frog***P. hypochondriaca*** (Hallowell, 1854)—Baja California Treefrog

Recuero et al. (2006, Mol. Phylogenet. Evol. 39: 293–304) recognized this species as distinct from *P. regilla* and composed of two subspecies, one of which is extralimital, and whose mutual status is unclear.

***P. h. hypochondriaca*** (Hallowell, 1854)—Northern Baja California Treefrog***P. illinoensis*** Smith, 1951—Illinois Chorus Frog

Moriarty and Cannatella (2004, Mol. Phylogenet. Evol. 30: 409–420) discussed the arguable distinctiveness of this taxon with respect to *Pseudacris streckeri*.

***P. kalmi*** Harper, 1955—New Jersey Chorus Frog

Platz (1989, Copeia 1989: 704–712) retained *P. feriarum* and *P. kalmi* as subspecies of one species but suggested that they might also be distinct species on the basis of data presented by Hedges (1986, Syst. Zool. 35: 1–21). Lemmon et al. (2007, Mol. Phylogenet. Evol. 44: 1068–1082) confirmed that *P. kalmi* and *P. feriarum* are distinct species although the contact zone between these taxa is poorly understood.

***P. maculata*** (Agassiz, 1850)—Boreal Chorus Frog

Considered a species distinct from *P. triseriata* by Platz (1989, Copeia 1989: 704–712). Lemmon et al. (2007, Mol. Phylogenet. Evol. 44: 1068–1082) revised the geographic limits of this species based on mitochondrial DNA evidence.

***P. nigrata*** (Le Conte, 1825)—Southern Chorus Frog

Reviewed by Gates (1988, Cat. Am. Amph. Rept. 416). Subspecies rejected by Moriarty and Cannatella (2004, Mol. Phylogenet. Evol. 30: 409–420).

***P. ocularis*** (Bosc and Daudin, 1801)—Little Grass Frog

Reviewed by Franz and Chantell (1978, Cat. Am. Amph. Rept. 209) as *Limnaeodius ocularis*.

***P. ornata*** (Holbrook, 1836)—Ornate Chorus Frog

For discussion see Harper (1937, Am. Midl. Nat. 18: 260–272).

***P. regilla*** (Baird and Girard, 1852)—Pacific Treefrog

Recuero et al. (2006, Mol. Phylogenet. Evol. 39: 293–304) redelimited this species and revised its range.

***P. sierra*** (Jameson, Mackey, and Richmond, 1966)—Sierran Treefrog

Recognized as distinct from *P. regilla* by Recuero et al. (2006, Mol. Phylogenet. Evol. 39: 293–304; 2006, Mol. Phylogenet. Evol. 41: 511).

***P. streckeri*** Wright and Wright, 1933—Strecker's Chorus Frog

Reviewed by Smith (1966, Cat. Am. Amph. Rept. 27). See comment under *P. illinoensis*.

***P. triseriata*** (Wied-Neuwied, 1838)—Western Chorus Frog

See comment under *P. maculata*. Lemmon et al. (2007, Mol. Phylogenet. Evol. 44: 1068–1082) revised the geographic limits of this species based on mitochondrial DNA evidence.

***Rana*** Linnaeus, 1758—BROWN FROGS

This large taxon of predominantly Eurasian frogs was redelimited by Frost et al. (2006, Bull. Am. Mus. Nat. Hist., 297, and Che et al. (2007, Mol. Phylogenet. Evol. 42: 1–13) to exclude a number of taxa (e.g., *Lithobates*, *Glandirana*, *Odorrana*, *Pelophylax*). See *Lithobates* for most North American species formerly associated with *Rana* and comments regarding taxonomy.

***R. aurora*** Baird and Girard, 1852—Northern Red-legged Frog

Reviewed (in the sense of including *R. draytonii*) by Altig and Dumas (1972, Cat. Am. Amph. Rept. 160). Evidence of the distinctiveness of this species from *R. draytonii* was provided by Hayes and Miyamoto (1984, Copeia 1984: 1018–1022), Shaffer et al. (2004, Mol. Phylogenet. Evol. 13: 2667–2677), Conlon et al. (2006, Peptides 27: 1305–1312), and Pauly et al. (2008, J. Herpetol. 42: 668–679).

***R. boylei*** Baird, 1854—Foothill Yellow-legged Frog

See Zweifel (1968, Cat. Am. Amph. Rept. 71) for review. Molecular study of geographic variation of this rapidly-disappearing species should prove illuminating.

***R. cascadae*** Slater, 1939—Cascades Frog

Reviewed by Altig and Dumas (1971, Cat. Am. Amph. Rept. 105). The disjunct populations should be investigated with respect to call and molecular parameters.

***R. draytonii*** Baird and Girard, 1852—California Red-legged Frog

See comment under *R. aurora*.

***R. luteiventris*** Thompson, 1913—Columbia Spotted Frog

Green et al. (1996, Evolution 50: 374–390) and Cuellar (1996, Biogeographica 72: 145–150) suggested that *R. pretiosa* was composed of two sibling species. Subsequently Green



et al. (1997, Copeia 1997: 1–8) recognized the eastern and northern form, *R. luteiventris*, as a species distinct from *Rana pretiosa*.

***R. muscosa*** Camp, 1917—Southern Mountain Yellow-legged Frog  
See Zweifel (1968, Cat. Am. Amph. Rept. 65) for review. Vredenburg et al. (2007, J. Zool. 271: 361–374) discussed the systematics of this species and its disappearance from large parts of its former range.

***R. pretiosa*** Baird and Girard, 1853—Oregon Spotted Frog  
See comment under *R. luteiventris*.

***R. sierrae*** Camp, 1917—Sierra Nevada Yellow-legged Frog  
Vredenburg et al. (2007, J. Zool. 271: 361–374) recognized this species as distinct from *R. muscosa*.

### ***Rhinella*** Fitzinger, 1826—SOUTH AMERICAN TOADS

This genus of predominantly South American toads was recently redelimited by Chaparro et al. (2007, Herpetologica 63: 203–212) to reflect the phylogenetic results of Pramuk (2006, Zool. J. Linn. Soc. 146: 407–452). Van Bocxlaer et al. (2010, Science 327: 679–682) suggested that *Rhinella* is only distantly related to North American toads of the genera *Incilius* and *Anaxyrus*.

***R. marina*** (Linnaeus, 1758)—Cane Toad  
Reviewed by Easteal (1986, Cat. Am. Amph. Rept. 395) as *Bufo marinus*. Vallinoto et al. (2010, Zool. Scripta 39: 128–140) provided molecular evidence that the North and Central American population may be a distinct species from the South American populations (at least one of which bears the name *R. marina*), which suggests that the name applied to the USA population likely will change as relationships become more clear.

### ***Rhinophrynus*** Duméril and Bibron, 1841—BURROWING TOADS

***R. dorsalis*** Duméril and Bibron, 1841—Burrowing Toad  
Geographic variation has not been studied in any detail and cryptic lineages are a possibility. Reviewed by Fouquette (1969, Cat. Am. Amph. Rept. 78).

### ***Scaphiopus*** Holbrook, 1836—NORTH AMERICAN SPADEFOOTS

See comment under *Spea*.

***S. couchii*** Baird, 1854—Couch's Spadefoot  
Reviewed by Wasserman (1970, Cat. Am. Amph. Rept. 85). Geographic variation is poorly documented.

***S. holbrookii*** (Harlan, 1835)—Eastern Spadefoot  
Reviewed by Wasserman (1968, Cat. Am. Amph. Rept. 70) as *Scaphiopus h. holbrookii*.

***S. hurterii*** Strecker, 1910—Hurter's Spadefoot  
Reviewed by Wasserman (1968, Cat. Am. Amph. Rept. 70) as *Scaphiopus holbrookii hurterii*.

### ***Smilisca*** Cope, 1865—MEXICAN TREEFROGS

The content of this taxon was recently redelimited by Faivovich et al. (2005, Bull. Am. Mus. Nat. Hist. 294) to include former *Pternohyla*.

***S. baudinii*** (Duméril and Bibron, 1841)—Mexican Treefrog  
Reviewed by Duellman (1968, Cat. Am. Amph. Rept. 59).

*S. fodiens* (Boulenger, 1882)—Lowland Burrowing Treefrog  
Reviewed by Trueb (1969, Cat. Am. Amph. Rept. 77) as *Pternohyla fodiens*.

***Spea*** Cope, 1866—WESTERN SPADEFOOTS

Tanner (1989, Great Basin Nat. 49: 38–70) and Wiens and Titus (1991, Herpetologica 47: 21–28) recognized *Spea* as distinct from *Scaphiopus*, within which it was previously regarded as a subgenus.

***S. bombifrons*** (Cope, 1863)—Plains Spadefoot

Known to hybridize with *S. multiplicata* in parts of their ranges (Brown, 1976, Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. 286). Geographic variation is poorly documented.

***S. hammondi*** (Baird, 1859 “1857”)—Western Spadefoot

This name formerly covered populations now referred to *S. multiplicata* and *S. intermontana* until separated by Brown (1976, Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. 286). See Tanner (1989, Great Basin Nat. 49: 503–510) for discussion, although he continued to retain these species as subspecies of *S. hammondi*, a position rejected by Wiens and Titus (1991, Herpetologica 47: 21–38).

***S. intermontana*** (Cope, 1883)—Great Basin Spadefoot

Geographic variation very poorly documented, and, according to evidence provided by Titus and Wiens (1991, Herpetologica 47: 21–29), this nominal species may be a paraphyletic composite of at least two species. Reviewed by Hall (1999, Cat. Am. Amph. Rept. 650).

***S. multiplicata*** (Cope, 1863)—Mexican Spadefoot

Considered a species distinct from *S. hammondi* by Brown (1976, Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. 286) and by Titus and Wiens (1991, Herpetologica 47: 21–28). Regarded, on the basis of overall similarity and paleoclimatic inference to be conspecific with *S. hammondi* by Van Devender, Mead, and Rea (1991, Southwest. Nat. 36: 302–314) and by Tanner (1989, Great Bas. Nat. 49: 503–510). Tanner recognized *S. h. stagnalis* Cope as the northern (Arizona to central Chihuahua) subspecies of his *Spea hammondi*, though the phylogenetic evidence presented by Titus and Wiens indicated it to be part of *S. multiplicata*. Geographic variation has not been carefully studied and cryptic species are possible.

*S. m. stagnalis* (Cope, 1875)—Chihuahuan Desert Spadefoot

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**Caudata — Salamanders**


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***Ambystoma*** Tschudi, 1838—MOLE SALAMANDERS

***A. annulatum*** Cope, 1886—Ringed Salamander

***A. barbouri*** Kraus and Petranksa, 1989—Streamside Salamander

***A. bishopi*** Goin, 1950—Reticulated Flatwoods Salamander

Pauly, Piskurek and Shaffer (2006, *Mol. Ecol.* 16: 415–429) recognized western populations of *A. cingulatum* as a distinct species. They inadvertently reversed the proposed vernacular name with that for *A. cingulatum*.

***A. californiense*** Gray, 1853—California Tiger Salamander

***A. cingulatum*** Cope, 1868—Frosted Flatwoods Salamander

Pauly, Piskurek and Shaffer (2006, *Mol. Ecol.* 16: 415–429) recognized western populations of *A. cingulatum* as a distinct species (*A. bishopi*) and proposed a new vernacular name for this species. They inadvertently reversed the proposed vernacular name with that for *A. bishopi*.

***A. gracile*** (Baird, 1859)—Northwestern Salamander

***A. jeffersonianum*** (Green, 1827)—Jefferson Salamander

Taxonomic recognition of hybrid, asexual forms that combine genomes of *A. laterale*, *A. texanum*, *A. tigrinum*, and this species raises complex issues dealing with discordance between cytoplasmic and nuclear genes, reticulate evolution, and genome-swapping (Bogart, 2003, *in* Sever, D.M. [ed.], *Reproductive Biology and Phylogeny of Urodela*, Science Publishers, Inc., Pp. 109–134). Bi and Bogart (2010, *BMC Evol. Biol.* 10: 238) confirm an ancient origin for the mitochondrial genome shared by asexual forms of this complex.

***A. laterale*** Hallowell, 1856—Blue-spotted Salamander

See comment under *A. jeffersonianum*.

***A. mabeei*** Bishop, 1928—Mabee’s Salamander

***A. macrodactylum*** Baird, 1850—Long-toed Salamander

*A. m. columbianum* Ferguson, 1961—Eastern Long-toed Salamander

*A. m. croceum* Russell and Anderson, 1956—Santa Cruz Long-toed Salamander

*A. m. krausei* Peters, 1882—Northern Long-toed Salamander

*A. m. macrodactylum* Baird, 1850—Western Long-toed Salamander

*A. m. sigillatum* Ferguson, 1961—Southern Long-toed Salamander

***A. maculatum*** (Shaw, 1802)—Spotted Salamander

***A. mavortium*** Baird, 1850 “1849”—Western Tiger Salamander

Shaffer and McKnight (1996, *Evolution* 50: 417–433) provided molecular phylogenetic data indicating that the eastern and western tiger salamanders should be regarded as distinct species and treated the western forms as subspecies of *Ambystoma mavortium*. Lannoo (2005, *in* Lannoo M., [ed.], *Amphibian Declines, Status of United States Species*, Univ. California Press, Pp. 636–639) includes *A. mavortium* in *A. tigrinum*.

- A. m. diaboli* Dunn, 1940—Gray Tiger Salamander  
*A. m. melanostictum* (Baird, 1860)—Blotched Tiger Salamander  
*A. m. mavortium* Baird, 1850 “1849”—Barred Tiger Salamander  
*A. m. nebulosum* Hallowell, 1853—Arizona Tiger Salamander  
*A. m. stebbinsi* Lowe, 1954—Sonoran Tiger Salamander  
*A. opacum* (Gravenhorst, 1807)—Marbled Salamander  
*A. talpoideum* (Holbrook, 1838)—Mole Salamander  
*A. texanum* (Matthes, 1855)—Small-mouthed Salamander  
*A. tigrinum* (Green, 1825)—Eastern Tiger Salamander

See comment under *A. mavortium*.

***Amphiuma*** Garden, 1821—AMPHIUMAS

- A. means* Garden, 1821—Two-toed Amphiuma  
*A. pholeter* Neill, 1964—One-toed Amphiuma  
*A. tridactylum* Cuvier, 1827—Three-toed Amphiuma

***Aneides*** Baird, 1851—CLIMBING SALAMANDERS

- A. aeneus* (Cope and Packard, 1881)—Green Salamander  
*A. ferreus* Cope, 1869—Clouded Salamander  
*A. flavipunctatus* (Strauch, 1870)—Black Salamander

Rissler and Apodaca (2007, Syst. Biol. 56: 924–942) conclude, on the basis of mitochondrial DNA phylogeography and ecological niche modeling, that this taxon should be subdivided into two or more species. Further studies are underway.

- A. f. flavipunctatus* (Strauch, 1870)—Speckled Black Salamander  
*A. f. niger* Myers and Maslin, 1948—Santa Cruz Black Salamander  
*A. hardii* (Taylor, 1941)—Sacramento Mountains Salamander  
*A. lugubris* (Hallowell, 1849)—Arboreal Salamander  
*A. vagrans* Wake and Jackman, 1999—Wandering Salamander

***Batrachoseps*** Bonaparte, 1839—SLENDER SALAMANDERS

Jackman et al. (1997, Mol. Biol. and Evol. 14: 883–891) resurrected *Plethopsis* (Bishop, 1937, Herpetologica 1: 93–95) as one of two subgenera in *Batrachoseps* and following Wake et al. (2002, Copeia 2016–1028), *Plethopsis* includes *B. campi*, *B. robustus* and *B. wrightorum*. All remaining species are members of the nominate subgenus.

- B. altasierrae* Jockusch, Martínez-Solano, Hansen and Wake 2012—  
Greenhorn Mountains Slender Salamander.  
*B. attenuatus* (Eschscholtz, 1833)—California Slender Salamander  
*B. campi* Marlow, Brode and Wake, 1979—Inyo Mountains Salamander  
*B. bramei* Jockusch, Martínez-Solano, Hansen and Wake 2012—Fairview  
Slender Salamander.  
*B. diabolicus* Jockusch, Wake and Yanev, 1998—Hell Hollow Slender  
Salamander  
*B. gabrieli* Wake, 1996—San Gabriel Mountains Slender Salamander  
*B. gabilanensis* Jockusch, Yanev, and Wake, 2001—Gabilan Mountains  
Slender Salamander.  
*B. gregarius* Jockusch, Wake and Yanev, 1998—Gregarious Slender  
Salamander

- B. incognitus*** Jockusch, Yanev, and Wake, 2001—San Simeon Slender Salamander
- B. kawia*** Jockusch, Wake and Yanev, 1998—Sequoia Slender Salamander
- B. luciae*** Jockusch, Yanev, and Wake, 2001—Santa Lucia Mountains Slender Salamander
- B. major*** Camp, 1915—Southern California Slender Salamander  
*B. m. aridus* Brame, 1970—Desert Slender Salamander  
*B. m. major* Camp, 1915—Garden Salamander
- B. minor*** Jockusch, Yanev, and Wake, 2001—Lesser Slender Salamander.
- B. nigriventris*** Cope, 1869—Black-bellied Slender Salamander
- B. pacificus*** (Cope, 1865)—Channel Islands Slender Salamander
- B. regius*** Jockusch, Wake and Yanev, 1998—Kings River Slender Salamander
- B. relictus*** Brame and Murray, 1968—Relictual Slender Salamander
- B. robustus*** Wake, Yanev and Hansen, 2002—Kern Plateau Salamander.
- B. simatus*** Brame and Murray, 1968—Kern Canyon Slender Salamander
- B. stebbinsi*** Brame and Murray, 1968—Tehachapi Slender Salamander
- B. wrighti*** (Bishop, 1937)—Oregon Slender Salamander

***Cryptobranchus*** Leuckart, 1821—HELLBENDERS

- C. alleganiensis*** (Daudin, 1803)—Hellbender  
*C. a. alleganiensis* (Daudin, 1803)—Eastern Hellbender  
*C. a. bishopi* Grobman, 1943—Ozark Hellbender

***Desmognathus*** Baird, 1850—DUSKY SALAMANDERS

- D. abditus*** Anderson and Tilley, 2003—Cumberland Dusky Salamander
- D. aeneus*** Brown and Bishop, 1947—Seepage Salamander
- D. apalachicola*** Means and Karlin, 1989—Apalachicola Dusky Salamander
- D. auriculatus*** (Holbrook, 1838)—Southern Dusky Salamander

Divergent mitochondrial DNA lineages occur among Atlantic Coastal Plain populations that are morphologically assignable to this species. These lineages do not comprise a monophyletic unit (Beamer and Lamb, 2008, *Mol. Phylogenet. Evol.* 47:143-153).

- D. brimleyorum*** Stejneger, 1895—Ouachita Dusky Salamander
- D. carolinensis*** Dunn, 1916—Carolina Mountain Dusky Salamander
- D. conanti*** Rossman, 1958—Spotted Dusky Salamander
- D. folkertsi*** Camp, Tilley, Austin, and Marshall, 2002—Dwarf Black-bellied Salamander
- D. fuscus*** (Rafinesque, 1820)—Northern Dusky Salamander

Molecular data suggest deep differentiation among populations that morphologically resemble *D. fuscus* (Bonett, 2002, *Copeia* 2002: 344-355; Kozak, et al., 2005, *Evolution* 59: 2000-2016), and additional species almost certainly await resolution.

- D. imitator*** Dunn, 1927—Imitator Salamander
- D. marmoratus*** (Moore, 1899)—Shovel-nosed Salamander

Molecular data indicate that this taxon and *D. quadramaculatus* may not be reciprocally monophyletic (Rissler and Taylor, 2003, *Mol. Phylogenet. Evol.* 27: 197-211; Kozak, et al., 2005, *Evolution* 59: 2000-2016; Jones et al. 2006, *Mol. Phylogenet. Evol.* 38: 280-287).

- D. monticola*** Dunn, 1916—Seal Salamander
- D. ochrophaeus*** Cope, 1859—Allegheny Mountain Dusky Salamander

***D. ocoee*** Nicholls, 1949—Ocoee Salamander

This form consists of numerous parapatric units that occupy different mountain ranges in the southern Blue Ridge and Cumberland Plateau physiographic provinces and probably represent distinct species (Tilley and Mahoney, 1996, *Herpetol. Monogr.* 10: 1–42; Tilley, 1997, *J. Heredity* 88: 305–315; Highton, 2000, *in* R. C. Bruce, B. G. Jaeger and L. D. Houck [eds.], *The Biology of Plethodontid Salamanders*. Kluwer Academic/Plenum Publishers, New York, Pp. 215–241).

***D. orestes*** Tilley and Mahoney, 1996—Blue Ridge Dusky Salamander

This taxon consists of two genetically differentiated units that may represent cryptic species (Tilley and Mahoney, 1996, *Herpetol. Monogr.* 10: 1–42; Tilley, 1997, *J. Heredity* 88: 305–315; Highton, 2000, *in* R. C. Bruce, B. G. Jaeger and L. D. Houck [eds.], *The Biology of Plethodontid Salamanders*. Kluwer Academic/Plenum Publishers, New York, Pp. 215–241).

***D. organi*** Crespi, Brown, and Rissler, 2010—Northern Pygmy Salamander***D. planiceps*** Newman, 1955—Flat-headed Salamander.

Removed from synonymy under *D. fuscus* (Martof and Rose, 1962, *Copeia*, 1962: 215–216) by Tilley, Eriksen, and Katz (2008, *Zool. J. Linnean Soc.* 152:115–130).

***D. quadramaculatus*** (Holbrook, 1840)—Black-bellied Salamander

See comment under *D. marmoratus*.

***D. santeetlah*** Tilley, 1981—Santeetlah Dusky Salamander***D. welteri*** Barbour, 1950—Black Mountain Salamander***D. wrighti*** King, 1936—Pygmy Salamander***Dicamptodon*** Strauch, 1870—PACIFIC GIANT SALAMANDERS***D. aterrimus*** (Cope, 1868)—Idaho Giant Salamander***D. copei*** Nussbaum, 1970—Cope's Giant Salamander***D. ensatus*** (Eschscholtz, 1833)—California Giant Salamander***D. tenebrosus*** (Baird and Girard, 1852)—Coastal Giant Salamander***Ensatina*** Gray, 1850—ENSATINAS***E. eschscholtzii*** Gray, 1850—Ensatina

The taxonomy of this complex is controversial. Some authors would recognize from two (e.g., Frost and Hillis, 1990, *Herpetologica* 46: 87–104) to as many as 11 or more species (e.g., Highton, 1998, *Herpetologica* 54: 254–278), whereas others (e.g., Wake, 1997, *Proc. Natl. Acad. Sci. USA*, 94: 7761–7767; Wake and Schneider, 1998, *Herpetologica* 54: 279–298; Pereira and Wake, 2009, *Evolution* 68: 2288–2301) consider evidence for evolutionary independence of segments of the complex to be inadequate or equivocal. Narrow hybrid zones have been demonstrated to exist between populations assigned to the subspecies *xanthoptica* and *platensis*, and between *klauberi* and *eschscholtzii*, and one site of sympatry with no hybridization between the latter pair has been reported (Wake et al., 1989, *in* D. Otte and J. A. Endler, [eds.], *Speciation and its Consequences*, Sinauer, Pp. 134–157). Broader zones of genetic admixture and reticulation between units of the complex in many areas raise questions about evolutionary independence, and borders of taxa are elusive.

***E. e. croceater*** (Cope, 1868)—Yellow-blotched Ensatina***E. e. eschscholtzii*** Gray, 1850—Monterey Ensatina***E. e. klauberi*** Dunn, 1929—Large-blotched Ensatina***E. e. oregonensis*** (Girard, 1856)—Oregon Ensatina

- E. e. picta* Wood, 1940—Painted Ensatina  
*E. e. platensis* (Jimenez de al Espada, 1875)—Sierra Nevada Ensatina  
*E. e. xanthoptica* Stebbins, 1949—Yellow-eyed Ensatina

***Eurycea*** Rafinesque, 1822—BROOK SALAMANDERS

- E. aquatica* Rose and Bush, 1963—Brown-backed Salamander  
*E. bislineata* (Green, 1818)—Northern Two-lined Salamander  
*E. chamberlaini* Harrison and Guttman, 2003—Chamberlain's Dwarf Salamander  
*E. chisholmensis* Chippindale, Price, Wiens, and Hillis, 2000—Salado Salamander  
*E. cirrigera* (Green, 1831)—Southern Two-lined Salamander  
*E. guttolineata* (Holbrook, 1838)—Three-lined Salamander  
*E. junaluska* Sever, Dundee and Sullivan, 1976—Junaluska Salamander  
*E. latitans* Smith and Potter, 1946—Cascade Caverns Salamander  
*E. longicauda* (Green, 1818)—Long-tailed Salamander  
*E. l. longicauda* (Green, 1818)—Ezstern Long-tailed Salamander  
*E. l. melanopleura* (Cope, 1894)—Dark-sided Salamander  
*E. lucifuga* Rafinesque, 1822—Cave Salamander  
*E. multiplicata* (Cope, 1869)—Many-ribbed Salamander

Formerly subdivided into the subspecies *E. m. griseogaster* and *E. m. multiplicata*. Biochemical data indicate that populations assigned to *E. m. griseogaster* are conspecific with *E. tynerensis*, while those of the nominate subspecies fall into two or three divergent clades that may represent distinct species (Bonett and Chippindale, 2004, Mol. Ecol. 13: 1189–1203).

- E. nana* Bishop, 1941—San Marcos Salamander  
*E. naufragia* Chippindale, Price, Wiens, and Hillis, 2000—Georgetown Salamander  
*E. neotenes* Bishop and Wright, 1937—Texas Salamander  
*E. pterophila* Burger, Smith, and Potter, 1950—Fern Bank Salamander  
*E. quadridigitata* (Holbrook, 1842)—Dwarf Salamander  
*E. rathbuni* (Stejneger, 1896)—Texas Blind Salamander  
*E. robusta* (Longley, 1978)—Blanco Blind Salamander  
*E. sosorum* Chippindale, Price and Hillis, 1993—Barton Springs Salamander  
*E. spelaea* Stejneger, 1892—Grotto Salamander  
*E. tonkawae* Chippindale, Price, Wiens, and Hillis, 2000—Jollyville Plateau Salamander  
*E. tridentifera* Mitchell and Reddell, 1965—Comal Blind Salamander  
*E. troglodytes* Baker, 1957—Valdina Farms Salamander.  
*E. tynerensis* Moore and Hughes, 1939—Oklahoma Salamander  
*E. waterlooensis* Hillis, Chamberlain, Wilcox and Chippindale, 2001—Austin Blind Salamander  
*E. wilderae* Dunn, 1920—Blue Ridge Two-lined Salamander

**Gyrinophilus** Cope, 1869—SPRING SALAMANDERS

**G. gulolineatus** Brandon, 1965—Berry Cave Salamander  
Niemiller, et al. (2008, *Molec. Ecol.* 17: 2258-2275) provide molecular evidence indicating that this form and *G. pallucus* have diverged very recently from *G. porphyriticus* and are phylogenetically nested within populations referred to that species.

**G. pallucus** McCrady, 1954—Tennessee Cave Salamander  
See comment under *G. gulolineatus*.

*G. p. necturoides* Lazell and Brandon, 1962—Big Mouth Cave Salamander

*G. p. pallucus* McCrady, 1954—Pale Salamander

**G. porphyriticus** (Green, 1827)—Spring Salamander

*G. p. danielsi* (Blatchley, 1901)—Blue Ridge Spring Salamander

*G. p. dunni* Mittleman and Jopson, 1941—Carolina Spring Salamander

*G. p. duryi* (Weller, 1930)—Kentucky Spring Salamander

*G. p. porphyriticus* (Green, 1827)—Northern Spring Salamander

**G. subterraneus** Besharse and Holsinger, 1977—West Virginia Spring Salamander

**Haideotriton** Carr, 1939—GEORGIA BLIND SALAMANDERS

Considered a junior synonym of *Eurycea* by Dubois (2005, *Alytes* 23: 20). Frost et al. (2006, *Bull. Am. Mus. Nat. Hist.* 297) argue that recognition of this morphologically distinctive taxon renders *Eurycea* paraphyletic, but present no data. Pyron and Wiens (2011, *Mol. Phylogenet. Evol.* 61: 543-583) show the taxon nested within *Eurycea* based on partial cyt b sequences, but support levels are weak and available data cannot reject the hypothesis that *Haideotriton* is the sister taxon of *Eurycea*. We continue to recognize *Haideotriton*.

**H. wallacei** Carr, 1939—Georgia Blind Salamander

**Hemidactylium** Tschudi, 1838—FOUR-TOED SALAMANDERS

**H. scutatatum** (Temminck and Schlegel in Von Siebold, 1838)—Four-toed Salamander

**Hydromantes** Gistel, 1848—WEB-TOED SALAMANDERS

**H. brunus** Gorman, 1954—Limestone Salamander

**H. platycephalus** (Camp, 1916)—Mount Lyell Salamander

**H. shastae** Gorman and Camp, 1953—Shasta Salamander

**Necturus** Rafinesque, 1819—WATERDOGS and MUDPUPPIES

**N. alabamensis** Viosca, 1937—Black Warrior River Waterdog

**N. beyeri** Viosca, 1937—Gulf Coast Waterdog

According to Bart et al. (1997, *J. Herpetol.* 31: 192–201) this taxon may consist of more than one species.

**N. lewisi** Brimley, 1924—Neuse River Waterdog

**N. maculosus** (Rafinesque, 1818)—Mudpuppy

*N. m. maculosus* (Rafinesque, 1818)—Common Mudpuppy

*N. m. louisianensis* Viosca, 1938—Red River Mudpuppy

**N. punctatus** (Gibbes, 1850)—Dwarf Waterdog



***Notophthalmus*** Rafinesque, 1820—EASTERN NEWTS***N. meridionalis*** (Cope, 1880)—Black-spotted Newt*N. m. meridionalis* (Cope, 1880)—Texas Black-spotted Newt***N. perstriatus*** (Bishop, 1941)—Striped Newt***N. viridescens*** (Rafinesque, 1820)—Eastern Newt*N. v. dorsalis* (Harlan, 1828)—Broken-striped Newt*N. v. louisianensis* (Wolterstorff, 1914)—Central Newt*N. v. piaropicola* (Schwartz and Duellman, 1952)—Peninsula Newt*N. v. viridescens* (Rafinesque, 1820)—Red-spotted Newt***Phaeognathus*** Highton, 1961—RED HILLS SALAMANDERS***P. hubrichti*** Highton, 1961—Red Hills Salamander***Plethodon*** Tschudi, 1838—WOODLAND SALAMANDERS

Mitochondrial and nuclear sequence data consistently support the monophyly of *Plethodon*. Deep divergence between western and eastern species led Vieites et al. (2011, Mol. Phylogenet. Evol. 59: 623-635) to name a new subgenus, *Hightonia*, including *P. asupak*, *P. dunni*, *P. elongatus*, *P. idahoensis*, *P. larselli*, *P. neomexicanus*, *P. stormi*, *P. vandykei* and *P. vehiculum*. All remaining species are assigned to the nominate subgenus.

***P. ainsworthi*** Lazell, 1998—Bay Springs Salamander***P. albagula*** Grobman, 1944—Western Slimy Salamander

There is molecular and morphological evidence for distinct evolutionary lineages within this taxon (Baird et al., 2006, Copeia 2006: 760–768; Davis and Pauly, 2011, Copeia 2011: 103-112).

***P. amplus*** Highton and Peabody, 2000—Blue Ridge Gray-cheeked Salamander***P. angusticlavius*** Grobman, 1944—Ozark Zigzag Salamander***P. asupak*** Mead, Clayton, Nauman, Olson and Pfrender, 2005—Scott Bar Salamander***P. aureolus*** Highton, 1984—Tellico Salamander***P. caddoensis*** Pope and Pope, 1951—Caddo Mountain Salamander***P. chattahoochee*** Highton, 1989—Chattahoochee Slimy Salamander***P. cheoah*** Highton and Peabody, 2000—Cheoah Bald Salamander***P. chlorobryonis*** Mittleman, 1951—Atlantic Coast Slimy Salamander***P. cinereus*** (Green, 1818)—Eastern Red-backed Salamander***P. cylindraceus*** (Harlan, 1825)—White-spotted Slimy Salamander***P. dorsalis*** Cope, 1889—Northern Zigzag Salamander***P. dunni*** Bishop, 1934—Dunn’s Salamander***P. electromorphus*** Highton, 1999—Northern Ravine Salamander***P. elongatus*** Van Denburgh, 1916—Del Norte Salamander***P. fourchensis*** Duncan and Highton, 1979—Fourche Mountain Salamander***P. glutinosus*** (Green, 1818)—Northern Slimy Salamander***P. grobmani*** Allen and Neill, 1949—Southeastern Slimy Salamander***P. hoffmani*** Highton, 1972—Valley and Ridge Salamander***P. hubrichti*** Thurow, 1957—Peaks of Otter Salamander***P. idahoensis*** Slater and Slipp, 1940—Coeur d’Alene Salamander

- P. jordani* Blatchley, 1901—Red-cheeked Salamander  
*P. kentucki* Mittleman, 1951—Cumberland Plateau Salamander  
*P. kiamichi* Highton, 1989—Kiamichi Slimy Salamander  
*P. kisatchie* Highton, 1989—Louisiana Slimy Salamander  
*P. larselli* Burns, 1954—Larch Mountain Salamander  
*P. meridianus* Highton and Peabody, 2000—South Mountain Gray-cheeked Salamander  
*P. metcalfi* Brimley, 1912—Southern Gray-cheeked Salamander  
*P. mississippi* Highton, 1989—Mississippi Slimy Salamander  
*P. montanus* Highton and Peabody, 2000—Northern Gray-cheeked Salamander  
*P. neomexicanus* Stebbins and Riemer, 1950—Jemez Mountains Salamander  
*P. nettingi* Green, 1938—Cheat Mountain Salamander  
*P. ocmulgee* Highton, 1989—Ocmulgee Slimy Salamander  
*P. ouachitae* Dunn and Heinze, 1933—Rich Mountain Salamander  
*P. petraeus* Wynn, Highton and Jacobs, 1988—Pigeon Mountain Salamander  
*P. punctatus* Highton, 1972—Cow Knob Salamander  
*P. richmondi* Netting and Mittleman, 1938—Southern Ravine Salamander  
*P. savannah* Highton, 1989—Savannah Slimy Salamander  
*P. sequoyah* Highton, 1989—Sequoyah Slimy Salamander  
*P. serratus* Grobman, 1944—Southern Red-backed Salamander  
*P. shenandoah* Highton and Worthington, 1967—Shenandoah Salamander  
*P. sherando* Highton, 2004—Big Levels Salamander  
*P. shermani* Stejneger, 1906—Red-legged Salamander  
*P. stormi* Highton and Brame, 1965—Siskiyou Mountains Salamander  
*P. teyahalee* Hairston, 1950—Southern Appalachian Salamander  
*P. vandykei* Van Denburgh, 1906—Van Dyke's Salamander  
*P. variolatus* (Gilliams, 1818)—South Carolina Slimy Salamander  
*P. vehiculum* (Cooper, 1860)—Western Red-backed Salamander  
*P. ventralis* Highton, 1997—Southern Zigzag Salamander  
*P. virginia* Highton, 1999—Shenandoah Mountain Salamander  
*P. websteri* Highton, 1979—Webster's Salamander  
*P. wehrlei* Fowler and Dunn, 1917—Wehrle's Salamander  
*P. welleri* Walker, 1931—Weller's Salamander  
*P. yonahlossee* Dunn, 1917—Yonahlossee Salamander

***Pseudobranchius* Gray, 1825—DWARF SIRENS**

- P. axanthus* Netting and Goin, 1942—Southern Dwarf Siren  
*P. a. axanthus* Netting and Goin, 1942—Narrow-striped Dwarf Siren  
*P. a. belli* Schwartz, 1952—Everglades Dwarf Siren  
*P. striatus* (LeConte, 1824)—Northern Dwarf Siren  
*P. s. lustricolus* Neill, 1951—Gulf Hammock Dwarf Siren  
*P. s. spheniscus* Goin and Crenshaw, 1949—Slender Dwarf Siren  
*P. s. striatus* (LeConte, 1824)—Broad-striped Dwarf Siren

***Pseudotriton*** Tschudi, 1838—RED and MUD SALAMANDERS***P. montanus*** Baird, 1850—Mud Salamander*P. m. diastictus* Bishop, 1941—Midland Mud Salamander*P. m. flavissimus* Hallowell, 1856—Gulf Coast Mud Salamander*P. m. floridanus* Netting and Goin, 1942—Rusty Mud Salamander*P. m. montanus* Baird, 1850—Eastern Mud Salamander***P. ruber*** (Sonnini de Manoncourt and Latreille, 1801)—Red Salamander*P. r. nitidus* Dunn, 1920—Blue Ridge Red Salamander*P. r. ruber* (Latreille, 1801)—Northern Red Salamander*P. r. schencki* (Brimley, 1912)—Black-chinned Red Salamander*P. r. vioscai* Bishop, 1928—Southern Red Salamander***Rhyacotriton*** Dunn, 1920—TORRENT SALAMANDERS***R. cascadae*** Good and Wake, 1992—Cascade Torrent Salamander***R. kezeri*** Good and Wake, 1992—Columbia Torrent Salamander***R. olympicus*** (Gauge, 1917)—Olympic Torrent Salamander***R. variegatus*** Stebbins and Lowe, 1951—Southern Torrent Salamander***Siren*** Österdam, 1766—SIRENS***S. intermedia*** Barnes, 1826—Lesser Siren*S. i. texana* was synonymized with *S. intermedia nettingi* by Flores-Villela and Brandon (1992, Ann. Carnegie Mus. 61: 289–291). The status of the remaining subspecies remains unclear and deserves careful evaluation.*S. i. intermedia* Barnes, 1826—Eastern Lesser Siren*S. i. nettingi* Goin, 1942—Western Lesser Siren***S. lacertina*** Österdam, 1766—Greater Siren

The status of the two distantly allopatric populations (see Flores-Villela and Brandon, 1992, Ann. Carnegie Mus. 61: 289–291) in (1) south Texas and adjacent Mexico and (2) peninsular Florida is unclear and deserves evaluation.

***Stereochilus*** Cope, 1869—MANY-LINED SALAMANDERS***S. marginatus*** (Hallowell, 1856)—Many-lined Salamander***Taricha*** Gray, 1850—PACIFIC NEWTS***T. granulosa*** (Skilton, 1849)—Rough-skinned Newt***T. rivularis*** (Twitty, 1935)—Red-bellied Newt***T. sierrae*** (Twitty, 1942)—Sierra NewtFormerly considered a subspecies of *T. torosa*; elevated to species status by Kuchta (2007, Herpetologica 63: 332–350).***T. torosa*** (Rathke, in Eschscholtz, 1833)—California Newt***Urspelerpes*** Camp, Peterman, Milanovich, Lamb, Maerz, and Wake, 2009—  
PATCH-NOSED SALAMANDERS***U. brucei*** Camp, Peterman, Milanovich, Lamb, Maerz, and Wake,  
2009—Patch-nosed salamander.

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 Squamata — Lizards
 

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**Anniella** Gray, 1852—North American Legless Lizards

Taxonomy for *Anniella* follows Hunt (1983, *Copeia* 1983: 79–89), with nomenclatural modifications (ICZN, 1993, *Bull. Zool. Nomencl.* 50: 186–187) and elimination of subspecies (de Queiroz et al., 2003, pages 198–201 in Crother et al., 2003, *Herp. Review* 34:196–203) based on the data of Pearse and Pogson (2000, *Evolution* 54: 1041–1046).

**A. pulchra** Gray, 1852—California Legless Lizard

Parham and Papenfuss (2009, *Conserv. Genet.* 10:169–179) presented evidence from mitochondrial and nuclear DNA sequences for the existence of five lineages within *Anniella pulchra* that are, or were historically, evolving separately. The members of some of those lineages differ in coloration, and those of others differ in karyotype. Ongoing studies by the same authors are aimed at clarifying the systematics of the five lineages.

**Anolis** Daudin, 1802—ANOLES

Taxonomy for *Anolis* follows Williams (1976, *Breviora* 440: 1–21) with addition of subspecies from Schwartz and Henderson (1991, *Amphibians and Reptiles of the West Indies*, University of Florida Press) and modifications by Vance (1991, *Bull. Maryland Herpetol. Soc.* 27: 43–89; description of *A. carolinensis seminolus*). Some authors (e.g., Guyer and Savage, 1986, *Syst. Zool.* 35: 509–531; 1992, *Syst. Biol.* 41: 89–110; Savage and Guyer, 1989, *Amphibia-Reptilia* 10: 105–116) divide *Anolis* into the following five genera: *Anolis*, *Ctenonotus*, *Dactyloa*, *Norops*, and *Xiphosurus* (= *Semiurus*); however, according to the analysis of Poe (2004, *Herpetol. Monogr.* 18: 37–89), only *Norops* is monophyletic among these five taxa. Other authors (e.g., Nicholson, 2002, *Herpetol. Monogr.* 16: 93–120; Brandley and de Queiroz, 2004, *Herpetol. Monogr.* 18: 90–126; Castañeda and de Queiroz, in press, *Mol. Phylogenet. Evol.*) have used the name *Anolis* for the more inclusive clade, applying the other names to various *Anolis* subclades (sometimes with different circumscriptions). We have included names of subclades parenthetically, where applicable.

**A. carolinensis** (Voigt, 1832)—Green Anole

*A. c. carolinensis* (Voigt, 1832)—Northern Green Anole

*A. c. seminolus* Vance, 1991—Southern Green Anole

**A. (Ctenonotus) distichus** Cope, 1861—Bark Anole

The potential natural occurrence of *A. (Ctenonotus) distichus* in Florida is an unresolved issue. Current populations show evidence of hybridization between introduced *A. d. dominicensis* and another form (see note on *A. distichus* in the section on alien species), but the origin of the other form is currently unknown. Smith and McCauley (1948, *Proc. Biol. Soc. Washington* 61: 159–166) named it as the subspecies *A. d. floridanus* based on differences from the Bahamian and Hispaniolan specimens. Schwartz (1968, *Bull. Mus. Comp. Zool.* 137: 255–310) reviewed morphological variation in *A. distichus* and con

firmed differences between Floridian versus Bahamian and Hispaniolan populations. He considered *A. d. floridanus* to have colonized Florida recently, either by natural dispersal or human introduction, and that the Bimini chain (*A. d. biminiensis*) and Andros Island (*A. d. distichoides*) represented the most likely sources. A detailed study of genetic variation in *A. distichus*, similar to that done for *A. sagrei* (Kolbe et al., 2004, Nature 431: 177-181) and including the introduced populations, would help to clarify this issue.

*A. (C.) d. floridanus* Smith and McCauley, 1948—Florida Bark Anole

***Aspidoscelis*** Fitzinger, 1843—WHIPTAILS

Taxonomy for *Aspidoscelis* follows Maslin and Secoy (1986, Contrib. Zool. Univ. Colorado Mus. 1: 1–60) and Wright (1993, in J. W. Wright and L. J. Vitt [eds.], Biology of Whiptail Lizards [Genus *Cnemidophorus*], Oklahoma Mus. Nat. Hist., Pp. 27–81) with modifications by Camp (1916, Univ. California Pub. Zool. 17: 63–74; proposal of *A. t. munda* as a replacement name for the invalid name *A. (t.) undulata* Hallowell 1854), Maslin and Walker (1981, Am. Midl. Nat. 105: 84–92; treatment of *A. t. stejnegeri* as the name of the subspecies of *A. tigris* occurring in coastal southern California), Collins (1991, Herpetol. Rev. 22: 42–43; treatment of *A. xanthonota* as a separate species from *A. burti*), Dessauer and Cole (1991, Copeia 1991: 622–637; recognition of *A. marmorata (tigris) reticuloriens*), Trauth (1992, Texas J. Sci. 44: 437–443; description of *A. sexlineata stephensae*), Wright and Lowe (1993, J. Arizona-Nevada Acad. Sci. 27: 129–157; descriptions of *A. inornatus gypsi*, *A. i. junipera*, *A. i. llanuras*, and *A. i. pai*), Trauth (1995, Bull. Chicago Herpetol. Soc. 30: 68; spelling of *A. sexlineata stephensae*), Smith et al. (1996, Herpetol. Rev. 27: 129; priority of the names *A. scalaris* and *A. semifasciata* over *A. septemvittata* and *A. sericea* and precedence of *A. scalaris* over *A. semifasciata* and *A. septemvittata* over *A. sericea*), Taylor and Walker (1996, Copeia 1996: 140–148; synonymy of *A. t. gracilis* with *A. t. tigris*, and use of the name *A. t. punctilinealis* for the taxon formerly called *A. t. gracilis*), Walker et al. (1997, Herpetologica 53: 233–259; restriction of the name *A. tessellata* to the diploid members of the species formerly referred to by that name and recognition of the species *A. neotesselata* for the triploid members), Collins (1997, SSAR Herpetol. Circ. 25; recognition of *A. arizonae* and *A. pai* [but not *A. gypsi*] as species); ICZN (1999, Bull. Zool. Nomencl. 56: 162–163) precedence of the name *A. neomexicana* over *A. perplexa*; Reeder et al. (2002, Am. Mus. Novit. 3365: 1–61; use of *Aspidoscelis* for a clade containing all of the whiptail species native to North America), and those described in additional notes below. Maslin and Secoy (op. cit.) and Wright (op. cit.) are the sources for information on reproductive mode. A tetraploid parthenogenetic species of *Aspidoscelis* has been generated in the laboratory by hybridization of *A. exanguis* and *A. inornata* (Lutes et al., 2011, Proc. Natl. Acad. Sci. USA 108: 9910-9915), but it has not been named.

*A. arizonae* (Van Denburgh, 1896)—Arizona Striped Whiptail

See note on *A. inornata* concerning recognition of *A. arizonae* as a separate species.

*A. exanguis* (Lowe, 1956)—Chihuahuan Spotted Whiptail (unisexual)

*A. flagellicauda* (Lowe and Wright, 1964)—Gila Spotted Whiptail (unisexual)

*A. gularis* (Baird and Girard, 1852)—Common Spotted Whiptail

See comment under *A. scalaris*.

*A. g. gularis* (Baird and Girard, 1852)—Texas Spotted Whiptail

*A. hyperythra* (Cope, 1863)—Orange-throated Whiptail

*A. h. beldingi* (Stejneger, 1894)—Belding's Orange-throated Whiptail

According to previous taxonomies (e.g., Maslin and Secoy, 1986, *Contrib. Zool. Univ. Colorado Mus.* 1: 1–60; Wright, 1993, in J. W. Wright and L. J. Vitt [eds.], *Biology of Whiptail Lizards [Genus *Cnemidophorus*]*, *Oklahoma Mus. Nat. Hist.*, Pp. 27–81), the subspecies *Aspidoscelis hyperythra beldingi* occurs in the United States. Grismer (1999, *Herpetologica* 55: 28–42) did not recognize subspecies of *A. hyperythra*; however, his decision seems to have been based at least partly on a philosophical opposition to the recognition of subspecies, though he also stated that Welsh (1988, *Proc. California Acad. Sci.* 46: 1–72) had previously synonymized the names *A. h. beldingi* and *A. h. schmidti* with *A. h. hyperythra*. In reality, Welsh (op. cit.) did not formally synonymize any of the names in question. Instead, he suggested that differentiation was insufficient to warrant the recognition of three distinct races (which he nevertheless recognized) and that central Baja California was an area of intergradation between *A. h. beldingi* and *A. h. hyperythra*. He also referred specimens from the Sierra San Pedro Mártir region to *A. h. schmidti*. If *A. h. schmidti* represents the intergrading populations, then this form extends from the northern Sierra San Pedro Mártir region (30°58'N; Welsh, op. cit.) to San Ignacio (27°17'N; Linsdale, 1932, *Univ. California Pub. Zool.* 38: 345–386), which is roughly one-third of the total range of the species (see Grismer, op. cit.). Given such an extensive area of intergradation, it seems reasonable to interpret the previously recognized taxa as morphotypes rather than subspecies. On the other hand, Wright (1994, in P. R. Brown and J. W. Wright [eds.], *Herpetology of the North American Deserts, Southwestern Herpetologists Society*, Pp. 255–271) had previously identified a diagnostic color pattern difference between *A. h. hyperythra* and *A. h. beldingi* (he considered *A. h. schmidti* a synonym of *A. h. beldingi*) and placed the zone of intergradation between the two subspecies in southern Baja California (see also Thompson et al., 1998, *Cat. Am. Amph. Rept.* 655). Grismer (op. cit.) did not address this difference, and we have therefore retained the two subspecies.

***A. inornata*** (Baird, 1859 “1858”)—Little Striped Whiptail  
Wright and Lowe (1993, *J. Arizona-Nevada Acad. Sci.* 27: 129–157) recognized six subspecies of *Aspidoscelis inornata* in the United States. Collins (1997, *SSAR Herpetol. Circ.* 25), treated three of them, *arizonae*, *gypsi*, and *pai*, as separate species (but see note on *A. i. gypsi*), presumably because they are geographically separated and morphologically distinguishable both from one another and from the other subspecies of *A. inornata* recognized by Wright and Lowe (op. cit.).

*A. i. gypsi* (Wright and Lowe, 1993)—Little White Whiptail  
Rosenblum and Harmon (2010, *Evolution* 65: 946–960), in a study based on nuclear and mitochondrial DNA, coloration, and body size and proportions, concluded that although whiptails from the gypsum sands had diverged more from their dark soil counterparts in terms of body size and shape than sympatric earless and fence lizards (see notes on *Holbrookia maculata ruthveni* and *Sceloporus cowlesi*), the genetic data indicate that the whiptails are failing to speciate. This conclusion suggests that it is more appropriate to recognize the taxon not as a species (as proposed by Collins, 1997, *SSAR Herpetol. Circ.* 25) but as a subspecies of *A. inornata* (as originally proposed by Wright and Lowe, 1993, *J. Arizona-Nevada Acad. Sci.* 27: 129–157).

*A. i. heptagramma* (Axtell, 1961)—Trans-Pecos Striped Whiptail  
Based on a highly variable sample of *Aspidoscelis inornata heptagramma* from Chihuahua, Walker et al. (1996, *J. Herpetol.* 30: 271–275) questioned the usefulness of this taxon for describing variation within *A. inornata*.

*A. i. junipera* (Wright and Lowe, 1993)—Woodland Striped Whiptail  
Walker et al. (1996, *J. Herpetol.* 30: 271–275) called into question some of the characters used by Wright and Lowe (1993, *J. Arizona-Nevada Acad. Sci.* 27: 129–157) to separate *Aspidoscelis inornata junipera* from *A. i. heptagramma* but did not explicitly treat the names as synonyms.

*A. i. llanuras* (Wright and Lowe, 1993)—Plains Striped Whiptail  
Walker et al. (1996, *J. Herpetol.* 30: 271–275) called into question some of the characters used by Wright and Lowe (1993, *J. Arizona-Nevada Acad. Sci.* 27: 129–157) to separate *Aspidoscelis inornata llanuras* from *A. i. heptagramma* but did not explicitly treat the names as synonyms.

*A. laredoensis* (McKinney, Kay and Anderson, 1973)—Laredo Striped Whiptail (unisexual)  
Abuhteba et al. (2001, *Copeia* 2001: 262–266) interpreted histoincompatibility between the members of two pattern classes within *Aspidoscelis laredoensis* as evidence for separate hybrid origins of the corresponding clones. The authors noted that two of them are planning to restrict the name *A. laredoensis* to one of the clones and propose a new species name for the other.

*A. marmorata* (Baird and Girard, 1852)—Marbled Whiptail  
Dessauer and Cole (1991, *Copeia* 1991: 622–637; see also Dessauer et al., 2000, *Bull. Am. Mus. Nat. Hist.* 246: 1–148) presented evidence of both differentiation and interbreeding between *A. marmorata* and *A. tigris* along a transect near the southern part of the border between Arizona and New Mexico, including a narrow (3 km) hybrid zone in which hybrid indices based on color patterns and allele frequencies changed abruptly in concordant step clines. Although those authors interpreted their data as reflecting incomplete speciation between the two forms (i.e., a single species), the same data can be interpreted alternatively as reflecting largely separate gene pools (i.e., two species). Following the terminology of de Queiroz (1998, in D. J. Howard and S. H. Berlocher [eds.], *Endless Forms: Species and Speciation*, Oxford University Press, Pp. 57–75), they are here considered incompletely separated species.

*A. m. marmorata* (Baird and Girard, 1852)—Western Marbled Whiptail

*A. m. reticuloriens* (Vance, 1978)—Eastern Marbled Whiptail

See note on *A. tessellata* concerning hybridization between that species and *A. m. reticuloriens*.

*A. neomexicana* (Lowe and Zweifel, 1952)—New Mexico Whiptail (unisexual)

Manning et al. (2005, *Am. Mus. Novit.* 3492: 1–56) presented evidence for hybridization between *A. neomexicana* and *A. sexlineatus viridis*, but there is no indication either that this hybridization has produced a new hybrid species or that it is leading to the fusion of the two hybridizing species.

*A. neotesselata* (Walker, Cordes and Taylor, 1997)—Colorado Checkered Whiptail (unisexual)

*A. pai* (Wright and Lowe, 1993)—Pai Striped Whiptail

See note on *A. inornata* concerning recognition of *A. pai* as a separate species.

*A. scalaris* (Cope, 1892)—Plateau Spotted Whiptail

*Aspidoscelis scalaris* (as *A. septemvittata*) was treated as a subspecies of *A. gularis* by Maslin and Secoy (1986, *Contrib. Zool. Univ. Colorado Mus.* 1: 1–60) but as a species by Wright (1993, in J. W. Wright and L. J. Vitt [eds.], *Biology of Whiptail Lizards [Genus Cnemidophorus]*, Oklahoma Mus. Nat. Hist., Pp. 27–81).

*A. s. septemvittata* (Cope, 1892)—Big Bend Spotted Whiptail

***A. sexlineata*** (Linnaeus, 1766)—Six-lined Racerunner*A. s. sexlineata* (Linnaeus, 1766)—Eastern Six-lined Racerunner*A. s. stephensae* (Trauth, 1992)—Texas Yellow-headed Racerunner*A. s. viridis* (Lowe, 1966)—Prairie Racerunner

See note on *A. neomexicana* concerning hybridization between that species and *A. s. viridis*.

***A. sonora*** (Lowe and Wright, 1964)—Sonoran Spotted Whiptail  
(unisexual)

***A. stictogramma*** (Burger, 1950)—Giant Spotted Whiptail

Based on differences in body size, scutellation, and color patterns, Walker and Cordes (2011, *Herp. Review* 42: 33–39) inferred that *A. stictogramma* (formerly *A. burti stictogramma*) is a separate species from *A. burti*.

***A. tessellata*** (Say, in James, 1823)—Common Checkered Whiptail  
(unisexual)

*Aspidoscelis dixonii* was recognized as a species by Wright (1993, in J. W. Wright and L. J. Vitt [eds.], *Biology of Whiptail Lizards [Genus Cnemidophorus]*, Oklahoma Mus. Nat. Hist., Pp. 27–81) and Walker et al. (1994, *Texas J. Sci.* 46: 27–33) because its origin was thought to have resulted from a separate hybridization event than the one involved in the origin of the clone represented by the type of *A. tessellata*. However, Cordes and Walker (2006, *Copeia* 2006: 14–26) presented evidence in the form of skin-graft histocompatibility that *A. dixonii* and *A. tessellata* resulted from a single hybridization event. We have therefore treated the name *A. dixonii* as a synonym of *A. tessellata* following Maslin and Secoy (1986, *Contrib. Zool. Univ. Colorado Mus.* 1: 1–60). Taylor et al. (2001, *Am. Mus. Novit.* 3345: 1–65) presented evidence for hybridization between *A. tessellata* and *A. marmorata*, but there is no indication that this hybridization has produced a new hybrid species. Cole et al. (2007, *Am. Mus. Novit.* 3555: 1–31) presented evidence for hybridization between *A. tessellata* (one of the pattern classes formerly recognized as *A. dixonii*) and *A. tigris punctilinealis* and hypothesized that it may be negatively impacting the former taxon.

***A. tigris*** (Baird and Girard, 1852)—Tiger Whiptail*A. t. munda* (Camp, 1916)—California Whiptail*A. t. punctilinealis* (Dickerson, 1919)—Sonoran Tiger Whiptail

See note on *A. tessellata* concerning hybridization between that species and *A. t. punctilinealis*.

*A. t. septentrionalis* (Burger, 1950)—Plateau Tiger Whiptail*A. t. stejnegeri* (Van Denburgh, 1894)—San Diegan Tiger Whiptail*A. t. tigris* (Baird and Girard, 1852)—Great Basin Whiptail

***A. uniparens*** (Wright and Lowe, 1965)—Desert Grassland Whiptail  
(unisexual)

***A. velox*** (Springer, 1928)—Plateau Striped Whiptail (unisexual)

Maslin and Secoy (1986, *Contrib. Zool. Univ. Colorado Mus.* 1: 1–60) treated the name *Aspidoscelis (sackii) innotata* as a synonym of *A. velox*, but Wright (1993, in J. W. Wright and L. J. Vitt [eds.], *Biology of Whiptail Lizards [Genus Cnemidophorus]*, Oklahoma Mus. Nat. Hist., Pp. 27–81) applied the name *A. velox* to populations of triploid parthenogens and treated *A. innotata* as the name of a separate diploid species.

Cuellar (1977, *Evolution* 31: 24–31) found histoincompatibility (rejection of skin grafts) between *A. velox*-like lizards from Colorado, New Mexico, and Utah, which Cuellar and Wright (1992, *C. R. Soc. Biogeogr.* 68: 157–160) interpreted as potential evidence for



different ploidy levels. The type locality of *A. velox* is in Arizona, while that of *A. innotata* is in Utah, and lizards from New Mexico are known to be triploid (Neaves, 1969, J. Exper. Zool. 171: 175–184; Dessauer and Cole, 1989, in R. M. Dawley and J. P. Bogart [eds.], Evolution and Ecology of Unisexual Vertebrates, New York State Museum, Pp. 49–71). If lizards from the type locality of *A. innotata* turn out to be diploid, it would be reasonable to recognize a separate diploid species and apply the name *A. innotata* (Plateau Unspotted Whiptail) to it.

*A. xanthonota* (Duellman and Lowe 1953)—Red-backed Whiptail

### ***Callisaurus*** Blainville, 1835—ZEBRA-TAILED LIZARDS

Taxonomy for *Callisaurus* follows de Queiroz (1989, Ph.D. dissertation, Univ. California, Berkeley).

*C. draconoides* Blainville, 1835—Zebra-tailed Lizard

Two recent molecular phylogeographic studies shed some preliminary light on the relationships and status of the three U.S. subspecies of *C. draconoides*. Based on mitochondrial DNA (mtDNA), Lindell et al. (2005, Mol. Phylogenet. Evol. 36: 682–694) found that both *C. d. myurus* and *C. d. ventralis* are nested within *C. d. rhodostictus*, *C. d. ventralis* deeply so; however, both *C. d. myurus* and *C. d. ventralis* were represented by small samples, and there were large geographic gaps between these samples and those representing *C. d. rhodostictus*. Blaine (2008, Ph.D. dissertation, Washington Univ.) found that samples from the Mojave Desert and the Great Basin formed a mtDNA haplotype clade, as did those from the U.S. Sonoran Desert, but he had few samples from Baja California and none from the Mexican mainland. The status of the subspecies of *C. draconoides* deserves further study.

*C. d. myurus* Richardson, 1915—Northern Zebra-tailed Lizard

*C. d. rhodostictus* Cope, 1896—Western Zebra-tailed Lizard

*C. d. ventralis* (Hallowell, 1852)—Eastern Zebra-tailed Lizard

Cnemidophorus: See *Aspidoscelis* in *Squamata — Lizards* and “*Cnemidophrous*” in *Alien Species*.

### ***Coleonyx*** Gray, 1845—BANDED GECKOS

Taxonomy for *Coleonyx* follows Grismer (1988, in Phylogenetic Relationships of the Lizard Families, R. Estes and G. Pregill [eds.], Stanford Univ. Press, Pp. 369–469).

*C. brevis* Stejneger, 1893—Texas Banded Gecko

*C. reticulatus* Davis and Dixon, 1958—Reticulate Banded Gecko

*C. switaki* (Murphy, 1974)—Switak’s Banded Gecko

*C. s. switaki* (Murphy, 1974)—Peninsula Banded Gecko

*C. variegatus* (Baird, 1859 “1858”)—Western Banded Gecko

Grismer (2002, Amphibians and Reptiles of Baja California, Univ. California Press) treated previously recognized subspecies of *C. variegatus* in Baja California as pattern classes; however, that decision seems to have been based at least partly on a philosophical opposition to the recognition of subspecies as well as on qualitative assessments of intergradation and did not address the status of taxa not occurring in Baja California. We have retained the subspecies pending a more explicit and comprehensive study.

*C. v. abbotti* Klauber, 1945—San Diego Banded Gecko

*C. v. bogerti* Klauber, 1945—Tucson Banded Gecko

*C. v. utahensis* Klauber, 1945—Utah Banded Gecko

*C. v. variegatus* (Baird, 1859)—Desert Banded Gecko

***Cophosaurus*** Troschel, 1852 “1850”—GREATER EARLESS LIZARDS

Taxonomy for *Cophosaurus* follows de Queiroz (1989, Ph.D. dissertation, Univ. California, Berkeley).

***C. texanus*** Troschel, 1852 “1850”—Greater Earless Lizard

Blaine (2008, Ph.D. dissertation, Washington Univ.) found that most *C. texanus* sampled within the United States formed three non-overlapping mtDNA haplotype clades, the relationships among which were poorly supported. If the central clade is more closely related to the western clade, then the two primary clades would correspond roughly with the two subspecies of *C. texanus* that occur in the United States. Samples from the vicinity of Eagle Pass, Maverick County, Texas, formed a separate, earlier diverging clade that could represent a separate species or subspecies.

*C. t. scitulus* (Peters, 1951)—Chihuahuan Greater Earless Lizard

*C. t. texanus* Troschel, 1852—Texas Greater Earless Lizard

***Crotaphytus*** Holbrook, 1842—COLLARED LIZARDS

Taxonomy for *Crotaphytus* follows McGuire (1996, Bull. Carnegie Mus. Nat. Hist. 32: 1–143); for precedence of *C. vestigium* over *C. fasciolatus* see McGuire (2000, Bull. Zool. Nomencl. 57: 158–161) and ICZN (2002, Bull. Zool. Nomencl. 59: 228–229). McGuire et al. (2007, Evolution 61: 2879–2897) interpreted incongruencies between their mtDNA phylogeny and currently recognized species boundaries in *Crotaphytus* as evidence for introgression of *C. collaris* haplotypes into both *C. reticulatus* and *C. bicinctores* resulting from past hybridization during glacial maxima.

***C. bicinctores*** Smith and Tanner, 1972—Great Basin Collared Lizard

***C. collaris*** (Say, 1823)—Eastern Collared Lizard

***C. nebrius*** Axtell and Montanucci, 1977—Sonoran Collared Lizard

***C. reticulatus*** Baird, 1859 “1858”—Reticulate Collared Lizard

***C. vestigium*** Smith and Tanner, 1972—Baja California Collared Lizard

***Dipsosaurus*** Hallowell, 1854—DESERT IGUANAS

Taxonomy for *Dipsosaurus* follows de Queiroz (1995, Publ. Espec. Mus. Zool. Univ. Nac. Autón. México 9: 1–48).

***D. dorsalis*** (Baird and Girard, 1852)—Desert Iguana

*D. d. dorsalis* (Baird and Girard, 1852)—Northern Desert Iguana

***Elgaria*** Gray, 1838—Western Alligator Lizards

Taxonomy for *Elgaria* follows Good (1988, Univ. California Pub. Zool. 121: 1–139).

***E. coerulea*** (Wiegmann, 1828)—Northern Alligator Lizard

*E. c. coerulea* (Wiegmann, 1828)—San Francisco Alligator Lizard

*E. c. palmeri* (Stejneger, 1893)—Sierra Alligator Lizard

*E. c. principis* Baird and Girard, 1852—Northwestern Alligator Lizard

*E. c. shastensis* (Fitch, 1934)—Shasta Alligator Lizard

***E. kingii*** Gray, 1838—Madrean Alligator Lizard

*E. k. nobilis* Baird and Girard, 1852—Arizona Alligator Lizard

***E. multica rinata*** (Blainville, 1835)—Southern Alligator Lizard

A molecular phylogeographic study of Feldman and Spicer (2006, Mol. Ecol. 15: 2201–2222) failed to support currently recognized subspecies boundaries within *E. multica rinata* (Fitch, 1938, Am. Midl. Nat. 20: 381–424). Haplotypes from the central

Coast Ranges of California (formerly *E. m. multica rinata*) are more closely related to those from southern (*E. m. webbii*) rather than northern (*E. m. multica rinata*) California, while haplotypes from the Sierra Nevada (formerly *E. m. webbii*) are more closely related to those from northern (*E. m. multica rinata*) rather than southern (*E. m. webbii*) California. In addition, haplotypes representing *E. m. multica rinata* and *E. m. scincicauda* are phylogenetically intermixed, calling their separation into question.

*E. m. multica rinata* (Blainville, 1835)—California Alligator Lizard

*E. m. scincicauda* (Skilton, 1849)—Oregon Alligator Lizard

*E. m. webbii* (Baird, 1859 “1858”)—San Diego Alligator Lizard

*E. panamintina* (Stebbins, 1958)—Panamint Alligator Lizard

The results of Feldman and Spicer (2006, *Mol. Ecol.* 15: 2201–2222) indicate that *E. panamintina* is derived from within *E. multica rinata*.

Eumeces: See *Plestiodon*

***Gambelia*** Baird 1859 “1858”—LEOPARD LIZARDS

Taxonomy for *Gambelia* follows McGuire (1996, *Bull. Carnegie Mus. Nat. Hist.* 32: 1–143) with modifications by Frost and Collins (1988, *Herpetol. Rev.* 19: 73–74; spelling of the specific epithet of *G. sila*).

*G. copeii* (Yarrow, 1882)—Cope’s Leopard Lizard

McGuire et al. (2007 *Evolution* 61: 2879–2897) found the mtDNA of *G. copeii* to be deeply nested within that of *G. wislizenii* and suggested that perhaps the former should not be recognized as a separate species. A study of gene flow (or the absence thereof) between the two forms would clarify the situation.

*G. sila* (Stejneger, 1890)—Blunt-nosed Leopard Lizard

*G. wislizenii* (Baird and Girard, 1852)—Long-nosed Leopard Lizard

***Gerrhonotus*** Wiegmann, 1828—EASTERN ALLIGATOR LIZARDS

Taxonomy for *Gerrhonotus* follows Good (1994, *Herpetol. Monog.* 8: 180–202).

*G. infernalis* Baird, 1859 “1858”—Texas Alligator Lizard

***Heloderma*** Wiegmann, 1829—GILA MONSTERS and BEADED LIZARDS

Taxonomy for *Heloderma* follows Bogert and Martín del Campo (1956, *Bull. Am. Mus. Nat. Hist.* 109: 1–238).

*H. suspectum* Cope, 1869—Gila Monster

Douglas et al. (2010, *Mol. Phylogenet. Evol.* 55: 153–167) stated that they found no mtDNA evidence for the two recognized subspecies of *H. suspectum*; however, their results are difficult to evaluate because little information is provided on the collection localities of the sampled specimens. Further study is needed.

*H. s. cinctum* Bogert and Martín del Campo, 1956—Banded Gila Monster

*H. s. suspectum* Cope, 1869—Reticulate Gila Monster

***Holbrookia*** Girard, 1851—LESSER EARLESS LIZARDS

Taxonomy for *Holbrookia* follows Smith (1946, *Handbook of Lizards*, Cornell Univ. Press) with modifications by Duellman (1955, *Occ. Pap. Mus. Zool. Univ. Michigan* 569: 1–14; synonymy of *H. m. pulchra* with *H. m. thermophila*), Axtell (1956, *Bull.*

Chicago Acad. Sci 10: 163–179; description of *H. maculata perspicua* and treatment of *H. lacerata* as a species), Clarke (1965, Emporia St. Res. Stud. 13: 1–66; removal of *H. texana* to *Cophosaurus*), Lowe (1964, in C. H. Lowe [ed.], The Vertebrates of Arizona, Univ. Arizona Press, Pp. 153–174; recognition of *H. elegans* as a species; for supporting evidence see Adest, 1978, Ph.D. dissertation, Univ. California, Los Angeles, Wilgenbusch and de Queiroz, 2000, Syst. Biol. 49: 592–612, and Axtell, 1998, Interpretive Atlas of Texas Lizards 18: 1–19), and those described in additional notes below.

***H. elegans*** Bocourt, 1874 in Duméril, Mocquard & Bocourt, 1870-1909

—Elegant Earless Lizard

Blaine (2008, Ph.D. dissertation, Washington Univ.) found large levels of mtDNA sequence divergence between samples of this putative species from Arizona and southern Sonora (*H. e. thermophila*) versus those from southern Sinaloa (*H. e. elegans*), though large sampling gaps make it difficult to determine whether these forms represent separate species. His data also support the synonymy of *H. m. pulchra* with *H. e. thermophila*.

*H. e. thermophila* Barbour, 1921—Sonoran Earless Lizard

***H. lacerata*** Cope, 1880—Spot-tailed Earless Lizard

*H. l. lacerata* Cope, 1880—Northern Spot-tailed Earless Lizard

*H. l. subcaudalis* Axtell, 1956—Southern Spot-tailed Earless Lizard

***H. maculata*** Girard, 1851—Common Lesser Earless Lizard

Blaine (2008, Ph.D. dissertation, Washington Univ.) found that *Holbrookia maculata* from the United States formed three non-overlapping mtDNA haplotype clades inhabiting the Great Plains, the northern Chihuahuan Desert, and the southern Colorado Plateau.

Because his results contradict the taxonomy previously adopted in this list, we have applied the oldest available names to the three haplotype clades and treated them as subspecies.

*H. m. campi* Schmidt, 1921—Plateau Earless Lizard

*H. m. flavilenta* Cope, 1883—Chihuahuan Lesser Earless Lizard

*H. m. maculata* Girard, 1851—Great Plains Earless Lizard

*H. m. perspicua* Axtell, 1956—Prairie Earless Lizard

This subspecies was not sampled by Blaine (2008, Ph.D. dissertation, Washington Univ.) and is thus presently retained until future studies can address its status.

*H. m. ruthveni* Smith, 1943—Bleached Earless Lizard

Although mtDNA haplotypes of *H. m. ruthveni* are nested within those of the taxon that is here called *H. m. flavilenta* (Blaine, 2008, Ph.D. dissertation, Washington Univ.), Rosenblum and Harmon (2010, Evolution 65: 946–960) found that earless lizards from the White Sands had diverged both morphologically and genetically from their counterparts on adjacent darker soils and concluded that the populations are well on their way toward completing speciation. On the other hand, data from ecotonal individuals suggest that the populations continue to exchange genes (i.e., that speciation is incomplete), and therefore it seems appropriate to treat the bleached form as a subspecies in the sense of a partially separated lineage.

***H. propinqua*** Baird and Girard 1852—Keeled Earless Lizard

*H. p. propinqua* Baird and Girard 1852—Northern Keeled Earless Lizard

Blaine (2008, Ph.D. dissertation, Washington Univ.) found that mtDNA from *H. p. propinqua* forms two non-overlapping haplotype clades, one from the red sands south of

the Balcones Escarpment and another from the white sands near the southeastern part of the Balcones Escarpment south into the Gulf Coastal Plain.

***Ophisaurus*** Daudin, 1803—GLASS LIZARDS

Taxonomy for *Ophisaurus* follows McConkey (1954, Bull. Florida St. Mus. Biol. Sci. 2: 13–23) with modifications by Palmer (1987, Herpetologica, 43: 415–423; description of *O. mimicus*). Macey et al. (1999, Mol. Phylogenet. Evol. 12: 250–272) presented mtDNA evidence that *Ophisaurus*, if it includes North American, European, African, and Asian species, is not monophyletic. Although they favored placing all species in *Anguis*, this action is both nomenclaturally disruptive and makes *Anguis* redundant with Anguinae; we have therefore adopted their alternative proposal of retaining *Ophisaurus* for the North American and Southeast Asian species.

***O. attenuatus*** Cope, 1880—Slender Glass Lizard

*O. a. attenuatus* Cope, 1880—Western Slender Glass Lizard

*O. a. longicaudus* McConkey, 1952—Eastern Slender Glass Lizard

***O. compressus*** Cope, 1900—Island Glass Lizard

***O. mimicus*** Palmer, 1987—Mimic Glass Lizard

***O. ventralis*** (Linnaeus, 1766)—Eastern Glass Lizard

Neoseps: See *Plestiodon*.

***Petrosaurus*** Boulenger, 1885—BANDED ROCK LIZARDS

Taxonomy for *Petrosaurus* follows Jennings (1990, Cat. Am. Amph. Rept. 494; 1990, Cat. Am. Amph. Rept. 495), with modifications by Grismer (1999, Herpetologica 55: 446–469; treatment of *P. mearnsi* and *P. slevini* as separate species).

***P. mearnsi*** (Stejneger, 1894)—Mearn’s Rock Lizard

*P. m. mearnsi* (Stejneger, 1894)—Mearns’ Rock Lizard

***Phrynosoma*** Wiegmann, 1828—HORNED LIZARDS

Taxonomy for *Phrynosoma* follows Reeve (1952, Univ. Kansas Sci. Bull. 34: 817–960) with modifications by Zamudio et al. (1997, Syst. Biol. 46: 284–305; treatment of *P. hernandesi* as a separate species from *P. douglasii* and implied treatment of *P. d. brevirostre*, *P. d. ornatissum*, and *P. d. ornatum* as synonyms of *P. hernandesi*), Montanucci (2004, Herpetologica 60: 117–139; treatment of *P. blainvillii* as a separate species from *P. coronatum*; see also Leaché et al., 2009, Proc. Natl. Acad. Sci. USA 106: 12418–12423), Mulcahy et al. (2006, Mol. Ecol. 15: 1807–1826; treatment of *P. goodei* as a separate species from *P. platyrhinos*), and those described in additional notes below. Leaché and McGuire (2006, Mol. Phylogenet. Evol. 39: 628–644) named four subclades of *Phrynosoma* based on the results of phylogenetic analyses of mitochondrial and nuclear genes. We have included names of subclades parenthetically, where applicable.

***P. (Anota) blainvillii*** Gray, 1839—Blainville’s Horned Lizard

***P. cornutum*** (Harlan, 1825)—Texas Horned Lizard

***P. (Tapaja) douglasii*** (Bell, 1829)—Pygmy Short-horned Lizard

***P. (Doliosaurus) goodei*** Stejneger, 1893—Goode’s Horned Lizard

***P. (Tapaja) hernandesi*** Girard, 1858—Greater Short-horned Lizard

*P. (T.) h. hernandesi* Girard, 1858—Hernandez’s Short-horned Lizard

Zamudio et al. (1997, Syst. Biol. 46: 284–305) did not explicitly propose to eliminate the previously recognized subspecies taxa within *P. hernandesi*, though they presented

mtDNA evidence that the subspecies *brevirostre*, *hernandesi*, and *ornatissimum*, as previously circumscribed, are artificial assemblages of populations. They also did not sample the Mexican taxon formerly known as *P. d. brachycercum*, which they noted shares morphological characters with *P. hernandesi*. The possibilities remain that *brachycercum* constitutes 1) a lineage that is related to but fully separated from *P. hernandesi*, 2) a partially separated lineage within *P. hernandesi*, or 3) an unseparated (artificial) part of the *hernandesi* lineage. Until the status of this taxon is addressed explicitly, we have treated it as a valid subspecies taxon and therefore have treated the remaining populations of *P. hernandesi*, including all those occurring in the United States, as the subspecies *P. h. hernandesi*.

***P. (Anota) mcallii*** (Hallowell, 1852)—Flat-tailed Horned Lizard

***P. (Doliosaurus) modestum*** Girard, 1852—Round-tailed Horned Lizard

***P. (Doliosaurus) platyrhinos*** Girard, 1852—Desert Horned Lizard

According to Pianka (1991, Cat. Am. Amph. Rept. 517), the putative diagnostic characters for the subspecies of *Phrynosoma platyrhinos* are not reliable, which calls the taxa themselves into question. Phylogenetic analysis of mtDNA sequences by Mulcahy et al. (2006, Mol. Ecol. 15: 1807–1826) raised the possibility of an additional species or subspecies from the Yuma Proving Ground.

*P. (D.) p. calidiarum* (Cope, 1896)—Southern Desert Horned Lizard

*P. (D.) p. platyrhinos* Girard, 1852—Northern Desert Horned Lizard

***P. (Anota) solare*** Gray, 1845—Regal Horned Lizard

### ***Phyllodactylus*** Gray, 1828—LEAF-TOED GECKOS

Taxonomy for *Phyllodactylus* follows Dixon (1969, Cat. Am. Amph. Rept. 79; 1973, Cat. Am. Amph. Rept. 141) with modifications by Murphy (1983, Occ. Pap. California Acad. Sci. 137: 1–48; treatment of *P. nocticolus* as a species separate from *P. xanti*; see also Blair et al., 2009, Zootaxa 2027: 28–42).

***P. nocticolus*** Dixon, 1964—Peninsula Leaf-toed Gecko

### ***Plestiodon*** Duméril and Bibron, 1839—TOOTHY SKINKS

Taxonomy for *Plestiodon* (often as *Eumeces*) follows Taylor (1935, Univ. Kansas Sci. Bull. 23: 1–643) with modifications by Rodgers (1944, Copeia 1944: 101–104; description of *P. gilberti placerensis*), Smith (1946, Univ. Kansas Pub. Mus. Nat. Hist. 1: 85–89; resurrection of *P. anthracinus pluvialis*), Rodgers and Fitch (1947, Univ. California Pub. Zool. 48: 169–220; description of *P. gilberti cancellosus* and treatment of *P. skiltonianus brevipes* as a synonym of *P. gilberti gilberti*), Smith and Slater (1949, Trans. Kansas Acad. Sci. 52: 438–448; description of *P. septentrionalis pallidus*), McConkey (1957, Bull. Florida St. Mus. (Biol. Sci.) 2: 13–23; description of *P. egregius similis*), Lowe and Shannon (1954, Herpetologica 10: 185–187; description of *P. gilberti arizonensis*), Lowe (1955b, Herpetologica 11: 233–235; treatment of *P. gaigeae* as a subspecies of *P. multivirgatus*), Mecham (1957, Copeia 1957: 111–123; treatment of *P. taylora* as a synonym of *P. m. gaigeae*), Tanner (1958, Great Basin Nat. 17: 59–94; descriptions of *P. skiltonianus utahensis* and *P. s. interparietalis*), Axtell (1961, Texas J. Sci. 13: 345–351; see also Axtell and Smith, 2004, Southwest. Nat. 49: 100; priority of *P. multivirgatus epipleurotus* over *P. m. gaigeae*), Mount (1965, The Reptiles and Amphibians of Alabama, Auburn Univ. Agric. Exper. Station; descriptions of *P. egregius lividus* and *P. e. insularis*), Lieb (1985, Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. 357: 1–19; treatment of *P. brevilineatus* and *P. tetragrammus* as subspecies of a single species), Tanner (1987, Great Basin Nat. 47: 383–421; treatment of *P. callicephalus* as a

separate species from *P. tetragrammus*), Brandley et al. 2005 (Syst. Biol. 54: 373–390; restriction of *Eumeces* and resurrection of *Plestiodon* for a clade containing all of the North American species and inclusion of the taxon formerly known as *Neoseps reynoldsi*), and those described in additional notes below. With the restriction of *Eumeces* to the former *E. schneideri* group (Brandley et al., op. cit.), the standard English name Great Skinks is appropriate for the members of that clade.

***P. anthracinus*** (Baird, 1850)—Coal Skink

*P. a. anthracinus* Baird, 1850—Northern Coal Skink

*P. a. pluvialis* (Cope, 1880)—Southern Coal Skink

***P. callicephalus*** (Bocourt, 1879 in Duméril, Mocquard & Bocourt, 1870–1909)—Mountain Skink

***P. egregius*** Baird, 1859 “1858”—Mole Skink

Branch et al. (2003, Conserv. Gen. 4: 199–212) found that the mainland subspecies *P. e. lividus*, *P. e. onocrepis*, and *P. e. similis* exhibit phylogenetic intermixing of mtDNA haplotypes, suggesting that continued recognition of these taxa may not be warranted.

*P. e. egregius* Baird, 1859—Florida Keys Mole Skink

*P. e. insularis* (Mount, 1965)—Cedar Key Mole Skink

*P. e. lividus* (Mount, 1965)—Blue-tailed Mole Skink

*P. e. onocrepis* Cope, 1871—Peninsula Mole Skink

*P. e. similis* (McConkey, 1957)—Northern Mole Skink

***P. fasciatus*** (Linnaeus, 1758)—Common Five-lined Skink

Howes et al. (2006, Mol. Phylogenet. Evol. 40: 183–194) and Richmond (2006, Evol.

Dev. 8: 477–490) presented mitochondrial and nuclear DNA evidence of substantial phylogeographic structure within *P. fasciatus*. Although neither set of authors drew any taxonomic conclusions from their results, those results suggest the possibility of one or more cryptic species; in particular, samples from the eastern Carolinas are highly divergent in both mtDNA and microsatellites from nearby populations.

***P. gilberti*** (Van Denburgh, 1896)—Gilbert’s Skink

Richmond and Reeder (2002, Evolution 56: 1498–1513) presented mitochondrial DNA evidence that populations previously referred to *Plestiodon gilberti* represent three lineages that separately evolved large body size and the loss of stripes in late ontogenetic stages. Although they considered those three lineages to merit species recognition, they did not propose specific taxonomic changes, and subsequently Richmond and Jockusch (2007, Proc. Roy. Soc. Lond. B 274: 1701–1708) and Richmond et al. (2011, Am. Nat. 178: 320–332) have treated them as a single species based on extensive introgressive hybridization between two of the forms and the lack of prezygotic isolation between members of all pairs of them. The results of Richmond and Reeder (op. cit.) contradict the recognition of *P. g. arizonensis*, which is not differentiated from *P. g. rubricaudatus* and therefore has been eliminated from this list, and indicate the existence of an unnamed and at least partially separate lineage within *P. g. rubricaudatus* (their Inyo clade).

*P. g. cancellosus* (Rodgers and Fitch, 1947)—Variegated Skink

*P. g. gilberti* (Van Denburgh, 1896)—Greater Brown Skink

*P. g. placerensis* (Rodgers, 1944)—Northern Brown Skink

*P. g. rubricaudatus* (Taylor, 1935)—Western Red-tailed Skink

***P. inexpectatus*** (Taylor, 1932)—Southeastern Five-lined Skink

***P. laticeps*** (Schneider, 1801)—Broad-headed Skink

Richmond (2006, Evol. Dev. 8: 477–490) found a substantial division between mtDNA haplotypes of eastern and western *P. laticeps* but did not draw any taxonomic conclusion from it.

***P. multivirgatus*** Hallowell, 1857—Many-lined Skink

*P. m. epipleurotus* (Cope, 1880)—Variable Skink  
Hammerson (1999, Amphibians and Reptiles in Colorado, Univ. Press of Colorado) argued, based on diagnosability and the apparent absence of intergrades, that *Plestiodon multivirgatus epipleurotus* (under the name *P. gaigeae*) is a different species than *P. m. multivirgatus*. We have refrained from adopting this proposal pending an explicit analysis.

*P. m. multivirgatus* Hallowell, 1857—Northern Many-lined Skink

***P. obsoletus*** Baird and Girard, 1852—Great Plains Skink***P. reynoldsi*** (Stejneger, 1910)—Florida Sand Skink

Branch et al. (2003, Conserv. Gen. 4: 199–212) found strong phylogeographic structuring in *P. reynoldsi*, with separate mtDNA clades occupying the Mt. Dora Ridge and the northern, central, and southern portions of the Lake Wales Ridge, but they did not propose to recognize those units taxonomically.

***P. septentrionalis*** Baird, 1859 “1858”—Prairie Skink

*Plestiodon septentrionalis septentrionalis* and *P. s. obtusirostris* have sometimes been recognized as species based on allopatry and morphological diagnosability (e.g., Collins, 1991, Herpetol. Rev. 22: 42–43; 1993, Univ. Kansas Mus. Nat. Hist. Public Edu. Ser. No. 13). Fuerst and Austin (2004, J. Herpetol. 38: 257–268) presented mtDNA evidence of 6–7% sequence divergence between *P. s. septentrionalis* and *P. s. obtusirostris*; however, their geographic sampling was inadequate to address genetic continuity versus discontinuity between these taxa. In addition, the name *P. s. pallidus*, absent from the literature of the last 40 years, apparently has never been explicitly treated as a synonym of either *P. s. septentrionalis* or *P. s. obtusirostris*. We have retained the older arrangement of a single species with three subspecies until a rearrangement is proposed based on a study of all three taxa and thorough geographic sampling.

*P. s. obtusirostris* (Bocourt, 1879)—Southern Prairie Skink

*P. s. pallidus* (Smith and Slater, 1949)—Pallid Skink

*P. s. septentrionalis* Baird, 1859—Northern Prairie Skink

***P. skiltonianus*** Baird and Girard, 1852—Western Skink

Richmond and Reeder (2002, Evolution 56: 1498–1513) presented mitochondrial DNA evidence that *P. s. skiltonianus* is paraphyletic with respect to both *P. s. interparietalis* and *P. s. utahensis* as well as to the species *P. lagunensis* (Baja California) and to two of the three lineages of *P. gilberti*.

*P. s. interparietalis* (Tanner, 1958 “1957”)—Coronado Skink

*P. s. skiltonianus* Baird and Girard, 1852—Skilton’s Skink

*P. s. utahensis* (Tanner, 1958 “1957”)—Great Basin Skink

***P. tetragrammus*** Baird, 1859 “1858”—Four-lined Skink

Lieb (1985, Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. 357: 1–19) treated *Plestiodon callicephalus* as a subspecies of *P. tetragrammus* (see note on *P. callicephalus*).

*P. t. brevilineatus* (Cope, 1880)—Short-lined Skink

*P. t. tetragrammus* Baird, 1859—Long-lined Skink

***Rhineura*** Cope, 1861—WIDE-SNOURED WORMLIZARDS

Taxonomy for *Rhineura* follows Gans (1967, Cat. Am. Amph. Rept. 42; 1967, Cat. Am. Amph. Rept. 43).

***R. floridana*** (Baird, 1859 “1858”)—Florida Wormlizard

Mulvaney et al. (2005, J. Herpetol. 39: 118–124) found mtDNA evidence of substantial divergence between northern and southern populations of *Rhineura floridana* and



indicated that these groups of populations may be candidates for recognition as separate species.

***Sauromalus* Duméril, 1856—CHUCKWALLAS**

Taxonomy for *Sauromalus* follows Hollingsworth (1998, *Herpetol. Monog.* 12: 38–191) and the ICZN (2004, *Bull. Zool. Nomencl.* 61: 74–75; precedence of the name *S. ater* over *S. obesus*).

***S. ater* Duméril, 1856—Common Chuckwalla**

Although all mainland populations of *Sauromalus* are currently considered to constitute a single species, intergradation or the lack thereof between groups based on mtDNA haplotype clades (Petren and Case, 2002, in T. J. Case, M. L. Cody, and E. Ezcurra [eds.], *A New Island Biogeography of the Sea of Cortés*, Oxford Univ. Press, Pp. 574–579) deserves further study.

***Sceloporus* Wiegmann, 1828—SPINY LIZARDS**

Taxonomy for *Sceloporus* follows Schmidt (1953, *A Check List of North American Amphibians and Reptiles*, Univ. Chicago Press, Chicago) with modifications by Bell (1954, *Herpetologica* 10: 31–36; resurrection of *S. occidentalis bocourtii* and *S. o. longipes*), Shannon and Urbano (1954, *Herpetologica* 10: 189–191; description of *S. clarki vallaris*), Phelan and Brattstrom (1955, *Herpetologica* 11: 1–14; description of *S. magister uniformis*, *S. m. bimaculosus*, and *S. m. transversus*), Tanner (1955, *Great Basin Nat.* 15: 32–34; description of *S. magister cephaloflavus*), Lowe and Norris (1956, *Herpetologica* 12: 125–127; description of *S. undulatus cowlesi*), Maslin (1956, *Herpetologica* 12: 291–294; description of *S. undulatus erythrocheilus*), Smith and Chrapliwy (1958, *Herpetologica* 13: 267–271; description of subspecies of *S. poinsettii*), Cole (1963, *Copeia* 1963: 413–425; treatment of *S. virgatus* as a species separate from *S. undulatus*), Degenhardt and Jones (1972, *Herpetologica* 28: 212–217; description of *S. graciosus arenicolous*), Olson (1973, *Herpetologica* 29: 116–127; description of *S. merriami longipunctatus*), Sites and Dixon (1981, *J. Herpetol.* 15: 59–69; treatment of *disparilis* as a synonym of *microlepidotus*), Collins (1991, *Herpetol. Rev.* 22: 42–43; treatment of *S. arenicolus* as a species separate from *S. graciosus*), Smith et al. (1992, *Bull. Maryland Herpetol. Soc.* 28: 123–149; description of *S. undulatus tedbrowni* and correction of the spelling of the name *S. arenicolus*), Smith et al. (1996, *Bull. Maryland Herpetol. Soc.* 32: 70–74; treatment of *S. slevini* as a species separate from *S. scalaris*), Wiens et al. (1999, *Evolution* 53: 1884–1897; restriction of the name *S. jarrovii* to one of five inferred species formerly referred to by that name), Leaché and Reeder (2002, *Syst. Biol.* 51: 44–68; treatment of *S. consobrinus*, *S. cowelsi*, and *S. tristichus* as separate species from *S. undulatus*), Schulte et al. (2006, *Mol. Phylogenet. Evol.* 39: 873–880; treatment of *S. bimaculosus* and *S. uniformis* as species separate from *S. magister*; see Leaché and Mulcahy, 2007, *Mol. Ecol.* 16: 5216–5233 for clarification of the distributional limits of those species), and those described in additional notes below.

***S. arenicolus* Degenhardt and Jones, 1972—Dunes Sagebrush Lizard**  
Chan et al. (2009, *Conserv. Genet.* 10: 131–142) found mitochondrial DNA and microsatellite evidence of differentiation of *S. arenicolus* populations into three genetic clusters that appear to be recently separated and still experiencing gene flow.

***S. bimaculosus* Phelan and Brattstrom, 1955—Twin-spotted Spiny Lizard**

***S. clarkii* Baird and Girard, 1852—Clark’s Spiny Lizard**

*S. c. clarkii* Baird and Girard, 1852—Sonoran Spiny Lizard

*S. c. vallis* Shannon and Urbano, 1954—Plateau Spiny Lizard

***S. consobrinus*** Baird and Girard, 1853—Prairie Lizard

Leaché and Reeder (2002, Syst. Biol. 51: 44–68) noted that the name *S. thayerii* Baird and Girard 1852 (type locality: Indianola, Calhoun Co., TX) may turn out to be the correct name of this species and that populations east of the Mississippi River along the Gulf Coast may represent a separate species.

***S. cowlesi*** Lowe and Norris, 1956—Southwestern Fence Lizard

Leaché and Reeder (2002, Syst. Biol. 51: 44–68) applied the name *S. cowlesi* to the populations from roughly the region of the Chihuahuan Desert. Although the name *S. cowlesi* was originally applied to light colored lizards from the White Sands of New Mexico, Leaché and Reeder (op. cit.) presented evidence that mtDNA haplotypes from White Sands lizards are deeply nested within a clade of haplotypes from geographically proximate darker lizards, and Rosenblum (2006, Am. Nat. 167: 1–15) found both phylogenetic mixing of haplotypes between light and dark forms and evidence of gene flow between them. Rosenblum and Harmon (2010, Evolution 65: 946–960) found that fence lizards from the White Sands exhibited discordant patterns of morphological and genetic differentiation from their counterparts on adjacent darker soils and concluded that the populations have made incomplete progress toward speciation. Leaché and Cole (2007, Mol. Ecol. 16: 1035–1054) presented evidence for hybridization between *S. cowlesi* and *S. tristichus*.

***S. cyanogenys*** Cope, 1885—Blue Spiny Lizard

Olson (1987, Bull. Maryland Herpetol. Soc. 23: 158–167) treated *Sceloporus cyanogenys* as a subspecies of *S. serrifer* based on apparent integrades between the former species and *S. serrifer pliopus*. Martínez-Méndez and Méndez de la Cruz (2007, Zootaxa 1609: 53–68) inferred *S. serrifer pliopus* and *S. cyanogenys* to form a mtDNA clade; however, that clade was relatively distantly related to *S. serrifer serrifer* and *S. serrifer prezygus* haplotypes (see also Wiens et al., 2010, Mol. Phylogenet. Evol. 54: 150–161). Therefore, they synonymized the name *S. s. pliopus* with *S. cyanogenys*, retaining *S. serrifer* for a species that occurs south and east of the Isthmus of Tehuantepec.

***S. graciosus*** Baird and Girard, 1852—Common Sagebrush Lizard

*S. g. gracilis* Baird and Girard, 1852—Western Sagebrush Lizard

*S. g. graciosus* Baird and Girard, 1852—Northern Sagebrush Lizard

*S. g. vandenburgianus* Cope, 1896—Southern Sagebrush Lizard

Censky (1986, Cat. Am. Amph. Rept. 386) treated *Sceloporus graciosus vandenburgianus* as a subspecies of *S. graciosus*, but Collins (1991, Herpetol. Rev. 22: 42–43) proposed recognizing this taxon as a species, *S. vandenburgianus*. Wiens and Reeder (1997, Herpetol. Monog. 11: 1–101) followed Collins's proposal but noted the morphological similarity and geographic proximity of this taxon to populations of *S. graciosus gracilis*. We have retained the traditional taxonomy pending a detailed phylogeographic study.

***S. grammicus*** Wiegmann, 1828—Graphic Spiny Lizard

Lizards currently referred to *Sceloporus grammicus* form a complex series of chromosome races that likely represent multiple species (Sites, 1983, Evolution 37: 38–53; Arévalo et al., 1991, Herpetol. Monog. 5: 79–115). A detailed phylogeographic study of this species complex is sorely needed.

*S. g. microlepidotus* Wiegmann, 1828—Mesquite Lizard

***S. jarrovii*** Cope, in Yarrow, 1875—Yarrow's Spiny Lizard

***S. magister*** Hallowell, 1854—Desert Spiny Lizard

Leaché and Mulcahy (2007, Mol. Ecol. 16: 5216–5233) found evidence of asymmetrical

gene flow between *S. magister* and both *S. bimaculosus* and *S. uniformis*, with *S. magister* acting as a genetic “sink”. Because these lineages show evidence of both separation (with divergence) and ongoing asymmetrical gene flow, they can be considered partially separated species. Leaché and Mulcahy (op. cit.) also identified a fourth potentially separate lineage in northeastern Baja California (currently unnamed). Schulte et al. (2006, Mol. Phylogenet. Evol. 39: 873–880) recognized the subspecies *S. m. magister* and *S. m. cephaloflavus* because their single sample from the Colorado Plateau (assumed to represent the subspecies *S. m. cephaloflavus*) was inferred to be the sister group of the samples representing *S. m. magister*. Leaché and Mulcahy (op. cit.), however, found that specimens from closer to the type locality of *S. m. cephaloflavus* were part of *S. uniformis* rather than *S. magister*; consequently, we have not recognized subspecies within *S. magister*.

***S. merriami*** Stejneger, 1904—Canyon Lizard

*S. m. annulatus* Smith, 1937—Big Bend Canyon Lizard

*S. m. longipunctatus* Olson, 1973—Presidio Canyon Lizard

*S. m. merriami* Stejneger, 1904—Merriam’s Canyon Lizard

***S. occidentalis*** Baird and Girard, 1852—Western Fence Lizard

Leaché et al. (2010, Biol. Jo. Linn. Soc. 100: 630–641) presented mtDNA evidence that the previously recognized subspecies *S. o. taylori* is polyphyletic and represents convergent phenotypic evolution among high elevation populations of *S. o. biseriatus*.

*S. o. becki* Van Denburgh, 1905—Island Fence Lizard

Wiens and Reeder (1997, Herpetol. Monog. 11: 1–101) suggested that *Sceloporus occidentalis becki* should probably be recognized as a species on the basis of diagnosability and allopatry relative to other *S. occidentalis*.

*S. o. biseriatus* Hallowell, 1854—San Joaquin Fence Lizard

*S. o. bocourtii* Boulenger, 1885—Coast Range Fence Lizard

*S. o. longipes* Baird, 1859 “1858”—Great Basin Fence Lizard

*S. o. occidentalis* Baird and Girard, 1852—Northwestern Fence Lizard

***S. olivaceus*** Smith, 1934—Texas Spiny Lizard

***S. orcutti*** Stejneger, 1893—Granite Spiny Lizard

***S. poinsettii*** Baird and Girard, 1852—Crevice Spiny Lizard

Webb (2006, Bull. Md. Herpetol. Soc. 42: 65–114) recognized five subspecies of *S. poinsettii*, two of which occur in the United States. Given the large area inhabited by lizards not assigned to any of the five subspecies, geographic variation in this taxon deserves further study.

*S. p. axtelli* Webb, 2006—Texas Crevice Spiny Lizard

*S. p. poinsettii* Baird and Girard, 1852—New Mexico Crevice Spiny Lizard

***S. slevini*** Smith, 1937—Slevin’s Bunchgrass Lizard

*S. tristichus* Cope in Yarrow 1875—Plateau Fence Lizard

Leaché and Cole (2007, Mol. Ecol. 16: 1035–1054) presented evidence for hybridization between *S. tristichus* and *S. cowlesi*.

***S. undulatus*** (Bosc and Daudin in Sonnini and Latreille, 1801)—Eastern Fence Lizard

***S. uniformis*** Phelan and Brattstrom, 1955—Yellow-backed Spiny Lizard

***S. variabilis*** Wiegmann, 1834—Rose-bellied Lizard

*S. v. marmoratus* Hallowell, 1852—Texas Rose-bellied Lizard

Based on patterns of electrophoretically detectable genetic variation, Mendoza-Quijano

et al. (1998, Copeia 1998: 354–366) treated *Sceloporus marmoratus* as a species separate from *S. variabilis*; however, their sample of *S. v. marmoratus* was from a single locality separated by more than 500 km from the closest sample of *S. v. variabilis*. More extensive sampling of these taxa from intermediate localities is needed to determine if they constitute separate lineages.

***S. virgatus* Smith, 1938—Striped Plateau Lizard**

Tenessen and Zamudio (2008, Copeia 2008: 558–564) presented evidence of high genetic divergence and, for the most part, reciprocal monophyly in mtDNA haplotypes, among populations of *S. virgatus* from the Chiricahua, Animas, Peloncillo, and San Luis mountain ranges, suggesting isolation of those populations for hundreds of thousands to millions of years and the possibility of intrinsic reproductive barriers.

***S. woodi* Stejneger, 1918—Florida Scrub Lizard**

Branch et al. (2003, Conserv. Gen. 4: 199–212) found strong phylogeographic structuring in *S. woodi*, with mtDNA of lizards from populations occupying different major scrub archipelagos differing by 2.0–8.0% and likely qualifying as evolutionarily significant units.

***Scincella* Mittleman, 1950—GROUND SKINKS**

Taxonomy for *Scincella* follows Greer (1974, Austral. J. Zool. Suppl. Ser. 31: 1–67).

***S. lateralis* (Say in James, 1823)—Little Brown Skink**

Jackson and Austin (2009, Evolution 64: 409–428) presented evidence of significant genetic structure among populations of *S. lateralis* as well as of gene flow between both haplotype clades and population clusters inferred from microsatellite data.

***Sphaerodactylus* Wagler, 1830—DWARF GECKOS**

Taxonomy for *Sphaerodactylus* follows Kluge (1995, Am. Mus. Novit. 3139: 1–23) and Schwartz and Henderson (1988, Contrib. Biol. Geol. Milwaukee Pub. Mus. 74: 1–264).

***S. notatus* Baird, 1859 “1858”—Reef Gecko**

*S. n. notatus* Baird, 1859 “1858”—Florida Reef Gecko

***Uma* Baird, 1859 “1858”—FRINGE-TOED LIZARDS**

Taxonomy for *Uma* follows Pough (1973, Cat. Am. Amph. Rept. 126; 1974, Cat. Am. Amph. Rept. 155; 1977, Cat. Am. Amph. Rept. 197; see also de Queiroz, 1989, Ph.D. dissertation, Univ. California, Berkeley), with modifications by Trépanier and Murphy (2001, Mol. Phylogenet. Evol. 18: 327–334; treatment of *U. rufopunctata* as a species separate from *U. notata*), and those described in additional notes below.

***U. inornata* Cope, 1895—Coachella Fringe-toed Lizard**

Hedtke et al. (2007, Herpetologica 63: 411–420) found low levels of differentiation among populations of *U. inornata*.

***U. notata* Baird, 1859 “1858”—Colorado Desert Fringe-toed Lizard**

***U. rufopunctata* Cope, 1895—Yuman Desert Fringe-toed Lizard**

Populations formerly assigned to *U. rufopunctata* from the Mohawk Dunes, Yuma Co., AZ appear to represent a currently undescribed cryptic species (Trépanier and Murphy, 2001, Mol. Phylogenet. Evol. 18: 327–334).

***U. scoparia* Cope, 1894—Mohave Fringe-toed Lizard**

Murphy et al. (2006, Jo. Arid Environ. 67: 226–247) found that mtDNA haplotypes of *U. scoparia* formed northern and southern clades, with both northern and southern haplotypes present at one locality.

***Urosaurus*** Hallowell, 1854—TREE and BRUSH LIZARDS

Taxonomy for *Urosaurus* follows (Mittleman, 1942, Bull. Mus. Comp. Zool. 91: 103–181) with modifications by Smith and Taylor (1950, Bull. U. S. Natl. Mus. 199: 1–253; treatment of *U. graciosus* as a separate species from *U. ornatus*; see also Lowe, 1955, Herpetologica 11: 96–101), Murray (1953, Herpetologica 9: 110–112; treatment of the name *U. ornatus chiricahuae* as a synonym of *U. o. linearis*), Langebartel and Smith (1954, Herpetologica 10: 125–136; treatment of the name *U. o. linearis* as a synonym of *U. o. schottii*), Lowe (1955, Herpetologica 11: 96–101; description of *U. graciosus shannoni*), Aguirre et al. (1999, Herpetologica 55: 369–381, treatment of the name *U. microscutatus* as a synonym of *U. nigricaudus*), and those described in additional notes below.

***U. graciosus*** Hallowell, 1854—Long-tailed Brush Lizard

Vitt and Dickson (1988, Cat. Am. Amph. Rept. 448) called into question the diagnostic characters used to separate these taxa, implying that there is little evidence for the existence of partially separated lineages.

*U. g. graciosus* Hallowell, 1854—Western Long-tailed Brush Lizard

*U. g. shannoni* Lowe, 1955—Arizona Long-tailed Brush Lizard

***U. nigricaudus*** (Cope, 1864)—Baja California Brush Lizard

Lindell et al. (2008, Biol. Jo. Linn. Soc. 94: 89–104) found several deep phylogeographic divergences in the mtDNA of *U. nigricaudus* that are congruent with Miocene and Pliocene temporary vicariance events. Those divergences, however, were not reflected in previously collected allozyme data (Aguirre et al. 1999, Herpetologica 55: 369–381), which Lindell et al. interpreted as evidence of ongoing gene flow and the absence of speciation. Feldman et al. (2011, Mol. Phylogenet. Evol. 61: 714–725) questioned the conspecificity of *U. nigricaudus* and *U. microscutatus*; however, they did not present any evidence supporting the alternative hypothesis. Moreover, the closer relationship of southern *U. microscutatus* with *U. nigricaudus* than with northern *U. microscutatus* calls into question the previous circumscriptions of those taxa, if not their status as separate species. For justification of the standard English name Baja California (rather than Black-tailed) Brush Lizard see the note on this species in de Queiroz et al. (2003, Herpetol. Rev. 34: 198–201; 2008, in Crother [Ed.], Herp. Circ. 37: 24–45).

***U. ornatus*** (Baird and Girard, 1852)—Ornate Tree Lizard

Haenel (2007, Mol. Ecol. 16: 4321–4334) found substantial phylogeographic structure in the mtDNA of *U. ornatus*, some of which is roughly consistent with previously recognized subspecies (e.g., *U. o. wrighti* from the Colorado Plateau), though other aspects are not (e.g., deep splits within *U. o. schottii*, including some inferred clades for which there are available names). The phylogeography of *U. ornatus* deserves further study, particularly with regard to taxonomic implications.

*U. o. levis* (Stejneger, 1890)—Smooth Tree Lizard

*U. o. ornatus* (Baird and Girard, 1852)—Texas Tree Lizard

*U. o. schmidti* (Mittleman, 1940)—Big Bend Tree Lizard

*U. o. schottii* (Baird, 1859 “1858”)—Schott’s Tree Lizard

*U. o. symmetricus* (Baird, 1859 “1858”)—Colorado River Tree Lizard

*U. o. wrighti* (Schmidt, 1921)—Northern Tree Lizard

***Uta*** Baird and Girard, 1852—SIDE-BLOTCHED LIZARDS

Taxonomy for *Uta* follows Pack and Tanner (1970, Great Basin Nat. 30: 71–90), McKinney (1971, Copeia 1971: 596–613), and Ballinger and Tinkle (1972, Misc. Pub. Mus. Zool. Univ. Michigan 145: 1–83), with modifications described in the note below.

***U. stansburiana*** Baird and Girard in Stansbury 1852—Common Side-blotched Lizard

Upton and Murphy (1997, Mol. Phylogenet. Evol. 8: 104–113) presented mtDNA evidence for a distant relationship between *Uta* specimens from Durango versus those from Baja California and surrounding islands (as well as one locality in western Sonora), and they considered the Durango population to constitute a different species, to which they applied the name *U. stejnegeri*. Corl et al. (2009, Evolution, 64: 79–96) presented a phylogenetic tree based on mtDNA that is roughly congruent with previously recognized subspecies within the United States and corroborates the relatively distant relationship of *U. s. stejnegeri* to specimens from Baja California. Although these two studies are complementary in terms of geographic sampling, significant sampling gaps remain (central and eastern Nevada, northern Baja California, and the southeastern part of the distribution). We have therefore refrained from recognizing *U. stejnegeri* as a species pending a more comprehensive phylogeographic study.

*U. s. elegans* Yarrow, 1882—Western Side-blotched Lizard

*U. s. nevadensis* Ruthven, 1913—Nevada Side-blotched Lizard

*U. s. stansburiana* Baird and Girard, 1852—Northern Side-blotched Lizard

*U. s. stejnegeri* Schmidt, 1921—Eastern Side-blotched Lizard

*U. s. uniformis* Pack and Tanner, 1970—Plateau Side-blotched Lizard

***Xantusia*** Baird, 1859 “1858”—NIGHT LIZARDS

Taxonomy for *Xantusia* follows Savage (1963, Contrib. Sci. Los Angeles Co. Mus. 71: 1–38) with modifications by Bezy (1967, Copeia 1967: 653–661; treatment of *X. arizonae* as a subspecies of *X. vigilis* [but see below]; 1967, J. Arizona Acad. Sci. 4: 163–167; description of *X. vigilis sierrae*; 1972, Contrib. Sci. Los Angeles Co. Mus. 227: 1–29; inclusion of *Klauberina riversiana* in *Xantusia*), Grismer and Galvan (1983, Trans. San Diego Soc. Nat. Hist. 21: 155–165; description of *X. henshawi gracilis*), Papenfuss et al. (2001, Sci. Pap. Nat. Hist. Mus. Univ. Kansas 23: 1–9; description of *X. bezyi* and treatment of *X. arizonae* as a separate species from *X. vigilis*; see also Sinclair et al., 2004, Am. Nat. 164: 396–414 and Leavitt et al., 2007, Mol. Ecol. 16: 4455–4481), Lovich (2001, Herpetologica 57: 470–487; treatment of *X. gracilis* as a separate species from *X. henshawi*), Sinclair et al. (2004, Am. Nat. 164: 396–414; treatment of *X. sierrae* and *X. wigginsi* as separate species from *X. vigilis* and treatment of the name *X. v. utahensis* as a synonym of *X. vigilis*; see also Leavitt et al., 2007, Mol. Ecol. 16: 4455–4481), and those described in additional notes below.

***X. arizonae*** Klauber, 1931—Arizona Night Lizard

***X. bezyi*** Papenfuss, Macey, and Schulte, 2001—Bezy’s Night Lizard

***X. gracilis*** Grismer and Galvan, 1986—Sandstone Night Lizard

***X. henshawi*** Stejneger, 1893—Granite Night Lizard

Lovich (2001, Herpetologica 57: 470–487) presented mtDNA evidence that the populations of *Xantusia henshawi* represent at least three separately evolving lineages, though he did not propose recognizing them as species.

***X. riversiana*** Cope, 1883—Island Night Lizard

*X. r. reticulata* Smith, 1946—San Clemente Night Lizard

*X. r. riversiana* Cope, 1883—San Nicolas Night Lizard

***X. sierrae*** Bezy, 1967—Sierra Night Lizard

Sinclair et al. (2004, *Am. Nat.* 164: 396–414) considered the treatment of *Xantusia sierrae* as a separate species from *X. vigilis* as tentative, because of nesting of mtDNA haplotypes of the former within those of the latter (see also Leavitt et al., 2007, *Mol. Ecol.* 16: 4455–4481).

***X. vigilis*** Baird, 1859 “1858”—Desert Night Lizard

***X. wigginsi*** Savage, 1952—Wiggins’ Night Lizard

Leavitt et al. (2007, *Mol. Ecol.* 16: 4455–4481) documented overlap of the *X. wigginsi* and *X. vigilis* haplotype clades in San Diego County, where it remains to be determined if the two forms are exchanging genes. Those authors also identified two haplotype clades (designated by them as the San Jacinto and Yucca Valley clades) that may represent separate species.

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*Squamata — Snakes*


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***Agkistrodon* Palisot de Beauvois, 1799—AMERICAN MOCCASINS**

***A. contortrix* (Linnaeus, 1766)—Copperhead**

Mitochondrial data suggest that this species may consist of up to three independently evolving lineages not concordant with traditionally recognized subspecies (Guiher and Burbrink 2008, *Mol. Phylogen. Evol.* 48: 112-125).

*A. c. contortrix* (Linnaeus, 1766)—Southern Copperhead

*A. c. laticinctus* Gloyd and Conant, 1934—Broad-banded Copperhead

*A. c. mokasen* Palisot de Beauvois, 1799—Northern Copperhead

*A. c. phaeogaster* Gloyd, 1969—Osage Copperhead

*A. c. pictigaster* Gloyd and Conant, 1943—Trans-Pecos Copperhead

***A. piscivorus* (Lacépède, 1789)—Cottonmouth**

Mitochondrial data suggest that this species may consist of two independently evolving lineages not concordant with traditionally recognized subspecies (Guiher and Burbrink, 2008, *Mol. Phylogen. Evol.* 48: 112-125.)

*A. p. conanti* Gloyd, 1969—Florida Cottonmouth

*A. p. leucostoma* (Troost, 1836)—Western Cottonmouth

*A. p. piscivorus* (Lacépède, 1789)—Eastern Cottonmouth

***Arizona* Kennicott, in Baird, 1859—GLOSSY SNAKES**

Collins (1991, *Herpetol. Rev.* 22: 42–43) elevated *A. e. occidentalis* to specific status to include all populations in the Sonoran and Mohave Desert regions, the first use of this binomial. Liner (1994, *SSAR Herpetol. Circ.* 23: 1–113) and Collins (1997, *SSAR Herpetol. Circ.* 25: 1–40) followed this arrangement. Collins (1991, *Herpetol. Rev.* 22: 42–43) was the first use of this binomial. Because no discussion of the taxonomic diagnosis was presented (although Dixon [1959, *Southwest. Nat.* 4: 20–29] found tail length differences between eastern and western groups), we retain *occidentalis* as a nominal subspecies.

***A. elegans* Kennicott, in Baird, 1859—Glossy Snake**

*A. e. arenicola* Dixon, 1960—Texas Glossy Snake



*A. e. candida* Klauber, 1946—Mohave Glossy Snake

The spelling of the standard English name has been changed from “Mojave” to “Mohave” for consistency with other names in the list (see note for *Crotalus scutulatus*).

*A. e. eburnata* Klauber, 1946—Desert Glossy Snake

*A. e. elegans* Kennicott, in Baird, 1859—Kansas Glossy Snake

*A. e. noctivaga* Klauber, 1946—Arizona Glossy Snake

*A. e. occidentalis* Blanchard, 1924—California Glossy Snake

*A. e. philipi* Klauber, 1946—Painted Desert Glossy Snake

***Bogertophis*** Dowling and Price, 1988—DESERT RATSNAKES

Recognition of *Bogertophis* as distinct from *Elaphe* has been corroborated by multiple studies using nuclear and mitochondrial data (Utiger et al, 2002, Russian J. Herpetol. 9: 105–124; Burbrink and Lawson, 2007, Mol. Phylogen. Evolution 43:173-189; Pyron and Burbrink, 2009, 52:524-529). The genus *Bogertophis* is part of the tribe Lampropeltini.

***B. rosaliae*** (Mocquard, 1899)—Baja California Ratsnake

***B. subocularis*** (Brown, 1901)—Trans-Pecos Ratsnake

*B. s. subocularis* (Brown, 1901)—Northern Trans-Pecos Ratsnake

***Carphophis*** Gervais, 1843—NORTH AMERICAN WORMSNAKES

***C. amoenus*** (Say, 1825)—Common Wormsnake

*C. a. amoenus* (Say, 1825)—Eastern Wormsnake

*C. a. helena* (Kennicott, 1859)—Midwestern Wormsnake

***C. vermis*** (Kennicott, 1859)—Western Wormsnake

Clark (1968, Herpetologica 24: 104–112) recommended elevating *C. (a.) vermis* to species status on the basis of allopatry and morphological differences, but Rossman (1973, J. Herpetol. 7: 140–141) presented evidence for the conspecificity of *amoenus* and *vermis* in the form of intergrade populations. Collins (1991, Herpetol. Rev. 22: 42–43) considered *C. vermis* to be distinct from *C. amoenus*, implying that the populations discussed by Rossman were either part of *C. vermis*, or an unnamed taxon. We follow Clark (1968) but anticipate results from molecular studies to better understand population structure and gene flow among allopatric lineages.

***Cemophora*** Cope, 1860—SCARLETSNAKES

No recent studies have examined the taxonomy of this wide-ranging species using morphological (last reviewed by Williams and Wilson, 1967, Tulane Studies in Zoology 13: 103–124) or molecular data.

***C. coccinea*** (Blumenbach, 1788)—Scarletsnake

*C. c. coccinea* (Blumenbach, 1788)—Florida Scarletsnake

*C. c. copei* Jan, 1863—Northern Scarletsnake

*C. c. lineri* Williams, Brown and Wilson, 1966—Texas Scarletsnake

***Charina*** (Gray 1849)—RUBBER BOAS

Kluge (1993, Zool. J. Linn. Soc. 107: 293–351) placed *Lichanura* in the synonymy of *Charina* because they formed sister taxa. Burbrink (2005, Mol. Phylogen. Evo. 34: 167–180) corroborated the relationship found by Kluge. However, Rodríguez-Robles et al. (2001, Mol. Phylogen. Evo. 18: 227–237) found *C. b. umbratica* to represent a

morphologically distinct, allopatric lineage that they elevated to species status based on mitochondrial sequences, along with allozyme data from a previous study (Weisman, 1988, MS Thesis, CSU Polytechnic Pomona). With the recognition of *C. umbratica* and fossil species referred to both *Charina* and *Lichanura* (Holman, 2000, Fossil Snakes of North America, Indiana Univ. Press), neither genus is monotypic, and they are treated here as separate genera.

*C. bottae* (Blainville, 1835)—Northern Rubber Boa

*C. umbratica* Klauber, 1943—Southern Rubber Boa

***Chilomeniscus* Cope, 1860—SANDSNAKES**

Grismer et al. (2002, Herpetologica 58: 18–31) found *C. cinctus*, *C. punctatissimus*, and *C. stramineus* to represent morphotypes of a single species.

*C. stramineus* Cope, 1860—Variable Sandsnake

***Chionactis* Cope, 1860—SHOVEL-NOSED SNAKES**

There is some question as to the validity of the name *C. saxatilis* (Funk, 1967, Southwest Nat. 12: 180), the Gila Mountains Shovel-nosed Snake, which is generally considered to be a synonym of *C. o. annulata* (see Cross, 1978, Ph.D. dissertation, Univ. Arizona). Mahrtdt et al. (2001, Cat. Am. Amph. Rept. 730) considered *C. saxatilis* a synonym of *C. o. annulata*. Wood et al. (2008, Cons. Gen.) demonstrated, using mtDNA and morphological data, that population structure was not concordant with the traditional subspecific taxonomy. They also revealed two potentially, independent evolutionary lineages.

*C. occipitalis* (Hallowell, 1854)—Western Shovel-nosed Snake

*C. o. annulata* (Baird, 1859 “1858”)—Colorado Desert Shovel-nosed Snake

*C. o. klauberi* (Stickel, 1941)—Tucson Shovel-nosed Snake

*C. o. occipitalis* (Hallowell, 1854)—Mohave Shovel-nosed Snake

The spelling of the standard English name has been changed from “Mojave” to “Mohave” for consistency with other names in the list (see note for *Crotalus scutulatus*).

*C. o. talpina* Klauber, 1951—Nevada Shovel-nosed Snake

*C. palarostris* (Klauber, 1937)—Sonoran Shovel-nosed Snake

*C. p. organica* Klauber, 1951—Organ Pipe Shovel-nosed Snake

***Clonophis* Cope, 1889—KIRTLAND’S SNAKES**

*C. kirtlandii* (Kennicott, 1856)—Kirtland’s Snake

***Coluber* Linnaeus, 1758—NORTH AMERICAN RACERS, COACHWHIPS AND WHIPSNAKES**

Nagy et al. (2004, J. Zool. Syst. Evol. Res. 42: 223–233) restricted the genus *Coluber* to the new World and suggested that *Masticophis* might be paraphyletic with respect to *Coluber*. Utiger et al. (2005, Russian J. Herpetol. 12: 39–60) corroborated Nagy et al., finding *Masticophis* to be paraphyletic with respect to *Coluber* and synonymizing *Masticophis* with *Coluber* (the oldest available name). Some data suggest that *Masticophis* is monophyletic (R. Pyron and F. Burbrink, pers. comm.), but we await publication before reconsidering the status of that genus.

*C. bilineatus* (Jan, 1863)—Sonoran Whipsnake

Contrary to Collins (1997, SSAR Herpetol. Circ. 25: 1–40), Camper and Dixon (1994, Ann. Carnegie Mus. Nat. Hist. 63: 1–48) did not recognize any subspecies for *bilineatus*.

***C. constrictor*** Linnaeus, 1758—North American Racer

Fitch et al. (1981, Trans. Kansas Acad. Sci. 84: 196–203) argued for the elevation of *C. c. mormon*. This recommendation was rejected by Greene (1983, J. Herpetol. 18: 210–211), and was supported by Corn and Bury (1986, Herpetologica 42: 258–264), who showed a broad zone of intergradation across Colorado and Utah. Collins (1991, Herpetol. Rev. 22: 42–43) re-elevated *mormon* to specific status, although allopatry was not suitably demonstrated. Anderson (1996, MS thesis, Southeastern Louisiana Univ.) argued that based on allozyme data *C. c. mormon* cannot be differentiated but that *C. c. paludicola* and *C. c. oaxaca* were diagnosable and should be elevated to species status. We retain *C. c. mormon* and await action on *oaxaca* and *paludicola* until the data are published. Burbrink et al. (2008, Mol. Phylogen. Evol. 47:274–288) have demonstrated using mtDNA that *C. constrictor* may be composed of six independently evolving lineages not concordant with most recognized subspecies. In particular, neither *C. c. mormon* or *C. paludicola* represents an evolutionarily distinct lineage. No samples of *C. oaxaca* were included.

*C. c. anthicus* (Cope, 1862)—Buttermilk Racer

*C. c. constrictor* Linnaeus, 1758—Northern Black Racer

*C. c. etheridgei* Wilson, 1970—Tan Racer

*C. c. flaviventris* Say, 1823—Eastern Yellow-bellied Racer

*C. c. foxii* (Baird and Girard, 1853)—Blue Racer

*C. c. helvigularis* Auffenberg, 1955—Brown-chinned Racer

*C. c. latrunculus* Wilson, 1970—Black-masked Racer

*C. c. mormon* Baird and Girard, 1852—Western Yellow-bellied Racer

*C. c. oaxaca* (Jan, 1863)—Mexican Racer

*C. c. paludicola* Auffenberg and Babbitt, 1953—Everglades Racer

*C. c. priapus* Dunn and Wood, 1939—Southern Black Racer

***C. flagellum*** Shaw, 1802—Coachwhip

Mitochondrial data suggests that this species may consist of multiple, independently evolving lineages that are not concordant with currently defined subspecies (R. Pyron and F. Burbrink, *pers. comm.*). However, we retain the traditionally defined subspecies pending publication of these data.

*C. f. cingulum* (Lowe and Woodin, 1954)—Sonoran Coachwhip

*C. f. flagellum* Shaw, 1802—Eastern Coachwhip

*C. f. lineatulus* (Smith, 1941)—Lined Coachwhip

*C. f. piceus* (Cope, 1892)—Red Racer

*C. f. ruddocki* (Brattstrom and Warren, 1953)—San Joaquin Coachwhip

*C. f. testaceus* Say, in James, 1823—Western Coachwhip

***C. fuliginosus*** (Cope, 1895)—Baja California Coachwhip

On the basis of a sympatric occurrence with *C. flagellum*, Grismer (1994, Herpetol. Nat. Hist. 2: 51; 2002, Amphibians and Reptiles of Baja California, Including Its Pacific Islands and the Islands in the Sea of Cortés, Univ. California Press) elevated *C. f. fuliginosus* to species status.

***C. lateralis*** (Hallowell, 1853)—Striped Racer

*C. l. euryxanthus* (Riemer, 1954)—Alameda Striped Racer

*C. l. lateralis* (Hallowell, 1853)—California Striped Racer

**C. schotti** (Baird and Girard, 1853)—Schott's Whipsnake

Camper and Dixon (1994, Ann. Carnegie Mus. Nat. Hist. 63: 1–48) elevated *C. schotti* from *C. taeniatus* with *ruthveni* retained as a subspecies.

*C. s. ruthveni* (Ortenburger, 1923)—Ruthven's Whipsnake

*C. s. schotti* (Baird and Girard, 1853)—Schott's Striped Whipsnake

**C. taeniatus** (Hallowell, 1852)—Striped Whipsnake

*C. t. girardi* (Stejneger and Barbour, 1917)—Central Texas Whipsnake

*C. t. taeniatus* (Hallowell, 1852)—Desert Striped Whipsnake

**Coniophanes** Hallowell, 1860—BLACK-STRIPED SNAKES**C. imperialis** (Baird and Girard, 1859)—Regal Black-striped Snake

*C. i. imperialis* (Baird and Girard, 1859)—Tamaulipan Black-striped Snake

**Contia** Baird and Girard, 1853—SHARP-TAILED SNAKES**C. longicauda** Feldman and Hoyer, 2010—Forest Sharp-tailed Snake

This species was originally named *Contia longicaudae* by Feldman and Hoyer (2010, Copeia, 2010: 254–267); however, because they explicitly treated the second part of the binomen as an adjective, it must agree with the name *Contia* in gender and number so that the correct spelling is *Contia longicauda*.

**C. tenuis** (Baird and Girard, 1852)—Common Sharp-tailed Snake**Crotalus** Linnaeus, 1758—RATTLESNAKES

The traditional view of rattlesnake taxonomy that recognizes the two monophyletic sister genera *Crotalus* and *Sistrurus* (e.g. Brattstrom, 1964, San Diego Soc. Nat. Hist. 13: 185–268) has recently been challenged. Stille (1987, Herpetologica 43: 98–104) and McCranie (1989, Herpetologica 44: 123–126) presented data that suggested *Sistrurus* is not monophyletic and rendered *Crotalus* paraphyletic. Parkinson (1999, Copeia 1999: 576–586) found *Sistrurus* monophyletic but its position rendered *Crotalus* paraphyletic. Knight et al. (1993, Syst. Biol. 42: 356–367) used mtDNA to defend the traditional generic taxonomy, but in order to do so ignored the most parsimonious tree. Murphy et al. (2002, in Schuett et al. [eds.] Biology of the Vipers, Eagle Mountain Publishing, Pp. 69–92) resolved the paraphyly by placing the extralimital taxon *S. ravus* in *Crotalus*. A recent study proposed the division of *Crotalus* and *Sistrurus* into nine genera (Hoser, 2009, Australasian J. Herp. 6: 1–21), though later authors found that this journal did not appear to follow the requirements of the International Code of Zoological Nomenclature, and the revision of *Crotalus* and other genera were thus likely invalid (Wallach et al., 2009, Zootaxa 2236: 26–36).

**C. adamanteus** Palisot de Beauvois, 1799—Eastern Diamond-backed Rattlesnake**C. atrox** Baird and Girard, 1853—Western Diamond-backed Rattlesnake**C. cerastes** Hallowell, 1854—Sidewinder

Douglas et al. (2006, Mol. Ecol. 15: 3353–3374), using mtDNA, found several geographically distinct lineages within *C. cerastes*. Only one of these lineages corresponded to a recognized subspecies. (*C. c. laterorepens*).

**C. c. cerastes** Hallowell, 1854—Mohave Desert Sidewinder

The spelling of the standard English name has been changed from “Mojave” to “Mohave” for consistency with other names in the list (see note for *Crotalus scutulatus*).

*C. c. cercobombus* Savage and Cliff, 1953—Sonoran Sidewinder

*C. c. laterorepens* Klauber, 1944—Colorado Desert Sidewinder

***C. cerberus*** (Coues, 1875)—Arizona Black Rattlesnake

See annotation under *C. oreganus*.

***C. horridus*** Linnaeus, 1758—Timber Rattlesnake

Pisani et al. (1972, *Trans. Kansas Acad. Sci.* 75: 255–263) conducted a multivariate analysis of variation in *C. horridus* and concluded that characters tended to be clinal and recommended against recognition of the two subspecies. Brown and Ernst (1986, *Brimleyana* 12: 57–74) countered that morphology in the eastern part of the range supported recognition of coastal plain and montane subspecies. Clark et al. (2003, *J. Herpetol.* 37: 145–154) identified three mitochondrial DNA lineages separated by the Appalachian and Allegheny Mountain ranges that did not correspond with the classic arrangement of subspecies within *C. horridus*.

***C. lepidus*** (Kennicott, 1861)—Rock Rattlesnake

*C. l. klauberi* Gloyd, 1936—Banded Rock Rattlesnake

*C. l. lepidus* (Kennicott, 1861)—Mottled Rock Rattlesnake

***C. mitchellii*** (Cope, 1861)—Speckled Rattlesnake

*C. m. pyrrhus* (Cope, 1867 “1866”)—Southwestern Speckled Rattlesnake

***C. molossus*** Baird and Girard, 1853—Black-tailed Rattlesnake

*C. m. molossus* Baird and Girard, 1853—Northern Black-tailed Rattlesnake

***C. oreganus*** Holbrook, 1840—Western Rattlesnake

Pook et al. (2000, *Mol. Phylogenet. Evol.* 15: 269–282), Ashton and de Queiroz (2001, *Mol. Phylogenet. Evol.* 21: 176–189), and Douglas et al. (2002, *Biology of the Vipers*, Schuett, Hoggren, Douglas, Greene [eds.] Eagle Mountain Press) analyzed mtDNA sequence data and concluded that *Crotalus viridis* comprised at least two clades, *C. viridis* and *C. oreganus*, with *C. cerberus* being the sister taxon to populations of *C. oreganus*. The former two studies did not formally recognize *C. cerberus* as a species, although both suggested that it was distinct based on sequence differences and allopatry. The latter study did recognize *C. cerberus* as well as four other taxa. Although the studies relied on the same locus, we conservatively conclude that the congruence among all three studies might suggest the recognition of *C. viridis*, *C. oreganus* and *C. cerberus*.

*C. o. abyssus* Klauber, 1930—Grand Canyon Rattlesnake

*C. o. concolor* Woodbury, 1929—Midget Faded Rattlesnake

*C. o. helleri* Meek, 1906 “1905”—Southern Pacific Rattlesnake

*C. o. lutosus* Klauber, 1930—Great Basin Rattlesnake

*C. o. oreganus* Holbrook, 1840—Northern Pacific Rattlesnake

***C. pricei*** Van Denburgh, 1895—Twin-spotted Rattlesnake

The status of the two widely allopatric subspecies (one extralimital) requires reevaluation.

*C. p. pricei* Van Denburgh, 1895—Western Twin-spotted Rattlesnake

***C. ruber*** Cope, 1892—Red Diamond Rattlesnake

The International Commission on Zoological Nomenclature (2000, *Bull. Zool. Nomencl.* 57: 189–190. Opinion 1960) has ruled that the name *Crotalus ruber* Cope 1892 take precedence over *C. exsul* Garman 1884 when used as a specific epithet.

***C. scutulatus*** (Kennicott, 1861)—Mohave Rattlesnake

The spelling of the word “Mojave” or “Mohave” has been a subject of debate. Lowe

in the preface to his “Venomous Reptiles of Arizona” (1986) argued for “Mohave” as did Campbell and Lamar (2004, “The Venomous Reptiles of the Western Hemisphere”). According to linguistic experts on Native American languages, either spelling is correct, but using either the “j” or “h” is based on whether the word is used in a Spanish or English context. Given that this is an English names list, we use the “h” spelling (P. Munro, Linguistics, UCLA, pers. comm.).

*C. s. scutulatus* (Kennicott, 1861)—Northern Mohave Rattlesnake  
The English name of the nominal subspecies has been changed to reflect the distribution rather than describe rattlesnakes from a small portion of its distribution (D. Hardy and H. Greene, pers. comm.).

*C. stephensi* Klauber, 1930—Panamint Rattlesnake  
Elevated to species by Douglas et al. (2007, *Copeia* 2007 (4): 920-932).

*C. tigris* Kennicott, in Baird, 1859—Tiger Rattlesnake

*C. viridis* (Rafinesque, 1818)—Prairie Rattlesnake  
See comments under *C. oreganus*. Douglas et al. (2002, *Biology of the Vipers*, Schuett, Hoggren, Douglas, Greene [eds.] Eagle Mountain Press) synonymized *C. v. nuntius* with *C. v. viridis*.

*C. willardi* Meek, 1906, “1905”—Ridge-nosed Rattlesnake

*C. w. obscurus* Harris and Simmons, 1976—New Mexico Ridge-nosed Rattlesnake

*C. w. willardi* Meek, 1906, “1905”—Arizona Ridge-nosed Rattlesnake

### ***Diadophis* Baird and Girard, 1853—RING-NECKED SNAKES**

***D. punctatus* (Linnaeus, 1766)—Ring-necked Snake**

Numerous data suggest that more than one lineage exists (Blanchard, 1942, *Bull. Chicago Acad. Sci.* 7: 1–144; Gelbach, 1974, *Herpetologica* 30: 140–148; Pinou et al., 1995, *J. Herpetol.* 29: 105–110; Feldman and Spicer, 2006, *Mol. Ecol.* 15: 2201–2222). Using mitochondrial data sampled from specimens across their range, Fontanella et al. (2008, *Mol. Phylogenet. Evol.* 46: 1049-1070) found at least 14 lineages that do not follow the geographic range of the subspecies, and may be independently evolving taxa. While *D. punctatus* may be divided into several species in the near future, we refrain from making any changes at present. Evidence to synonymize the various races into a single species has been poorly presented, and our arrangement follows the traditional subspecies groupings.

*D. p. acricus* Paulson, 1968—Key Ring-necked Snake

*D. p. amabilis* Baird and Girard, 1853—Pacific Ring-necked Snake

*D. p. arnyi* Kennicott, 1859—Prairie Ring-necked Snake

*D. p. edwardsii* (Merrem, 1820)—Northern Ring-necked Snake

*D. p. modestus* Bocourt, 1886—San Bernardino Ring-necked Snake

*D. p. occidentalis* Blanchard, 1923—Northwestern Ring-necked Snake

*D. p. pulchellus* Baird and Girard, 1853—Coral-bellied Ring-necked Snake

*D. p. punctatus* (Linnaeus, 1766)—Southern Ring-necked Snake

*D. p. regalis* Baird and Girard, 1853—Regal Ring-necked Snake

*D. p. similis* Blanchard, 1923—San Diego Ring-necked Snake

*D. p. stictogenys* Cope, 1860—Mississippi Ring-necked Snake

*D. p. vandenburghi* Blanchard, 1923—Monterey Ring-necked Snake

***Drymarchon*** Fitzinger, 1843—INDIGO SNAKES***D. couperi*** (Holbrook, 1842)—Eastern Indigo Snake

Wüster et al. (2001, *Herpetol. J.* 11: 157–165) demonstrated that *couperi* is a distinct species using morphological evidence.

***D. melanurus*** (Duméril, Bibron, and Duméril, 1854)—Central American Indigo Snake

Wüster et al. (2001, *Herpetol. J.* 11: 157–165) showed that the South American *D. corais* is distinct from the Central/North American (*D. melanurus*) taxon.

***D. m. erebennus*** (Cope, 1860)—Texas Indigo Snake***Drymobius*** Fitzinger, 1843—NEOTROPICAL RACERS***D. margaritiferus*** (Schlegel, 1837)—Speckled Racer***D. m. margaritiferus*** (Schlegel, 1837)—Northern Speckled Racer***Farancia*** Gray, 1842—MUDSNAKES AND RAINBOW SNAKES***F. abacura*** (Holbrook, 1836)—Red-bellied Mudsnake

Cundall and Rossman (1984, *Herpetologica* 40: 388–405) analyzed skull morphology and showed substantial divergence between *F. a. abacura* and *F. a. reinwardtii*.

***F. a. abacura*** (Holbrook, 1836)—Eastern Mudsnake***F. a. reinwardtii*** Schlegel, 1837—Western Mudsnake***F. erytrogramma*** (Palisot de Beauvois *in* Sonnini and Latreille, 1801)—Rainbow Snake***F. e. erytrogramma*** (Palisot de Beauvois *in* Sonnini and Latreille, 1801)—Common Rainbow Snake***F. e. seminola*** Neill, 1964—Southern Florida Rainbow Snake***Ficimia*** Gray, 1849—Eastern Hook-nosed Snakes

The previous Standard English names of *Ficimia* and *Gyalopion* were misleading relative to their geographic ranges. All are distributed in Mexico, but *Ficimia* had the moniker “Mexican,” whereas *Gyalopion* had the name “Plateau,” yet is clearly not confined to any plateau. Given that *Ficimia* has the easternmost distribution, we call it “Eastern” and call *Gyalopion* “Western.”

***F. streckeri*** Taylor, 1931—Tamaulipan Hook-nosed Snake***Gyalopion*** Cope, 1861—Western Hook-nosed Snakes

See note on *Ficimia*.

***G. canum*** Cope, 1861 “1860”—Chihuahuan Hook-nosed Snake***G. quadrangulare*** (Günther, 1893 *in* Salvin and Godman, 1885-1902)—Thornscrub Hook-nosed Snake***Heterodon*** Latreille, 1801—North American Hog-nosed Snakes***H. gloydi*** Edgner, 1952—Dusty Hog-nosed Snake

Werler and Dixon (2000, *Texas Snakes*, University of Texas Press, Austin) regarded *H. n. gloydi* to be an allopatric, diagnosable taxon restricted to the low plains - eastern forest ecotone of eastern Texas. Smith et al. (2003, *J. Kansas Herpetol.* 5: 17–20) countered that it was not diagnosable.

***H. kenerlyi*** Kennicott, 1860—Mexican Hog-nosed Snake

Smith et al. (2003, *J. Kansas Herpetol.* 5: 17–20), based on two scale characters, separated *H. n. kenerlyi* from *H. n. nasicus* and elevated the former to species.

***H. nasicus*** Baird and Girard, 1852—Plains Hog-nosed Snake

Because the three subspecies of *H. nasicus* have been elevated to species, their respective standard English names remain associated with each. Hence, there is no longer a “Western Hog-nosed Snake.”

***H. platirhinos*** Latreille, 1801—Eastern Hog-nosed Snake***H. simus*** (Linnaeus, 1766)—Southern Hog-nosed Snake***Hypsiglena*** Cope, 1860—NORTH AMERICAN NIGHTSNAKES

Taxonomy of *Hypsiglena* has received some critical review since Tanner's revision of the genus (1944, *Great Basin Nat.* 5: 25–92). Dixon (1965, *Southwest. Nat.* 10: 125–131) and Dixon and Dean (1986, *Southwest. Nat.* 31: 307–318) studied a morphological contact zone between northern and southern taxa at the Sonora–Sinaloa border in Mexico, finding that it comprised a narrow zone of hybridization with some taxa existing in sympatry. Hardy and McDiarmid (1969, *Univ. Kansas Pub. Mus. Nat. Hist.* 18: 39–252) examined specimens across the range of this presumptive contact and elsewhere in western Mexico and concluded that no morphological characters existed to separate *torquata* and *ochrorhyncha*, except maybe nuchal patterns, which they decided (p. 170) was “a case of pattern dimorphism in a single, otherwise uniform, species.” Grismer et al. (1994, *Bull. So. California Acad. Sci.* 93: 45–80) dismissed the recognition of subspecies in Baja California, stating, without evidence, that the subspecies intergrade widely. Mulcahy (2008, *Mol. Phylogen. Evol.* 46: 1095–1115) conducted a comprehensive phylogeographic study of *Hypsiglena* based on an mtDNA analysis of >150 individuals. Mulcahy (2008) recognized six species in what was considered *H. torquata*, five of which are consistent with previously described lineages (e.g. subspecies), while one represents a unique lineage that remains to be described. Mulcahy (2008) also recommended maintaining the subspecies designations for several of the widespread, polymorphic species, which may represent incipient species. The nominal species *H. torquata* is now restricted to Mexico, three described forms occur in the USA, and the undescribed form is endemic to the Cochise Filter Barrier area of southeastern Arizona and associated New Mexico.

***H. chlorophaea*** Cope, 1860—Desert Nightsnake

*H. c. deserticola* (Tanner, 1944)—Northern Desert Nightsnake

*H. c. loreala* (Tanner, 1944)—Mesa Verde Nightsnake

*H. c. chlorophaea* Cope, 1860—Sonoran Nightsnake

***H. jani*** (Duges, 1866)—Chihuahuan Nightsnake

*H. j. texana* (Stejneger, 1893)—Texas Nightsnake

***H. ochrorhyncha*** Cope, 1860—Coast Nightsnake

*H. o. nuchalata* (Tanner, 1943)—California Nightsnake

*H. o. klauberi* Tanner, 1944—San Diego Nightsnake

***Lampropeltis*** Fitzinger, 1843—KINGSNAKES

The composition of this group was recently investigated by Pyron and Burbrink (2009, *Mol. Phylogen. Evol.* 52: 524–529) and, with exception to *Stilosoma*, the traditionally recognized species within this genus were found to represent a monophyletic group. Reviews of the status of various species and the recognition of additional taxa are forthcoming (F. Burbrink et al., *pers. comm.*).

***L. alterna*** (Brown, 1901)—Gray-banded Kingsnake

Garstka (1982, *Breviora* 466: 1–35) and more recently Bryson et al. (2007, *Mol.*



Phylogenet. Evol. 43: 674–684) reviewed the *mexicana* species group of *Lampropeltis*. Based on the more recent molecular work, it appears that the recognition of the traditional species of *alterna*, *mexicana* and *triangulum* may be incorrect. Until more data are available to resolve the taxonomy of these groups, we withhold making any changes. Given the apparent complexity of the situation and the widespread morphological variation of *L. alterna*, we do not recognize any subspecies, though Hilken and Schleppe (1998, *Salamandra* 34: 97–124) argued for recognition of *L. alterna alterna* and *L. a. blairi*.

***L. californiae*** (Blainville, 1835)—California Kingsnake

Previously considered a subspecies of *L. getula*, Pyron and Burbrink (2009, *Mol. Ecol.* 18: 2443–3457 and 2009, *Zootaxa* 2241: 22–32), demonstrated that this is a distinct species.

***L. calligaster*** (Harlan, 1827)—Yellow-bellied Kingsnake

*L. c. calligaster* (Harlan, 1827)—Prairie Kingsnake

*L. c. occipitolineata* Price, 1987—South Florida Mole Kingsnake

*L. c. rhombomaculata* (Holbrook, 1840)—Mole Kingsnake

***L. elapsoides*** (Holbrook, 1838)—Scarlet Kingsnake

Using multiple nuclear and mitochondrial genes, Pyron and Burbrink (2009, *Mol. Phylogenet. Evol.* 52: 524–529) found that *L. elapsoides* is distinct from *L. triangulum*

***L. extenuata*** (Brown, 1890)—Short-tailed Kingsnake

Dowling and Maxson (1990, *J. Zool. London* 221: 77–85), using immunological distance data, found *Stilosoma* to fall within *Lampropeltis*. Keogh (1996, *Herpetologica* 52: 406–416), however, found *Stilosoma* to be part of the probable sister group to *Lampropeltis*. Rodriguez-Robles and de Jesus Escobar (1999, *Biol. J. Linn. Soc.* 68: 355–385) and Bryson et al. (2007, *Mol. Phylogenet. Evol.* 43: 674–684) corroborated Dowling and Maxson using mtDNA evidence, and demonstrated that recognition of *Stilosoma* as a genus does render *Lampropeltis* paraphyletic. This was confirmed and ameliorated in Pyron and Burbrink (2009, *Mol. Phylogenet. Evol.* 52: 524–529).

***L. getula*** (Linnaeus, 1766)—Eastern Kingsnake

***L. holbrookii*** Stejneger, 1903—Speckled Kingsnake

Formerly considered a subspecies of *L. getula*, Pyron and Burbrink (2009, *Mol. Ecol.* 18: 2443–3457 and 2009, *Zootaxa* 2241: 22–32), demonstrated that this is a distinct species. However, compared to the range of the former subspecies, this taxon occurs only west of the Mississippi River.

***L. knoblochi*** Taylor, 1940—Knobloch’s Mountain Kingsnake

Formerly considered a subspecies of *L. pyromelana*, Burbrink et al. (2011, *Mol. Phylogenet. Evol.* 60: 445–454) demonstrated the existence of two species using coalescent species delimitation methods and ecological niche modeling. The complex comprises a northern species on the Colorado Plateau (*L. pyromelana*) and a southern species (*P. knoblochi*) found primarily on the Sierra Madre Occidental and associated Madrean Sky Islands.

***L. nigra*** (Yarrow, 1882)—Eastern Black Kingsnake

Formerly considered a subspecies of *L. getula*, Pyron and Burbrink (2009, *Mol. Ecol.* 18: 2443–3457 and 2009, *Zootaxa* 2241:22–32), demonstrated that this is a distinct species.

***L. pyromelana*** (Cope, 1867 “1866”)—Pyro Mountain Kingsnake

Burbrink et al. (2011, *Mol. Phylogenet. Evol.* 60: 445–454) demonstrated that this species is distinct from *L. knoblochi*.

*L. p. infralabialis* Tanner, 1953—Utah Mountain Kingsnake

*L. p. pyromelana* (Cope, 1867 “1866”)—Arizona Mountain Kingsnake

***L. splendida*** (Baird and Girard, 1853)—Desert Kingsnake

Formerly considered a subspecies of *L. getula*, Pyron and Burbrink (2009, Mol. Ecol. 18: 2443-3457 and 2009, Zootaxa 2241:22-32), demonstrated that this is a distinct species.

***L. triangulum*** (Lacépède, 1789)—Milksnake

Given molecular evidence from Bryson et al. (2007, Mol. Phylogenet. Evol. 43: 674–684), *L. triangulum* cannot represent a single species if *L. mexicana* and *L. alterna* are recognized. Nuclear and mitochondrial evidence suggest that *L. triangulum* comprises multiple, deeply divergent lineages (S. Ruane et al., *pers. comm.*), though we refrain from making any changes pending publication of those data.

*L. t. amaura* Cope, 1860—Louisiana Milksnake

*L. t. annulata* Kennicott, 1860—Mexican Milksnake

*L. t. celaenops* Stejneger, 1903—New Mexico Milksnake

*L. t. gentilis* (Baird and Girard, 1853)—Central Plains Milksnake

*L. t. multistriata* Kennicott, 1860—Pale Milksnake

*L. t. sypila* (Cope, 1888)—Red Milksnake

*L. t. taylori* Tanner and Loomis, 1957—Utah Milksnake

*L. t. triangulum* (Lacépède, 1789)—Eastern Milksnake

***L. zonata*** (Lockington ex Blainville, 1876)—California Mountain Kingsnake

Rodríguez-Robles et al. (1999, Mol. Ecol. 8: 1923–1934) examined mtDNA and color pattern. The DNA suggested distinct northern and southern clades that they left unnamed, but which may represent independently evolving taxa. The color pattern was too variable to differentiate the seven subspecies. We follow these recommendations and do not recognize any subspecies at this time.

***Leptodeira*** Fitzinger, 1843—CAT-EYED SNAKES***L. septentrionalis*** (Kennicott, *in* Baird, 1859)—Cat-eyed Snake

Campbell (1998, The Amphibians and Reptiles of Northern Guatemala, Yucatán, and Belize, Univ. Oklahoma Press) elevated *L. s. polysticta* to species, which leaves *L. septentrionalis* monotypic.

Leptotyphlops see *Rena*.

***Lichanura*** Cope, 1861—ROSY BOAS

See annotation under *Charina*. Wood et al. (2008, Mol. Phylogenet. Evol. 46: 484–582), used mtDNA and found three main clades within *trivirgata* that do not correspond to currently recognized subspecies. They concluded that these clades corresponded to two species, *L. trivirgata* and *L. orcutti*.

***L. orcutti*** (Stejneger 1889)—Northern Three-lined Boa

***L. trivirgata*** (Cope, 1861)—Rosy Boa

Masticophis: See *Coluber*.

***Micruroides*** Schmidt, 1928—SONORAN CORALSNAKES

Slowinski (1995, J. Herpetol. 29: 325–338) presented morphological and biochemical data supporting separation of the genera *Micrurus* and *Micruroides*. Castoe et al. (2007, Zoo. J. Linn. Soc. 151:809-831) found that *Micruroides* was the sister taxon to the remainder of the sampled New World *Micrurus*.

***M. euryxanthus*** (Kennicott, 1860)—Sonoran Coralsnake

*M. e. euryxanthus* (Kennicott, 1860)—Arizona Coralsnake

***Micrurus*** Wagler, 1824—AMERICAN CORALSNAKES

***M. fulvius*** (Linnaeus, 1766)—Harlequin Coralsnake

***M. tener*** (Baird and Girard, 1853)—Texas Coralsnake

Although Castoe et al. and J. Boundy (2006, Joint Meeting Ichthyologists Herpetologists abstracts) presented molecular and morphological evidence, respectively, that *M. fulvius* and *M. tener* are distinct species, these data have not been published. However, this species has been diagnosed by Campbell and Lamar (2004, in J. A. Campbell and W. W. Lamar [eds.], *Venomous Reptiles of the Western Hemisphere*, Comstock, Publ. Assoc., Ithaca, Pp. 195–197).

*M. t. tener* (Baird and Girard, 1853)—Texas Gulf-Coast Coralsnake

***Nerodia*** Baird and Girard, 1853—NORTH AMERICAN WATERSNAKES

***N. clarkii*** (Baird and Girard, 1853)—Saltmarsh Watersnake

Lawson et al. (1991, *Copeia* 1991: 638–659) presented allozyme data that supported the separation of *clarkii* and *fasciata*.

*N. c. clarkii* (Baird and Girard, 1853)—Gulf Saltmarsh Watersnake

*N. c. compressicauda* Kennicott, 1860—Mangrove Saltmarsh Watersnake

*N. c. taeniata* (Cope, 1895)—Atlantic Saltmarsh Watersnake

Dunson (1979, *Florida Scientist* 42: 102–112) synonymized *N. c. taeniata* with *N. c. compressicauda*, concluding that it was pattern variant of the latter. Lawson et al. (1991, *Copeia* 1991: 638–659) resurrected *N. c. taeniata* on the basis of allozyme data, although the genetic distances were minute.

***N. cyclopion*** (Duméril, Bibron and Duméril, 1854)—Mississippi Green Watersnake

***N. erythrogaster*** (Forster, 1771)—Plain-bellied Watersnake

Makowsky et al. (2010, *Mol. Phylogenet. Evol.* 55: 985–995) demonstrated using mitochondrial data that this taxon represents a single widespread species with no concordance to any of the described subspecies. As such we do not recognize subspecies.

***N. fasciata*** (Linnaeus, 1766)—Southern Watersnake

Allozyme data indicate that *N. fasciata* forms two clades, differentiated on the mid-Florida Panhandle (Lawson et al., 1991, *Copeia* 1991: 638–659). Also see note under *N. sipedon*.

*N. f. confluens* (Blanchard, 1923)—Broad-banded Watersnake

*N. f. fasciata* (Linnaeus, 1766)—Banded Watersnake

*N. f. pictiventris* (Cope, 1895)—Florida Watersnake

***N. floridana*** (Goff, 1936)—Florida Green Watersnake

Elevation of *N. floridana* from a race of *N. cyclopion* is supported by data from Pearson (1966, *Bull. Serol. Mus.* 36: 8), Lawson (1987, *J. Herpetol.* 21: 140–157), and Sanderson (1993, *Brimleyana* 19: 83–94). The disjunct populations of *floridana* were examined by Thompson and Crother (1998, *Copeia* 1998: 715–719) with allozyme data that revealed no evidence of differentiation.

***N. harteri*** (Trapido, 1941)—Brazos River Watersnake

*N. paucimaculata* (Tinkle and Conant, 1961)—Concho Watersnake

Suggested to be separated from *harteri* by Rose and Selcer (1989, J. Herpetol. 23: 261–266) and supported by molecular data in Densmore et al. (1992, Herpetologica 48: 60–68).

***N. rhombifer*** (Hallowell, 1852)—Diamond-backed Watersnake  
Brandley et al. (2010, Mol. Phylogenet. Evol. 57:552–560) found evidence for multiple lineages of *N. rhombifer*. Two lineages were found roughly east and west of the Mississippi River, with a third in Mexico, corresponding to *N. r. werleri*.

*N. r. rhombifer* (Hallowell, 1852)—Northern Diamond-backed Watersnake

***N. sipedon*** (Linnaeus, 1758)—Common Watersnake  
Numerous examples exist of hybridization between *sipedon* and *fasciata* (Conant, 1963, Am. Mus. Novit. 2122: 1–38; Blaney and Blaney, 1979, Herpetologica 35: 350–359; Schwaner et al., 1980, Isozyme Bull. 12: 102; Schwaner and Mount, 1976, Occas. Pap. Mus. Nat. Hist. Univ. Kansas 45: 1–44), although *sipedon* and *fasciata* are apparently not sister taxa (Lawson, 1987, J. Herpetol. 21: 140–157).

*N. s. insularum* (Conant and Clay, 1937)—Lake Erie Watersnake

*N. s. pleuralis* (Cope, 1892)—Midland Watersnake

*N. s. sipedon* (Linnaeus, 1758)—Northern Watersnake

*N. s. williamengelsi* (Conant and Lazell, 1973)—Carolina Watersnake

***N. taxispilota*** (Holbrook, 1838)—Brown Watersnake

### ***Opheodrys*** Fitzinger, 1843—GREENSNAKES

***O. aestivus*** (Linnaeus, 1766)—Rough Greensnake  
Recognition of the Florida peninsular form described by Grobman (1984, Bull. Florida St. Mus. Biol. Sci. 29: 153–170) is supported by Plummer (1987, Copeia 1987: 483–485). Reviewed by Walley and Plummer (2000, Cat. Am. Amph. Rept. 718).

*O. a. aestivus* (Linnaeus, 1766)—Northern Rough Greensnake

*O. a. carinatus* Grobman, 1984—Florida Rough Greensnake

***O. vernalis*** (Harlan, 1827)—Smooth Greensnake  
Given that *Liochlorophis* (Oldham and Smith, 1991, Bull. Maryland Herpetol. Soc. 27: 201–215) is the monotypic sister genus to the monotypic genus *Opheodrys*, recognition of the former taxon is unnecessary, and reduces the amount of information conveyed by the names. As such, we retain *vernalis* in *Opheodrys*. The several subspecies described by Grobman (1941, Misc. Pub. Mus. Zool. Univ. Michigan 50: 1–38; 1992, J. Herpetol. 26: 176–186) are based on character clines and have received little recognition.

### ***Oxybelis*** Wagler, 1830—AMERICAN VINESNAKES

***O. aeneus*** (Wagler, 1824)—Brown Vinesnake

### ***Pantherophis*** Fitzinger, 1843—NORTH AMERICAN RATSNAKES

Utiger et al. (2002, Russian J. Herpetol. 9: 105–124), using molecular data, divided *Elaphe* into eight genera. New World *Elaphe* are part of a clade distinct from Old World species, for which *Pantherophis* Fitzinger, 1843, was resurrected as the oldest available name. Using multiple nuclear and mitochondrial genes, Burbrink and Lawson (2007, Mol. Phylogenet. Evol. 43: 173–189) and Pyron and Burbrink (2009, Mol. Phylogenet. Evol. 52:524–529) demonstrated that the NW *Elaphe* are part of the New World tribe Lampropeltini. While further splitting of *Pantherophis* has been proposed (Collins and Taggart, 2008; J. Kansas Herp. 26:16–18), the use of *Pantherophis* has helped stabilize

the classification of New World ratsnakes for nearly a decade. Thus, we refrain from further division of the genus.

***P. alleghaniensis* (Holbrook, 1836)**—Eastern Ratsnake

See *P. obsoletus*.

***P. bairdi* (Yarrow, in Cope, 1880)**—Baird's Ratsnake

***P. emoryi* (Baird and Girard, 1853)**—Great Plains Ratsnake

Using mitochondrial data, Burbrink (2002, Mol. Phylogenet. Evol. 25: 465–476) found *P. guttatus* to comprise three clades, which were elevated to the species level. The subspecies *P. g. meahllmorum* was not found to be a distinct lineage, and was synonymized with *P. emoryi*.

***P. guttatus* (Linnaeus, 1766)**—Red Cornsnake

Using mitochondrial data, Burbrink (2002, Mol. Phylogenet. Evol. 25: 465–476) found *P. guttatus* to comprise three distinct lineages, which were elevated to species level. The name *P. guttatus* was restricted to populations east of the Mississippi River.

***P. obsoletus* (Say, 1823)**—Western Ratsnake

Based on the congruence of morphological (Burbrink, 2001, Herpetol. Monogr. 15: 1–53) and mitochondrial data (Burbrink et al., 2000, Evolution 54: 2107–2118), Burbrink divided *P. obsoletus* into three species (*P. alleghaniensis*, *P. obsoletus* and *P. spiloides*) with no subspecies.

***P. ramspotti* Crother, White, Savage, Eckstut, Graham and Gardner, 2011**—Western Foxsnake

Conant (1940, Herpetologica 2: 2) recognized two forms of foxsnakes, one on each side of a geographic disjunction (basically all of Michigan and parts of Indiana and Ohio) with the western form as *Pantherophis vulpinus vulpinus* and the eastern form as *P. v. gloydi*. Collins (1991, Herpetol. Rev. 22: 42–43) elevated *gloydi* to specific status because of its geographic disjunction from *vulpinus* and the characters noted by Conant (1940, Herpetologica 2: 2). Crother et al. (2011, ISRN Zoology, doi:10.5402/2011/436049) supported the concept of two species, but discovered that the species boundary was the Mississippi River and not the disjunction. The type locality of *P. vulpinus* is east of the Mississippi River and thus the appropriate available name for the eastern form, leaving the western form unnamed. An interesting side note is that faster evolving microsatellite data reveal a population level separation associated with the geographic hiatus (Row et al., 2011, J Evol. Biol., in press).

***P. slowinskii* Burbrink, 2002**—Slowinski's Cornsnake

Using mitochondrial data, Burbrink (2002, Mol. Phylogenet. Evol. 25: 465–476) found *P. guttatus* to comprise three distinct lineages, which were elevated to species level. The populations in western Louisiana and eastern Texas were named *P. slowinskii*.

***P. spiloides* (Duméril, Bibron and Duméril, 1854)**—Gray Ratsnake

See comment under *P. obsoletus*.

***P. vulpinus* (Baird and Girard, 1853)**—Eastern Foxsnake

See comment under *P. ramspotti*.

***Pelamis* Daudin, 1803**—Yellow-bellied Seasnakes

***P. platura* (Linnaeus, 1766)**—Yellow-bellied Seasnake

The correct spelling of the specific epithet is *platura* because *Pelamis* is feminine (Lanza and Boscherini, 2000, Tropical Zoology 13: 327–329; Böhme, 2003, Salamandra 39: 124).

***Phyllorhynchus*** Stejneger, 1890 LEAF-NOSED SNAKES***P. browni*** Stejneger, 1890—Saddled Leaf-nosed Snake***P. decurtatus*** (Cope, 1868)—Spotted Leaf-nosed Snake

McDiarmid and McCleary (1993, *Cat. Am. Amph. Rept.*: 579.1–5), argued that the four subspecies of *P. browni* and five subspecies of *P. decurtatus* not be recognized. Gardner and Mendelson (2004, *J. Herpetol.* 38: 187–196), based on morphological data, also concluded that subspecies of *P. decurtatus* should not be recognized.

***Pituophis*** Holbrook, 1842—BULLSNAKES, PINESNAKES, AND GOPHERSNAKES

Using mitochondrial data, Rodríguez-Robles et al. (2000, *Mol. Phylogenet. Evol.* 14: 35–50) corroborated the current classification of United States *Pituophis* into three species: *melanoleucus*, *catenifer*, and *ruthveni*. However, the recognition of *ruthveni* rendered *catenifer* paraphyletic. Thus, given further study of this group, *Pituophis* may undergo taxonomic revision in the near future.

***P. catenifer*** (Blainville, 1835)—Gophersnake

Rodríguez-Robles et al. (2000, *Mol. Phylogenet. Evol.* 14: 35–50) discovered significant internal structuring among *P. catenifer* populations using mitochondrial data, which may signify the existence of additional species, though they did not attempt reclassification. Pending further study, we retain the present subspecific designations for the group.

*P. c. affinis* (Hallowell, 1852)—Sonoran Gophersnake*P. c. annectens* Baird and Girard, 1853—San Diego Gophersnake*P. c. catenifer* (Blainville, 1835)—Pacific Gophersnake*P. c. deserticola* Stejneger, 1893—Great Basin Gophersnake*P. c. pumilus* Klauber, 1946—Santa Cruz Island Gophersnake*P. c. sayi* (Schlegel, 1837)—Bullsnake***P. melanoleucus*** (Daudin, 1803)—Pinesnake*P. m. lodingi* Blanchard, 1924—Black Pinesnake*P. m. melanoleucus* (Daudin, 1803)—Northern Pinesnake*P. m. mugitus* Barbour, 1921—Florida Pinesnake***P. ruthveni*** Stull, 1929—Louisiana Pinesnake

Reichling (1995, *J. Herpetol.* 29: 186–198) concluded that *ruthveni* is a distinct species. Rodríguez-Robles et al. (2000, *Mol. Phylogenet. Evol.* 14: 35–50) argued for the recognition of *P. ruthveni*, despite lack of significant or independent differentiation from some populations of *P. c. sayi* using mitochondrial data.

***Regina*** Baird and Girard, 1853—CRAYFISH SNAKES

Alfaro and Arnold (2001, *Mol. Phylogenet. Evol.* 21: 408–423) used DNA sequence data and found the genus to be polyphyletic. This conclusion corroborates the allozyme-based hypothesis of Lawson (1985, Ph.D. dissertation, Louisiana State University). Taxonomic change is necessary for this genus, but Alfaro and Arnold recommended against such change pending further investigation of New World natricine relationships.

***R. alleni*** (Garman, 1874)—Striped Crayfish Snake***R. grahamii*** Baird and Girard, 1853—Graham's Crayfish Snake***R. rigida*** (Say, 1825)—Glossy Crayfish Snake*R. r. deltae* (Huheey, 1959)—Delta Crayfish Snake*R. r. rigida* (Say, 1825)—Glossy Crayfish Snake

- R. r. sinicola* (Huheey, 1959)—Gulf Crayfish Snake  
*R. septemvittata* (Say, 1825)—Queensnake

***Rena*** Baird and Girard, 1853—THREADSNAKES

Adalsteinsson et al. (2009, *Zootaxa* 2224: 1-50) demonstrated that the former genus *Leptotyphlops* was composed of two large clades each composed Old World or New World taxa. The type for the genus *Leptotyphlops* is associated with Old World taxa, leaving the clade of North and Central American threadsnakes unnamed. The genus *Rena* has been restored to this group.

- R. dissectus* (Cope, 1896)—New Mexico Threadsnake  
 See *R. dulcis*.

*R. dulcis* (Baird and Girard, 1853)—Texas Threadsnake  
 Dixon and Vaughan (2003, *Texas J. Sci.* 55: 3–24), using morphological data, elevated *R. d. dissectus* to species status, and diagnosed three subspecies within the nominate race, one of which remains unnamed.

- R. d. dulcis* (Baird and Girard, 1853)—Plains Threadsnake  
*R. d. rubellum* (Garman, 1884)—South Texas Threadsnake  
***R. humilis*** (Baird and Girard, 1853)—Western Threadsnake  
*R. h. cahuilae* Klauber, 1931—Desert Threadsnake  
*R. h. humilis* (Baird and Girard, 1853)—Southwestern Threadsnake  
*R. h. segregus* Klauber, 1939—Trans-Pecos Threadsnake  
*R. h. utahensis* Tanner, 1938—Utah Threadsnake

***Rhadinaea*** Cope, 1863—LITTERSNAKES

- R. flavilata* (Cope, 1871)—Pine Woods Littersnake

***Rhinocheilus*** Baird and Girard, 1853—LONG-NOSED SNAKES

*R. lecontei* Baird and Girard, 1853—Long-nosed Snake  
 Manier (2004, *Biol. J. Linn. Soc.*, 83: 65–85), in a detailed morphological analysis, concluded that no subspecies should be recognized.

***Salvadora*** Baird and Girard, 1853—PATCH-NOSED SNAKES

- S. grahamiae*** Baird and Girard, 1853—Eastern Patch-nosed Snake  
*S. g. grahamiae* Baird and Girard, 1853—Mountain Patch-nosed Snake  
*S. g. lineata* Schmidt, 1940—Texas Patch-nosed Snake  
***S. hexalepis*** (Cope, 1866)—Western Patch-nosed Snake  
*S. h. deserticola* Schmidt, 1940—Big Bend Patch-nosed Snake

Recognition of the species *S. deserticola* was made without justification by Bogert and Degenhardt (1961, *Am. Mus. Novit.* 2064: 13). Bogert (1985, *Snake Syst. Newsl.* Nov. no. 3) explained that the usage was based on characters discovered previously (Bogert, 1945, *Am. Mus. Novit.* 1285: 1–14) and on the absence of any intergrades. Although Bogert may be correct, we await a study to demonstrate it and retain *S. h. deserticola* as a subspecies of *S. hexalepis*.

- S. h. hexalepis* (Cope, 1866)—Desert Patch-nosed Snake  
*S. h. mojavensis* Bogert, 1945—Mohave Patch-nosed Snake

The spelling of the standard English name has been changed from “Mojave” to “Mohave” for consistency with other names in the list (see note for *Crotalus scutulatus*).

*S. h. virgultea* Bogert, 1935—Coast Patch-nosed Snake

***Seminatrix*** Cope, 1895—BLACK SWAMPSNAKES

***S. pygaea*** (Cope, 1871)—Black Swampsnake

*S. p. cyclas* Dowling, 1950—Southern Florida Swampsnake

*S. p. paludis* Dowling, 1950—Carolina Swampsnake

*S. p. pygaea* (Cope, 1871)—Northern Florida Swampsnake

***Senticolis*** Dowling and Fries, 1987—GREEN RATSNAKES

*Senticolis* is more closely related to the New World tribe Lampropeltini than it is to the Old World genus *Elaphe* (Keogh, 1996, *Herpetologica* 52: 406–416; Utiger et al., 2002, *Russian J. Herpetol.* 9: 105–124; Burbrink and Lawson, 2007, *Mol. Phylogenet. Evol.* 43: 173–189 and Pyron and Burbrink, 2009, *Mol. Phylogenet. Evol.* 52: 524–529)

***S. triaspis*** (Cope, 1866)—Green Ratsnake

*S. t. intermedia* (Boettger, 1883)—Northern Green Ratsnake

***Sistrurus*** Garman, 1883—MASSASAUGA AND PYGMY RATTLESNAKES

See note under *Crotalus*.

***S. catenatus*** (Rafinesque, 1818)—Massasauga

Kubatko et al. (2011 *Syst. Biol.* 60) used a multigene data set to infer two clades among the three previously recognized subspecies. One clade contained the eastern subspecies (*S. c. catenatus*) and the other clade contained the two western subspecies (*S. c. tergeminus* and *S. c. edwardsii*). Kubatko et al. (op. cit.) recommended elevating *S. c. catenatus*. However, if the recommendation is followed, it would also require elevating *S. c. tergeminus* and the formation of three new combinations. In addition, Holycross et al. (2008, *Copeia*, 2008: 421–424) discovered that *S. c. tergeminus* is actually subsumed by *S. c. catenatus* because the type locality of *catenatus* is within the range of *tergeminus*, and that the name *Crotalus massassaugus* Kirtland, 1838 would be the available and valid name for the eastern subspecies. As such, *tergeminus* is not currently a valid name and if the Kubatko et al. recommendation is followed, the specific epithet for the eastern form would be *massassaugus*. A petition to the ICZN (Crother et al., in review) to retain the names *catenatus* and *tergeminus* and to allow the designation of a neotype of *S. catenatus* and *S. tergeminus* has been submitted. Therefore, we await a full peer reviewed taxonomic treatment of this group before recommending a new taxonomy.

*S. c. catenatus* (Rafinesque, 1818)—Eastern Massasauga

*S. c. edwardsii* (Baird and Girard, 1853)—Desert Massasauga

*S. c. tergeminus* (Say, 1823)—Western Massasauga

***S. miliarius*** (Linnaeus, 1766)—Pygmy Rattlesnake

*S. m. barbouri* Gloyd, 1935—Dusky Pygmy Rattlesnake

Gloyd (1935, *Occ. Papers Mus. Zool. Univ. Michigan* 322: 1–7) found *S. m. barbouri* distinct from the other two races by having the lateral spots in 3 series vs. 1–2 series for the other two.

*S. m. miliarius* (Linnaeus, 1766)—Carolina Pygmy Rattlesnake

*S. m. streckeri* Gloyd, 1935—Western Pygmy Rattlesnake



***Sonora*** Baird and Girard, 1853—NORTH AMERICAN GROUNDSNAKES***S. semiannulata*** Baird and Girard, 1853—Western Groundsnake*S. s. semiannulata* Baird and Girard, 1853—Variable Groundsnake*S. s. taylori* (Boulenger, 1894)—Southern Texas Groundsnake***Storeria*** Baird and Girard, 1853—NORTH AMERICAN BROWNSNAKES***S. dekayi*** (Holbrook, 1836)—Dekay's Brownsnake*S. d. dekayi* (Holbrook, 1836)—Northern Brownsnake*S. d. limnetes* Anderson, 1961—Marsh Brownsnake*S. d. texana* Trapido, 1944—Texas Brownsnake*S. d. wrightorum* Trapido, 1944—Midland Brownsnake***S. occipitamaculata*** (Storer, 1839)—Red-bellied Snake*S. o. obscura* Trapido, 1944—Florida Red-bellied Snake*S. o. occipitamaculata* (Storer, 1839)—Northern Red-bellied Snake

No evidence of separate lineages has been found between the sympatric brown and grey color morphs (Grudzien and Owens, 1991, *J. Herpetol.* 25: 90–92).

*S. o. pahasapae* Smith, 1963—Black Hills Red-bellied Snake***S. victa*** Hay, 1892—Florida Brownsnake

Christman (1980, *Bull. Florida St. Mus.* 25: 157–256) presented evidence, allopatric with no morphological convergence in proximal populations, to suggest species status for *victa*.

***Tantilla*** Baird and Girard, 1853—BLACK-HEADED, CROWNED, AND FLAT-HEADED SNAKES***T. atriceps*** (Günther, 1895 in Salvin and Godman, 1885–1902)—Mexican Black-headed Snake***T. coronata*** Baird and Girard, 1853—Southeastern Crowned Snake***T. cucullata*** Minton, 1956—Trans-Pecos Black-headed Snake

The taxonomic status of *T. cucullata* and *T. diabola* has been problematic. They have been alternately synonymized (Degenhardt et al., 1976, *Texas J. Sci.* 17: 225–234; Hillis and Campbell, 1982, *Southwest. Nat.* 27: 220–221; Irwin and Collins, 1995, *Herpetol. Rev.* 26: 47) or elevated to species (Collins, 1991, *Herpetol. Rev.* 22: 42–43). We follow the most recent proposals from Wilson (1999, *Smithsonian Inform. Serv.* 122: 1–34) and Dixon et al. (2000, *Southwest Nat.* 45) who both recognized *T. cucullata* as a species distinct from *T. rubra* (extralimital) and synonymized *T. diabola* with the former.

***T. gracilis*** Baird and Girard, 1853—Flat-headed Snake***T. hobartsmithi*** Taylor, 1937—Smith's Black-headed Snake***T. nigriceps*** Kennicott, 1860—Plains Black-headed Snake***T. oolitica*** Telford, 1966—Rim Rock Crowned Snake***T. planiceps*** (Blainville, 1835)—Western Black-headed Snake

Cole and Hardy (1981, *Bull. Am. Mus. Nat. Hist.* 17: 201–284) noted local geographic variation but did not recognize any available subspecies of the many disjunct populations.

***T. relicta*** Telford, 1966—Florida Crowned Snake*T. r. neilli* Telford, 1966—Central Florida Crowned Snake*T. r. pamlica* Telford, 1966—Coastal Dunes Crowned Snake*T. r. relicta* Telford, 1966—Peninsula Crowned Snake

***T. wilcoxi*** Stejneger, 1903—Chihuahuan Black-headed Snake

***T. yaquia*** Smith, 1942—Yaqui Black-headed Snake

***Thamnophis*** Fitzinger, 1843—NORTH AMERICAN GARTERSNAKES

The specific and infraspecific status of the taxa listed below is based on Rossman et al. (1996, *The Garter Snakes: Evolution and Ecology*, Univ. Oklahoma Press).

***T. atratus*** (Kennicott, 1860)—Aquatic Gartersnake

Rossman and Stewart (1987, *Occ. Pap. Mus. Zool. Louisiana St. Univ.* 63: 1–25) recognized *atratus* as distinct from *T. couchii* and recommended against recognizing *T. a. aquaticus*.

*T. a. atratus* (Kennicott, 1860)—Santa Cruz Gartersnake

*T. a. hydrophilus* Fitch, 1936—Oregon Gartersnake

*T. a. zaxanthus* Boundy, 1999—Diablo Range Gartersnake

***T. brachystoma*** (Cope, 1892)—Short-headed Gartersnake

***T. butleri*** (Cope, 1889)—Butler's Gartersnake

***T. couchii*** (Kennicott, 1859)—Sierra Gartersnake

***T. cyrtopsis*** (Kennicott, 1860)—Black-necked Gartersnake

*T. c. cyrtopsis* (Kennicott, 1860)—Western Black-necked Gartersnake

*T. c. ocellatus* (Cope, 1880)—Eastern Black-necked Gartersnake

***T. elegans*** (Baird and Girard, 1853)—Terrestrial Gartersnake

Using mitochondrial data, Bronikowski and Arnold (2001, *Copeia* 2001: 508–513) identified several clades within *T. elegans* that did not, in some cases, follow phenotypic subspecies boundaries. Hammerson (1999, *Amphibians and Reptiles of Colorado*, 2nd ed. University of Colorado Press, Boulder) found phenotypes assignable to *T. e. arizonae* and *T. e. vascoanneri* outside of their purported distributions within Colorado, and recommended that the two names be synonymized with *T. e. vagrans*. Hammerson's data supported similar action for Arizona and New Mexico populations as well (J. Boundy, pers. obs.). Thus, we tentatively retain three subspecies.

*T. e. elegans* (Baird and Girard, 1853)—Mountain Gartersnake

*T. e. terrestris* Fox, 1951—Coast Gartersnake

*T. e. vagrans* (Baird and Girard, 1853)—Wandering Gartersnake

***T. eques*** (Reuss, 1834)—Mexican Gartersnake

*T. e. megalops* (Kennicott, 1860)—Brown Gartersnake

***T. gigas*** Fitch, 1940—Giant Gartersnake

***T. hammondi*** (Kennicott, 1860)—Two-striped Gartersnake

The extralimital *T. digueti* was synonymized with *T. hammondi* by McGuire and Grismer (1993, *Herpetologica* 49: 354–365).

***T. marcianus*** (Baird and Girard, 1853)—Checkered Gartersnake

*T. m. marcianus* (Baird and Girard, 1853)—Marcy's Checkered Gartersnake

***T. ordinooides*** (Baird and Girard, 1852)—Northwestern Gartersnake

***T. proximus*** (Say, 1823)—Western Ribbonsnake

*T. p. diabolicus* Rossman, 1963—Arid Land Ribbonsnake

*T. p. orarius* Rossman, 1963—Gulf Coast Ribbonsnake

*T. p. proximus* (Say, 1823)—Orange-striped Ribbonsnake

*T. p. rubrilineatus* Rossman, 1963—Red-striped Ribbonsnake

***T. radix*** (Baird and Girard, 1853)—Plains Gartersnake

***T. rufipunctatus*** (Cope, 1875)—Narrow-headed Gartersnake

Based on scale microstructure, Chiasson and Lowe (1989, *J. Herpetol.* 23: 109–118) suggested this taxon be moved from *Thamnophis* to *Nerodia*. De Queiroz and Lawson (1994, *Biol. J. Linn. Soc.* 53: 209–229) rejected the suggested reallocation, based on their finding that *rufipunctatus* is nested within *Thamnophis*.

***T. sauritus*** (Linnaeus, 1766)—Eastern Ribbonsnake

*T. s. nitae* Rossman, 1963—Blue-striped Ribbonsnake

*T. s. sackenii* (Kennicott, 1859)—Peninsula Ribbonsnake

*T. s. sauritus* (Linnaeus, 1766)—Common Ribbonsnake

*T. s. septentrionalis* Rossman, 1963—Northern Ribbonsnake

***T. sirtalis*** (Linnaeus, 1758)—Common Gartersnake

Analyses of mitochondrial data suggest that this species may be composed of multiple independently evolving lineages often not concordant with the subspecific taxonomy (F. Burbrink, *pers. comm.*).

*T. s. annectens* Brown, 1950—Texas Gartersnake

*T. s. concinnus* (Hallowell, 1852)—Red-spotted Gartersnake

*T. s. dorsalis* (Baird and Girard, 1853)—New Mexico Gartersnake

*T. s. fitchi* Fox, 1951—Valley Gartersnake

*T. s. infernalis* (Blainville, 1835)—California Red-sided Gartersnake

The International Commission on Zoological Nomenclature (2000, *Bull. Zool. Nomencl.* 57: 191–192, Opinion 1961) has ruled that the name *Coluber infernalis* be re-associated with Pacific Coast populations referred to as *T. s. concinnus* by Crother et al. (2000, *Herpetol. Circular* 29: 73), as suggested by Boundy and Rossman (1995, *Copeia* 1995: 236–240).

*T. s. pallidulus* Allen, 1899—Maritime Gartersnake

*T. s. parietalis* (Say, 1823)—Red-sided Gartersnake

*T. s. pickeringii* (Baird and Girard, 1853)—Puget Sound Gartersnake

*T. s. semifasciatus* Cope, 1892—Chicago Gartersnake

Benton (1980, *Zool. J. Linnaean Soc.* 68: 307–323) synonymized *T. s. semifasciatus* with the nominate race, but Rossman et al. (1996, *The Gartersnakes. Evolution and Ecology*, Univ. Oklahoma Press) resurrected *T. s. semifasciatus*.

*T. s. similis* Rossman, 1965—Blue-striped Gartersnake

*T. s. sirtalis* (Linnaeus, 1758)—Eastern Gartersnake

*T. s. tetrataenia* (Cope, 1875)—San Francisco Gartersnake

Action by the International Commission on Zoological Nomenclature (2000, *Bull. Zool. Nomencl.* 57: 191–192, Opinion 1961) has retained the name *Eutaenia s. tetrataenia* for San Francisco Peninsula populations of *T. sirtalis*.

***Trimorphodon*** Cope, 1861—LYRESNAKES

Devitt et al. (2008, *Copeia* 2008: 370–387) recognized six species (three extralimital), including *T. lambda* and *T. lyrophanes* based on morphological and mitochondrial data.

***T. lambda*** Cope, 1886—Sonoran Lyresnake

***T. lyrophanes*** (Cope, 1860)—California Lyresnake

***T. vilkinsonii*** Cope, 1886—Texas Lyresnake

LaDuc and Johnson (2003, *Herpetologica* 59: 364–374) re-elevated *T. vilkinsonii* to species status.

***Tropidoclonion*** Cope, 1860—LINED SNAKES***T. lineatum*** (Hallowell, 1856)—Lined SnakeSee comments under *Virginia*.***Virginia*** Baird and Girard, 1853—NORTH AMERICAN EARTHSNAKES***V. striatula*** (Linnaeus, 1766)—Rough Earthsnake***V. valeriae*** Baird and Girard, 1853—Smooth Earthsnake*V. v. elegans* Kennicott, 1859—Western Smooth Earthsnake*V. v. valeriae* Baird and Girard, 1853—Eastern Smooth Earthsnake*V. v. pulchra* (Richmond, 1954)—Mountain Earthsnake

Lawson (1985, Ph.D. dissertation, Louisiana St. Univ.) argued for the possibility that *Virginia* is paraphyletic with respect to *Tropidoclonion* and suggested expanding the genus *Virginia* to include *Tropidoclonion lineatum*. Collins (1991, *Herpetol. Rev.* 22: 42–43) elevated *pulchra* to specific status. Because no supporting data, aside from allopatric distribution, were published in his list, we retain *V. valeriae pulchra*.

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***Crocodylia—CROCODYLIANS***


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***Alligator*** Cuvier, 1807—ALLIGATORS***A. mississippiensis*** (Daudin, 1802 “1801”)—American Alligator***Crocodylus*** Laurenti, 1768—CROCODYLES***C. acutus*** Cuvier, 1807—American Crocodile

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*Testudines—Turtles*


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***Actinemys* Agassiz, 1857—WESTERN POND TURTLES**

See note under Clemmys.

***A. marmorata*** (Baird and Girard, 1852)—Western Pond Turtle  
Spinks and Shaffer (2005, Mol. Ecol. 14: 2047–2064) have argued that the previously recognized subspecies *A. m. pallida* is not supported on molecular grounds and hence should be abandoned. However, more recent work (Spinks et al., 2010, Mol. Ecol. 19: 542–556) demonstrated deep phylogeographic divergence within the species, potentially warranting species recognition.

***Apalone* Rafinesque, 1832—NORTH AMERICAN SOFTSHELLS**

The generic name *Apalone* Rafinesque was resurrected by Meylan (1987, Bull. Am. Mus. Nat. Hist. 186: 1–101) for the monophyletic group of softshell turtles consisting of *Apalone ferox*, *A. mutica* and *A. spinifera* that was identified by a phylogenetic analysis of living softshells. Meylan’s revised taxonomy has been widely adopted (e.g., Iverson, 1992, A Revised Checklist with Distribution Maps of the Turtles of the World, Privately printed; Conant and Collins, 1992, A Field Guide to Reptiles and Amphibians: Eastern and Central North America, Houghton Mifflin Co.; Collins, 1997, SSAR Herpetol. Circ. 25; Ernst and Barbour, 1989, Turtles of the World, Smithsonian Instit. Press). Authors who continue to use *Trionyx* for species of *Apalone* (e.g., Ernst et al., 1994, Turtles of the United States and Canada, Smithsonian Instit. Press; Plummer, 1997, Chel. Conserv. Biol. 2: 514–520) cite Webb, (1990, Cat. Am. Amphib. Rept. 487: 1–7) who considered that “total acceptance of his [Meylan, 1987, op cit.] classification is premature.” However, no alternative hypothesis of relationships for these species or alternative taxonomy has been offered. To our knowledge, there is no evidence that *Apalone* is not monophyletic (e.g., see Engstrom et al., 2004, Syst. Biol. 53: 693–711). In addition, as pointed out by Meylan (1996, Herpetol. Rev. 27: 41–42), the North American softshells are distinctive morphologically and biologically, and diverged from their closest relatives during the Cretaceous (Gardiner et al., 1995, Can. J. Earth Sci. 32: 631–643). The content of *Apalone* basically follows Webb (1962, Univ. Kansas Publ. Mus. Nat. Hist. 13: 429–611).

***A. ferox*** (Schneider, 1783)—Florida Softshell

***A. mutica*** (LeSueur, 1827)—Smooth Softshell

*A. m. mutica* (LeSueur, 1827)—Midland Smooth Softshell

*A. m. calvata* (Webb, 1959)—Gulf Coast Smooth Softshell

***A. spinifera*** (LeSueur, 1827)—Spiny Softshell

*A. s. spinifera* (LeSueur, 1827)—Eastern Spiny Softshell

*A. s. aspera* (Agassiz, 1857)—Gulf Coast Spiny Softshell

*A. s. emoryi* (Agassiz, 1857)—Texas Spiny Softshell

*A. s. guadalupensis* (Webb, 1962)—Guadalupe Spiny Softshell

*A. s. pallida* (Webb, 1962)—Pallid Spiny Softshell

Content follows McGaugh et al. (2008, *Zoologica Scripta* 37: 289-304), who synonymized *A. s. hartwegi* with *A. s. spinifera*.

### ***Caretta*** Rafinesque, 1814—LOGGERHEAD SEA TURTLES

This comment applies to all the standard English names of the sea turtles listed herein.

We have returned to the use of “sea turtles” (rather than “seaturtles”) as part of the standard English name for marine turtles. The combined name has not been used recently in the literature.

***C. caretta*** (Linnaeus, 1758)—Loggerhead Sea Turtle

### ***Chelonia*** Brongniart, 1800—GREEN SEA TURTLES

See note under *Caretta*.

***C. mydas*** (Linnaeus, 1758)—Green Sea Turtle

The Black Turtle of the Pacific Ocean has been considered a separate species (*Chelonia agassizii*) by some authors (e.g., Pritchard and Trebbau, 1984, *SSAR Contrib. Herpetol.* 2: 1–403), a subspecies of *Chelonia mydas* by others (Kamezaki and Matsui, 1995, *J. Herpetol.* 29: 51–60), and synonymous with *Chelonia mydas* by others (e.g., Bowen et al., 1992, *Evolution* 46: 865–881). We follow Parham and Zug (1996, *Marine Turtle Newsl.* 72: 2–5) and Karl and Bowen (1999, *Cons. Biol.* 13: 990–999) in not recognizing it taxonomically until more work is done.

### ***Chelydra*** Schweigger, 1812—SNAPPING TURTLES

***C. serpentina*** (Linnaeus, 1758)—Snapping Turtle

This species has previously been called the Common Snapping Turtle (e.g., Collins, 1997, *SSAR Herpetol. Circ.* 25), but the adjective has been dropped because it might be misinterpreted as referring to the abundance of the species rather than to its being the typical, most widespread species of its family. Shaffer et al. (2008; *Biology of the Snapping Turtle*, John Hopkins Univ. Press.) provided convincing genetic evidence that *C. serpentina* is a “single, virtually invariant lineage” and hence abandoned the recognition of the subspecies *C. s. osceola* Stejneger, 1918.

### ***Chrysemys*** Gray, 1844—PAINTED TURTLES

We follow Vogt and McCoy (1980, *Ann. Carnegie Mus. Nat. Hist.* 49: 93–102) and Seidel and Smith (1986, *Herpetologica* 42: 242–248) in restricting this genus to the painted turtle complex. Starkey et al. (2003, *Evolution* 57: 119–128) have argued that the southern painted turtle is genetically divergent and hence should be elevated to the species level. They also questioned the recognition of the remaining subspecies on genetic grounds, but did not take a position on their abandonment. However, Ernst et al. (2006, *Herpetol. Bull.* 95: 6–15) reexamined color patterns and dorsal scute alignment in *Chrysemys* and identified intermediate specimens between *C. dorsalis* and *C. p. marginata* and *C. p. bellii*. Based on these findings Fritz and Havas (2007, *Checklist of Chelonians of the World*, Museum of Zoology, Dresden) returned *dorsalis* to subspecies rank under *C. picta*. Until this conflict between genetic and color pattern data can be resolved, we rely on the genetic data and continue to recognize *dorsalis* as a full species.

***C. picta*** (Schneider, 1783)—Painted Turtle

***C. p. bellii*** (Gray, 1831)—Western Painted Turtle

- C. p. marginata* Agassiz, 1857—Midland Painted Turtle  
*C. p. picta* (Schneider, 1783)—Eastern Painted Turtle  
*C. dorsalis* Agassiz, 1857—Southern Painted Turtle

***Clemmys*** Ritgen, 1828—SPOTTED TURTLES

Work by Bickham et al. (1996, *Herpetologica* 52: 89–97), Burke et al. (1996, *Herpetologica* 52: 572–584), Lenk et al. (1999, *Mol. Ecol.* 8: 1911–1922), Holman and Fritz (2001, *Zoolog. Abhand. Staat. Mus. für Tierkunde Dresden* 51: 331–354), Feldman and Parham (2002, *Mol. Phylogenet. Evol.* 22: 388–398), Seidel (2002, *Copeia* 2002: 1118–1121), Stephens and Wiens (2003, *Biol. J. Linn. Soc.* 79: 577–610), Wiens et al. (2010, *Biol. J. Linn. Soc.* 99: 445–461), and Fritz et al. (2011, *Zootaxa* 2791: 41–53) provided ample evidence that the genus *Clemmys* as previously recognized (e.g., McDowell, 1964, *Proc. Zool. Soc. Lond.* 143: 239–279) was paraphyletic with respect to the sister genera *Emys* and *Emydoidea*, and also possibly *Terrapene*. Two taxonomic schemes reflecting these relationships are currently in contention. Both would place sister taxa *insculpta* and *muhlenbergii* in the genus *Glyptemys* and leave *guttata* in the monotypic genus *Clemmys* (both changes are recognized in this list). However, one scheme (e.g., Feldman and Parham, 2002, *op. cit.*; Spinks and Shaffer, 2005, *Mol. Ecol.* 14: 2047–2064) would expand the definition of *Emys* to include *marmorata*, *blandingii*, *orbicularis* (European) and *trinacris* (Sicilian). This would involve two taxonomic changes and eliminate the genus *Emydoidea*, which is monotypic as a living taxon, but polytypic if the fossil record is included (Holman, 2002, *Michigan Academician* 34: 393–394). The other scheme (Holman and Fritz, *op. cit.*; Stephens and Wiens, 2003, *op. cit.*; Wiens et al. 2010, *op. cit.*; Fritz et al. 2011, *op. cit.*) involves only one taxonomic change, placing *marmorata* in the monotypic genus *Actinemys* (but see Spinks and Shaffer, 2005, *op. cit.*, and Spinks et al., 2010, *Mol. Ecol.* 19: 542–556, who suggest polytypy in this genus), and retaining the polytypic genus *Emydoidea*, and the polytypic genus *Emys* (for the European forms). The contention hinges on the relative importance of eliminating monotypic genera versus maintaining taxonomic stability (fewer changes being preferable). The former is supported primarily by taxonomists who consider monotypic genera to be redundant names and hence of no value in providing phylogenetic information. Thus, although the former scheme requires more changes, it eliminates the genus *Emydoidea* (which is monotypic if the fossil record is ignored: Holman, 2002, *op. cit.*), although it retains the monotypic genus *Clemmys*. Many proponents of the latter scheme believe that monotypic genera are not taxonomically redundant but rather reflect evolutionary distinctiveness (see Mayr and Bock, 2002, *J. Zool. Syst. Evol. Research* 40: 169–194 for a general discussion of the values of taxonomic stability and recording anagenesis in classification schemes). For the sake of current stability, and our position that monotypic genera do provide phylogenetic information, we here follow the second scheme, as recommended by Fritz et al. (2011, *op. cit.*).

***C. guttata*** (Schneider, 1792)—Spotted Turtle

Reviewed by Ernst (1972, *Cat. Am. Amph. Rept.* 124).

***Deirochelys*** Agassiz, 1857—CHICKEN TURTLES

***D. reticularia*** (Latreille, *in* Sonnini and Latreille 1801)—Chicken Turtle  
 Geographic variation in this species was reviewed by Schwartz (1956, *Fieldiana Zool.* 34 : 461–503).

- D. r. chrysea* Schwartz, 1956—Florida Chicken Turtle  
*D. r. miaria* Schwartz, 1956—Western Chicken Turtle

*D. r. reticularia* (Latreille, in Sonnini and Latreille 1801)—Eastern Chicken Turtle

***Dermochelys*** Blainville, 1816—LEATHERBACK SEA TURTLES

See note under *Caretta*.

***D. coriacea*** (Vandelli, 1761)—Leatherback Sea Turtle

***Emydoidea*** Gray, 1870—BLANDING’S TURTLES

See note under *Clemmys*.

***E. blandingii*** (Holbrook, 1838)—Blanding’s Turtle

***Eretmochelys*** Fitzinger 1843—HAWKSBILL SEA TURTLES

See note under *Caretta*.

***E. imbricata*** (Linnaeus, 1766)—Hawksbill Sea Turtle

*E. i. bispa* (Rüppell, 1835)—Pacific Hawksbill Sea Turtle

*E. i. imbricata* (Linnaeus, 1766)—Atlantic Hawksbill Sea Turtle

Although many recent authors have abandoned use of Atlantic versus Indo-Pacific Ocean subspecies (Meylan, 2006, *Chelon. Res. Monogr.* 3: 105–127), the names have not been formally synonymized. Because mitochondrial genome comparisons by Okayama et al. (1999, *Chelon. Conserv. Biol.* 3: 362–367) suggested genetic divergence between the Caribbean and Indo-Pacific populations, we retain the subspecies names pending further study.

***Glyptemys*** Agassiz 1857—SCULPTED TURTLES

See note under *Clemmys*.

***G. insculpta*** (LeConte 1830)—Wood Turtle

***G. muhlenbergii*** (Schoepff 1801)—Bog Turtle

***Gopherus*** Rafinesque, 1832—GOPHER TORTOISES

We follow Crumly (1994, *Fish Wildlife Res.* 13: 7–37) in applying the name *Gopherus* to all of the living North American testudinids (one of which is extralimital).

***G. agassizii*** (Cooper, 1861)—Mohave Desert Tortoise

See note under *G. morafkai*. The spelling of the standard English name has been changed from “Mojave” to “Mohave” for consistency with other names in the list (see note for *Crotalus scutulatus*).

***G. berlandieri*** (Agassiz, 1857)—Texas Tortoise

***G. morafkai*** Murphy, Berry, Edwards, Leviton, Lathrop, and Riedle, 2011—Sonoran Desert Tortoise

This cryptic species was formerly included in *G. agassizii* (Murphy et al., 2011, *ZooKeys* 113: 39–71). The original description noted that *G. morafkai* occurs in the Sonoran desert as well as part of the Mohave Desert and part of the Sinaloan thornscrub, and that the restricted *G. agassizii* occurs in the Mohave Desert as well as part of the Sonoran Desert. Hence, the authors recommended the patronyms Morafka’s Desert Tortoise and Agassiz’s Desert Tortoise, respectively, rather than the geographic names Sonoran Desert Tortoise (often abbreviated SDT) and Mohave Desert Tortoise (MDT), reflecting their primary distributions. However, because the latter names have long been used as standard names for these two populations (including legislation by the US Fish and Wildlife Service), and because of the potential for confusion of the abbreviation for



Morafka's Desert Tortoise (also MDT) with that for the Mohave Desert Tortoise, we support the use of the traditional geographic standard names.

***G. polyphemus*** (Daudin, 1802)—Gopher Tortoise

***Graptemys*** Agassiz, 1857—MAP TURTLES

Evidence for monophyly and content of this genus was reviewed by Dobie (1981, *Tulane Stud. Zool. Bot.* 23: 85), Lamb and Osentoski (1997, *J. Herpetol.* 31: 258–265), and Stephens and Wiens (2003, *Biol. J. Linn. Soc.* 79: 577–610).

***G. barbouri*** Carr and Marchand, 1942—Barbour's Map Turtle

***G. caglei*** Haynes and McKown, 1974—Cagle's Map Turtle

***G. ernsti*** Lovich and McCoy, 1992—Escambia Map Turtle

***G. flavimaculata*** Cagle, 1954—Yellow-blotched Map Turtle

Ennen et al. (2010, *J. Herpetol.* 44: 544–554) argued for the continued recognition of this species and the closely related *G. oculifera*, despite their limited genetic divergence.

***G. geographica*** (LeSueur, 1817)—Northern Map Turtle

We have changed the name from Common Map Turtle because of the possibility that the word 'common' might be misinterpreted to imply abundance rather than to the fact that it has a broad geographic distribution.

***G. gibbonsi*** Lovich and McCoy, 1992—Pascagoula Map Turtle

***G. nigrinoda*** Cagle, 1954—Black-knobbed Map Turtle

*G. n. delticola* Folkerts and Mount, 1969—Southern Black-knobbed Map Turtle

*G. n. nigrinoda* Cagle, 1954—Northern Black-knobbed Map Turtle

***G. oculifera*** (Baur, 1890)—Ringed Map Turtle

***G. ouachitensis*** Cagle, 1953—Southern Map Turtle

*G. o. ouachitensis* Cagle, 1953—Ouachita Map Turtle

*G. o. sabinensis* Cagle, 1953—Sabine Map Turtle

It has been suggested (Ward, 1980, Ph.D. dissertation, North Carolina State Univ.) that this subspecies should be recognized as a species. Recent molecular work (Stephens and Wiens, 2003, *Biol. J. Linn. Soc.* 79: 577–610) provided some support for that position, but further study is necessary.

***G. pearlensis*** Ennen, Lovich, Kreiser, Selman, and Qualls, 2010—Pearl River Map Turtle

This cryptic species was formerly included in *G. gibbonsi* (Ennen et al., 2010, *Chel. Conserv. Biol.* 9: 98–113).

***G. pseudogeographica*** (Gray, 1831)—False Map Turtle

*G. p. kohnii* (Baur, 1890)—Mississippi Map Turtle

*G. p. pseudogeographica* (Gray, 1831)—Northern False Map Turtle

***G. pulchra*** Baur, 1893—Alabama Map Turtle

***G. versa*** Stejneger, 1925—Texas Map Turtle

***Kinosternon*** Spix, 1824—AMERICAN MUD TURTLES

Iverson (1991, *Herpetol. Monog.* 5: 1–27) is the most recent reviewer of this genus. See also comment under *Sternotherus*.

***K. arizonense*** Gilmore, 1922—Arizona Mud Turtle

Formerly a subspecies of *K. flavescens*, Serb et al. (2001, *Mol. Phylogenet. Evol.* 18:

149–162) demonstrated that including this taxon in *K. flavescens* made the latter paraphyletic with respect to *K. baurii* and *K. subrubrum*. They recommended recognition as a species. In addition, Iverson (1989, *Southwest. Natur.* 34: 356–368) demonstrated the distinctiveness of this form, confirmed its allopatry with *K. flavescens*, and suggested that its reproductive season is asynchronous with that of *K. flavescens*.

***K. baurii*** (Garman, 1891)—Striped Mud Turtle

***K. flavescens*** (Agassiz, 1857)—Yellow Mud Turtle

The validity of the subspecies *Kinosternon flavescens spooneri* Smith, 1951 (Illinois Mud Turtle) has been questioned on morphological and molecular grounds by Houseal et al. (1982, *Copeia* 1982: 567–580), Berry and Berry (1984, *Ann. Carnegie Mus. Nat. Hist.* 53: 185–206), and Serb et al. (2001, *Mol. Phylogenet. Evol.* 18: 149–162).

***K. hirtipes*** (Wagler, 1830)—Rough-footed Mud Turtle

Collins (1997, *SSAR Herpetol. Circ.* 25) suggested the name Mexican Mud Turtle for this turtle, but that name is generally applied to *Kinosternon integrum* (Iverson et al., 1998, *Cat. Am. Amph. Rept.* 652).

*K. h. murrayi* Glass and Hartweg, 1951—Mexican Plateau Mud Turtle

***K. sonoriense*** LeConte, 1854—Sonora Mud Turtle

*K. s. longifemorale* Iverson, 1981—Sonoyta Mud Turtle

There is speculation that this taxon might deserve species status; molecular studies are currently in progress to resolve that question (P. Rosen, pers. comm.).

*K. s. sonoriense* LeConte, 1854—Desert Mud Turtle

***K. subrubrum*** (Lacépède, 1788)—Eastern Mud Turtle

*K. s. hippocrepis* Gray, 1855—Mississippi Mud Turtle

*K. s. steindachneri* (Siebenrock, 1906)—Florida Mud Turtle

*K. s. subrubrum* (Lacépède, 1788)—Southeastern Mud Turtle

### ***Lepidochelys*** Fitzinger, 1843—RIDLEY SEA TURTLES

See note under *Caretta*. Bowen et al. (1991, *Nature* 352: 709) reviewed variation within this genus.

***L. kempii*** (Garman, 1880)—Kemp's Ridley Sea Turtle

***L. olivacea*** (Eschscholtz, 1829)—Olive Ridley Sea Turtle

### ***Macrochelys*** Gray, 1855—Alligator Snapping Turtles

***M. temminckii*** (Troost in Harlan, 1835)—Alligator Snapping Turtle

Webb (1995, *Chelonian Conserv. Biol.* 1: 322–323) demonstrated that the name *Macrochelys* Gray has precedence over the name *Macroclemys* Gray (contra Smith, 1955, *Herpetologica* 11: 16). Both mtDNA and microsatellite data (Roman et al., 1999, *Conserv. Biol.* 13: 135–142; Echelle et al., 2010, *Conserv. Genetics* 11: 1375–1387) confirm that the Suwannee River basin population of Alligator Snapping Turtles is genetically distinct from other populations, and likely to be recognized taxonomically.

### ***Malaclemys*** Gray, 1844—Diamond-backed Terrapins

Dobie (1981, *Tulane Stud. Zool. Bot.* 23: 85) and Lamb and Osentoski (1997, *J. Herpetol.* 31: 258–265) reviewed evidence for monophyly and content of this genus.

***M. terrapin*** (Schoepff, 1793)—Diamond-backed Terrapin

A detailed study of the geographic variation of these turtles would prove highly informative.

- M. t. centrata* (Latreille, in Sonnini and Latreille 1801)—Carolina Diamond-backed Terrapin  
*M. t. littoralis* (Hay, 1904)—Texas Diamond-backed Terrapin  
*M. t. macropsilota* (Hay, 1904)—Ornate Diamond-backed Terrapin  
*M. t. pileata* (Wied-Neuwied, 1865)—Mississippi Diamond-backed Terrapin  
*M. t. rhizophorarum* Fowler, 1906—Mangrove Diamond-backed Terrapin  
*M. t. tequesta* Schwartz, 1955—Eastern Florida Diamond-backed Terrapin  
*M. t. terrapin* (Schoepff, 1793)—Northern Diamond-backed Terrapin

***Pseudemys* Gray, 1856—COOTERS**

Content of this genus follows Seidel and Smith (1996, *Herpetologica* 42: 242–248).

***P. alabamensis* Baur, 1893—Alabama Red-bellied Cooter**

***P. concinna* (LeConte, 1830)—River Cooter**

Only two subspecies are recognized here: *Pseudemys concinna concinna*, and *P. c. floridana*. Seidel (1994, *Chelon. Conserv. Biol.* 1: 117–130) demonstrated that *P. c. hieroglyphica* and *P. c. metterii* are not distinct and represent only clinal variation; he elevated *P. c. suwanniensis* to species status (see separate entry); and he relegated *P. floridana* to a subspecies of *P. concinna* (but see comments below). The taxonomy adopted here has recently been followed by Ernst and Lovich (2009, *Turtles of the United States and Canada*. Second Edition. John Hopkins Univ. Press, Baltimore).

*P. c. concinna* (LeConte, 1830)—Eastern River Cooter

*P. c. floridana* (LeConte, 1830)—Coastal Plain Cooter

This subspecies was formerly recognized as *Pseudemys floridana floridana*, but Seidel (1994, *Chelon. Conserv. Biol.* 1: 117–130) transferred it to *Pseudemys concinna*. Jackson (1995, *Chelon. Conserv. Biol.* 1: 329–333) objected to this based on observations that *concinna* and *floridana* are sympatric in northern Florida and South Carolina. Seidel (1995, *Chelon. Conserv. Biol.* 1: 333–336) countered that the two forms may be macrosympatric at some locations, but that they intergrade in other areas. Based on morphometric, osteological, biochemical, and pigmentation studies, Seidel (1994, *Chelon. Conserv. Biol.* 1: 117–130) found no character which reliably separates the two forms in many transition areas (intergrade zones) between the coastal plain and piedmont of the Atlantic slope. However, the two forms are microsympatric throughout the panhandle of Florida (Meylan, 2006, *Chelon. Res. Monogr.* 3: 28–36). Jackson (2006, *Chelon. Res. Monogr.* 3: 325–337), Thomas and Jansen (2006, *Chelon. Res. Monogr.* 3: 338–347), and Jensen et al. (2008, *Amphibians and Reptiles of Georgia*. Univ. Georgia Press, Athens) do not follow this taxonomy, and recognize *floridana* and *concinna* as separate species. A thorough, range-wide phylogeographic study of the ecology, morphology, and genetics (mitochondrial and nuclear DNA) is needed to settle the controversies in the taxonomy of this species complex.

***P. gorzugi* Ward, 1984—Rio Grande Cooter**

This form was originally described by Ward (1984, *Spec. Pub. Mus. Texas Tech. Univ.* 21: 1–50) as a subspecies of *P. concinna*, but it was elevated to species status by Ernst (1990, *Cat. Am. Amphib. Rept.* 461: 1–2). That change is appropriate given its clear allopatry with *Pseudemys concinna* (Ward, 1984, *Cat. Am. Amph. Rept.* 487: 1–7), its morphological distinctiveness (Seidel, 1994, *Chelon. Conserv. Biol.* 1: 117–130), and its

divergent DNA (Starkey, 1997, Ph.D. dissertation, Texas A&M Univ.; Stephens and Wiens, 2003, Biol. J. Linn. Soc. 79: 577–610).

***P. nelsoni*** Carr, 1938—Florida Red-bellied Cooter

***P. peninsularis*** Carr, 1938—Peninsula Cooter

Formerly considered a subspecies of *P. floridana* (Conant and Collins, 1992, A Field Guide to Reptiles and Amphibians: Eastern and Central North America. Houghton Mifflin Co., Boston), Seidel (1994, Chelon. Conserv. Biol. 1: 117–130) elevated this form to a species. He demonstrated that *peninsularis* does not intergrade with *P. c. floridana* in northern Florida, that it is sympatric with *P. suwanniensis*, and that there are morphometric and osteological characters (as well as markings) which consistently distinguish it from *P. concinna*. However, Thomas and Jansen (2006, Chelon. Res. Monogr. 3: 338–347) recommended the recognition of this form as a subspecies of *P. floridana*.

***P. rubriventris*** (LeConte, 1830)—Northern Red-bellied Cooter

***P. suwanniensis*** Carr, 1937—Suwannee Cooter

Seidel (1994, Chelon. Conserv. Biol. 1: 117–130) elevated this form from a subspecies of *P. concinna* to a species based on his belief that it is allopatric or parapatric with other members of the *concinna* group. However, Jackson (1995, Chelon. Conserv. Biol. 1: 329–333) believed that it may intergrade with *P. c. concinna* in northern Florida and thus does not deserve species status. Recent availability of material from the Gulf Hammock region of northwest Florida is reviewed by Jackson (2006, Chelon. Res. Monogr. 3: 325–337), who recommended recognition of this form as a subspecies of *P. concinna*.

***P. texana*** Baur, 1893—Texas Cooter

### ***Sternotherus*** Gray, 1825—MUSK TURTLES

The monophyly of the genus *Sternotherus* was questioned by Seidel et al. (1986, Copeia 1986: 285–294) and Iverson (1991, Herpetol. Monogr. 5: 1–27); however, Iverson (1998, Chelon. Conserv. Biol. 3: 113–117) provided support for its monophyly.

***S. carinatus*** (Gray, 1855)—Razor-backed Musk Turtle

***S. depressus*** Tinkle and Webb, 1955—Flattened Musk Turtle

***S. minor*** (Agassiz, 1857)—Loggerhead Musk Turtle

*S. m. minor* (Agassiz, 1857)—Eastern Loggerhead Musk Turtle

*S. m. peltifer* Smith and Glass, 1947—Stripe-necked Musk Turtle

***S. odoratus*** (Latreille, *in* Sonnini and Latreille, 1801)—Eastern Musk Turtle

We have changed the name from Common Musk Turtle because of the possibility that the word ‘common’ might be misinterpreted to imply abundance rather than to the fact that it has a broad range.

### ***Terrapene*** Merrem, 1820—AMERICAN BOX TURTLES

A review of the variation in this genus appeared in Dodd (2001, North American Box Turtles, Univ. Oklahoma Press, Norman). Based on molecular and morphological evidence, Butler et al. (2011, Biol. J. Linn. Soc. 102: 889–901) concluded that the Florida Box Turtle (formerly *T. carolina bauri*) should be elevated to full species status, and that the Gulf Coast Box Turtle (formerly *T. c. major*) represents an intergrade population between the Eastern Box Turtle *T. c. carolina* and the Pleistocene Box Turtle (formerly *T. c. putnami*). They recommend that the name *T. c. major* only be applied to the Pleistocene form, and that additional study of the Gulf Coast populations is warranted.

***T. baurii*** Taylor, 1894)—Florida Box Turtle

***T. carolina*** (Linnaeus, 1758)—Eastern Box Turtle

*T. c. carolina* (Linnaeus, 1758)—Woodland Box Turtle

*T. c. triunguis* (Agassiz, 1857)—Three-toed Box Turtle

***T. ornata*** (Agassiz, 1857)—Ornate Box Turtle

*T. o. luteola* Smith and Ramsey, 1952)—Desert Box Turtle

*T. o. ornata* (Agassiz, 1857)—Plains Box Turtle

***Trachemys*** Agassiz, 1857—SLIDERS

Content of this genus follows Seidel and Smith (1996, *Herpetologica* 42: 242–248) and Seidel (2002, *J. Herpetol.* 36: 285–292).

***T. gaigeae*** (Hartweg, 1939)—Mexican Plateau Slider

Price and Hillis (1989, *First World Congr. Herpetol. Abstract*), Seidel et al. (1999, *Herpetologica* 55: 470–487), and Seidel (2002, *J. Herpetol.* 36: 285–292) provided evidence for the specific recognition of this form. Reviewed by Stuart and Ernst (2004, *Cat. Amer. Amphib. Rept.* 787).

*T. g. gaigeae* (Hartweg, 1939)—Big Bend Slider

***T. scripta*** (Schoepff, 1792)—Pond Slider

*T. s. elegans* (Wied-Neuwied, 1838)—Red-eared Slider

*T. s. scripta* (Schoepff, 1792)—Yellow-bellied Slider

*T. s. troostii* (Holbrook, 1836)—Cumberland Slider

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*Alien Species*

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Alien species are those species established outside their native ranges by the activities of humans, whether done intentionally or not. Prior versions of this check-list referred to these species as “introduced”. I have changed that usage here because an introduction need not imply successful establishment; many additional species have been introduced to the United States that have not become established and are not included here. Species covered in this treatment are those known to be extra-territorial to the United States (e.g., Green Iguana, *Iguana iguana*) and those whose native status within the United States may be open to question (e.g., Bark Anole, *Anolis distichus* in South Florida).

Inclusion in this list is based on evidence or claims of establishment within the United States that have been presented in the literature and which seem to meet the criteria given by Meshaka et al. (2004, *The Exotic Amphibians and Reptiles of Florida*. Krieger Publishing Co., Malabar, Florida). But scientific standards for reporting newly established alien species are minimal, evidence adduced in favor of these claims varies, correction of published errors is often delayed, and, consequently, some published claims may not be factually accurate. Because of these problems, I note instances known to me for which published claims suggesting establishment are nonetheless disputed or uncertain. Some of the countervailing evidence calling these reports into question is not yet presented in the literature but mention of such instances is included here to highlight where doubt is reasonable. The presence of these several cases argues for the need to have tighter editorial accountability when publishing such claims.

Excluded from this list are those species native within the boundaries of the United States that have been translocated by humans elsewhere in the country. Many such instances are known and include, for example, the Cane Toad (*Rhinella marina*) and Bullfrog (*Lithobates catesbeianus*). Also excluded are those alien species introduced to the United States but never established (innumerable examples) and those populations previously established but now extinct, such as an earlier Italian Wall lizard (*Podarcis sicula*) colony that persisted for decades in Pennsylvania (Kauffeld, 1931, *Copeia* 1931: 163–164; Conant, 1959, *Copeia* 1959: 335–336). Finally, the literature includes mention of additional species that may be established in the United States but for which evidence of self-sustaining populations is less compelling or is not discussed in the original publications. Many of these reports are mentioned in Meshaka et al. (2004, *The Exotic Amphibians and Reptiles of Florida*, Krieger Publishing Co., Malabar, Florida).

A literature search through July 2011 was used to provide a list of states for which alien species are known to occur. Supporting literature for most of these introductions is available in Kraus (2009, Alien reptiles and amphibians: a scientific compendium and analysis. Springer Science and Business Media B.V., Dordrecht, Netherlands). Sixty-nine to seventy-two alien species of amphibians and reptiles are reported to be established in the United States. Taxonomically, most of these are lizards (n = 60–61), followed by anurans (n = 6), snakes (n = 5), turtles (n = 2), and crocodylians (n = 1). Forty-four of these species are from the Old World and thirty-one from the New World.

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*Alien Species — ANURANS*

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***Dendrobates*** Wagler, 1830—POISON DART FROGS

The most recent review of this genus and its relatives is Grant et al. (2006, Bull. Amer. Mus. Nat. Hist. 299: 1–262).

***D. auratus*** Girard, 1855—Green-and-black Poison Dart Frog

The Green-and-black Poison Dart Frog is native to Central America and Colombia and is established in Hawaii.

***Eleutherodactylus*** Duméril and Bibron, 1841—RAIN FROGS

***E. coqui*** Thomas, 1966—Coquí

The Coquí is native to Puerto Rico, has been reported from four states, and is reported as established in California, Florida and Hawaii. It is widely established on Hawaii Island but is more restricted and the target of eradication efforts on the other Hawaiian Islands. Populations in California and Florida appear to be limited to nurseries (Dalrymple, 1994, Non-indigenous Amphibians and Reptiles in Florida in Schmitz, D.C. and T.C. Brown [eds.], An Assessment of Invasive Non-indigenous Species in Florida's Public Lands, Technical Rpt. TSS-94-100. Florida Department of Env. Protection, Tallahassee, FL., Pp. 67–78; K. Krysko, pers. comm.; D. Schnabel, pers. comm.), it is uncertain to what extent they are maintained by constant re-introduction, and they perhaps should not truly be considered established.

***E. planirostris*** (Cope, 1862)—Greenhouse Frog

The Greenhouse Frog is native to Cuba, the Bahamas, and Cayman Islands and is established in Alabama, Florida, Georgia, Hawaii, Louisiana, and Mississippi.

***Glandirana*** Fei, Ye, and Huang, 1991—WRINKLED FROGS

This genus of Asian frogs was recently removed from a polyphyletic “*Rana*” by Frost et al. (2006, Bull. Am. Mus. Nat. Hist., 297).

***G. rugosa*** (Temminck and Schlegel, 1838)—Japanese Wrinkled Frog

The Japanese Wrinkled Frog is native to Japan and is established in Hawaii.

***Osteopilus*** Fitzinger, 1843—WEST INDIAN TREEFROGS

***O. septentrionalis*** (Duméril and Bibron, 1841)—Cuban Treefrog

The Cuban Treefrog is native to Cuba, the Bahamas, and Cayman Islands, has been

introduced into six states, and is established in Florida. It has been claimed to be established in Hawaii (McKeown, 1996, A Field Guide to Reptiles and Amphibians in the Hawaiian Islands, Diamond Head Publishing, Inc., Los Osos, California) but there is no supporting evidence.

***Xenopus* Wagler, 1827—CLAWED FROGS**

***X. laevis* (Daudin, 1802)—African Clawed Frog**

The African Clawed Frog is native to southern Africa, has been reported from nine states, and is established in Arizona and California.

Alien Species — LIZARDS

***Agama* Daudin, 1802—AGAMAS**

***A. agama* (Linnaeus, 1758)—African Rainbow Lizard**

*A. a. africana* Hallowell, 1844—West African Rainbow Lizard

The African Rainbow Lizard is native to Africa and is established in Florida. Subspecific identification was provided for five populations by Enge et al. (2004, Florida Scientist 67: 303–310).

***Ameiva* Meyer, 1795—AMEIVAS**

***A. ameiva* (Linnaeus, 1758)—Giant Ameiva**

The Giant Ameiva is native to South America and is established in Florida. Both *Ameiva ameiva ameiva* and *A. a. petersi* have been claimed to be released in Florida (King and Krakauer, 1966, Quart. J. Fla. Acad. Sci. 29: 144–154). The taxonomic status of these populations vis á vis the next species has recently been clarified (Ugueto and Harvey., 2011, Herpetol. Monogr. 25: 113–170).

***A. praesignis* (Baird and Girard, 1852)—Borriguerro Ameiva**

The Borriguerro Ameiva is native to northern South America and southern Central America. It has been established in Florida since at least the early 1980s, but its taxonomic identity has only recently been clarified (Ugueto and Harvey., 2011, Herpetol. Monogr. 25: 113–170).

***Anolis* Daudin, 1802—ANOLES**

Taxonomy for *Anolis* follows Williams (1976, Breviora 440: 1–21) with addition of subspecies from Schwartz and Henderson (1991, Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History, University of Florida Press) and modifications by Vance (1991, Bull. Maryland Herpetol. Soc. 27: 43–89; description of *A. carolinensis seminolus*). Some authors (e.g., Guyer and Savage, 1986, Syst. Zool. 35: 509–531; 1992, Syst. Biol. 41: 89–110; Savage and Guyer, 1989, Amphibia-Reptilia 10: 105–116) divide *Anolis* into the following five genera (assignments of species covered in this checklist in parentheses): *Anolis* (*carolinensis*, *chlorocyanus*, *equestris*), *Ctenonotus* (*crystallocellus*, *cybotes*, *distichus*), *Dactyloa*, *Norops* (*garmani*, *sagrei*), and *Xiphosurus* = *Semiurus*.

***A. chlorocyanus* Duméril and Bibron, 1837—Hispaniolan Green Anole**

The Hispaniolan Green Anole is native to Hispaniola and is established in Florida.

***A. (Ctenonotus) cristatellus* Duméril and Bibron, 1837—Crested Anole**

*A. c. cristatellus* Duméril and Bibron, 1837—Puerto Rican Crested Anole



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The Puerto Rican Crested Anole is native to Puerto Rico and the Virgin Islands and is established in Florida. Subspecific identifications have been given for the Dade County specimens by Schwartz and Henderson (1988, *Contrib. Biol. Geol. Milwaukee Publ. Mus.* 74: 1–264; 1991, *Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History*, University of Florida Press).

### *A. cybotes* Cope, 1862—Large-headed Anole

The Large-headed Anole is native to Hispaniola and the Bahamas and is established in Florida.

### *A. c. cybotes* Cope, 1862—Common Large-headed Anole

The Dade County population has been identified as *A. c. cybotes* (Schwartz and Henderson, 1988, *Contrib. Biol. Geol. Milwaukee Pub. Mus.* 74: 1–264). No subspecific identification for the Broward County population has been provided.

### *A. (Ctenonotus) distichus* Cope, 1861—Bark Anole

The Bark Anole is native to Hispaniola, has been reported from two states, and is established in Florida.

### *A. d. dominicensis* Reinhardt and Lütken, 1863—Green Bark Anole

*Anolis distichus dominicensis* is established in Miami, Florida (King and Krakauer, 1966, *Quart. J. Florida Acad. Sci.* 29: 144–154; Wilson and Porras, 1983, *Univ. Kansas Mus. Nat. Hist. Spec. Publ.* 9: 1–89). Another subspecies, *Anolis distichus ignigularis*, was introduced to Dade County, Florida (King and Krakauer, 1966, *Quart. J. Florida Acad. Sci.* 29: 144–154) and was listed as occurring there by Schwartz and Henderson (1988, *Contrib. Biol. Geol. Milwaukee Pub. Mus.* 74: 1–264; 1991, *Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History*, University of Florida Press); however, according to Wilson and Porras (1983, *Univ. Kansas Mus. Nat. Hist. Spec. Publ.* 9: 1–89), this population is no longer extant. Hybridization appears to have occurred between *A. d. dominicensis* and *A. d. floridanus* (Miyamoto et al., 1986, *Copeia* 1986: 76–86; see next note).

### *A. d. floridanus* Smith and McCauley, 1948—Florida Bark Anole

Schwartz (1968, *Bull. Mus. Comp. Zool.* 137: 255–310) reviewed the evidence and discussed alternative hypotheses concerning the occurrence of *Anolis distichus floridanus* in Florida and concluded that this taxon was most likely introduced from Andros Island in the Bahamas; nevertheless, Wilson and Porras (1983, *Univ. Kansas Mus. Nat. Hist. Spec. Publ.* 9: 1–89) considered it a native component of the Florida herpetofauna. Although the specimens of *A. d. floridanus* examined by Schwartz (1968, *Bull. Mus. Comp. Zool.* 137: 255–310) are distinguishable from those of *A. d. dominicensis*, more recent samples of Bark Anoles from Florida form a continuum, suggesting intergradation between the two subspecies (Miyamoto et al., 1986, *Copeia* 1986: 76–86).

### *A. equestris* Merrem, 1820—Knight Anole

The Knight Anole is native to Cuba and is established in Florida and Hawaii.

### *A. e. equestris* Merrem, 1820—Western Knight Anole

The subspecific identification for the Florida population was given by Schwartz and Henderson (1988, *Contrib. Biol. Geol. Milwaukee Pub. Mus.* 74: 1–264; 1991, *Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History*, University of Florida Press); that for the Hawaiian population was given by Lazell and McKeown (1998, *Bull. Chicago Herpetol. Soc.* 33: 181).

### *A. (Ctenonotus) ferreus* Cope, 1864—Comb Anole

The Comb Anole is native to Marie-Galante. Bartlett (1994, *Reptile and Amphibian Magazine* Mar/Apr.: 56–73, 103–109) and Bartlett and Bartlett (1999, *A Field Guide to Florida Reptiles and Amphibians*, Gulf Publishing Co., Houston, Texas) presented

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evidence of reproduction over several years in Florida in the early 1990s but population persistence has been disputed by Meshaka et al. (2004, *The Exotic Amphibians and Reptiles of Florida*. Krieger Publishing Co., Malabar, Florida), K. Enge (pers. comm.), and K. Krysko (pers. comm.), and voucher specimens are lacking.

### ***A. (Norops) garmani*** Stejneger, 1899—Jamaican Giant Anole

The Jamaican Giant Anole is native to Jamaica and is established in Florida.

### ***A. porcatus*** Gray, 1840—Cuban Green Anole

The Cuban Green Anole is native to Cuba and is established in Florida.

### ***A. (Norops) sagrei*** Duméril and Bibron, 1837—Brown Anole

The Brown Anole is native to Cuba and the Bahamas, has been reported from 13 states, and is established in Alabama, Florida, Georgia, Hawaii, Louisiana, North Carolina, South Carolina, and Texas.

### ***A. s. sagrei*** Duméril and Bibron, 1837—Cuban Brown Anole

According to Conant and Collins (1991, *Reptiles and Amphibians of Eastern and Central North America*, Houghton Mifflin Co.), two subspecies, *A. s. sagrei* and *A. s. ordinatus* were introduced to southern Florida, but they can no longer be distinguished from one another and differ from both original races. Lee (1992, *Copeia* 1992: 942–954) presented evidence that the Florida populations bear a much stronger phenotypic resemblance to populations from Cuba (*A. s. sagrei*) than to those from the Bahamas (*A. s. ordinatus*). Kolbe et al. (2004, *Nature* 431: 177–181) present evidence for multiple introductions of this species from Cuba to Florida, which suggests that *A. s. greyi* may also have been involved.

### ***A. trinitatis*** Reinhardt and Lütken 1862—St. Vincent Bush Anole

The St. Vincent Bush Anole is native to St. Vincent, Lesser Antilles, and is established in Florida.

## ***Aspidoscelis*** Fitzinger, 1843—WHIPTAILS

### ***A. motaguae*** Sackett, 1941—Giant Whiptail

The Giant Whiptail is native to Central America and is established in Florida.

## ***Basiliscus*** Laurenti, 1768—BASILISKS

### ***B. vittatus*** Wiegmann, 1828—Brown Basilisk

The Brown Basilisk is native to Central and northern South America and is established in Florida.

## ***Calotes*** Cuvier, 1817—BLOODSUCKERS

The English name is derived from the brilliant orange or crimson colors that breeding males develop around the head and shoulders.

### ***C. mystaceus*** Duméril and Bibron, 1837—Indochinese Bloodsucker

The Indochinese Bloodsucker is native to Southeast Asia and is reported as established in two Florida counties by several authors (Butterfield et al., 1997, *Nonindigenous amphibians and reptiles*, Pp. 123–138 in Simberloff, D., D.C. Schmitz, and T.C. Brown [eds.], *Strangers in Paradise: Impact and Management of Nonindigenous Species in Florida*. Island Press, Washington, DC; Bartlett and Bartlett, 1999, *A Field Guide to Florida Reptiles and Amphibians*, Gulf Publishing Co., Houston, Texas; Meshaka et al., 2004, *The Exotic Amphibians and Reptiles of Florida*, Krieger Publishing Co., Malabar, Florida). But K. Krysko (pers. comm.) cautions that voucher specimens or photos of wild animals are entirely lacking, so these reports require scientific confirmation.

***C. “versicolor”*** (Daudin 1802)—Variable Bloodsucker

The Variable Bloodsucker is native to southern and southeastern Asia and is established in Florida. The specific epithet is in quotation marks because Zug et al. (2006, Proc. Cal. Acad. Sci. 57: 35–68) demonstrated that *C. “versicolor”* is a complex of several species. The introduced population has yet to be identified in light of this new information.

***Chalcides*** Laurenti, 1768—Skinks***C. ocellatus*** (Forskål 1775)—Ocellated Skink

The Ocellated Skink is native to the Mediterranean region, Middle East, and northern Africa and is established in Florida.

***Chamaeleo*** Laurenti, 1768—CHAMELEONS***C. calyptratus*** Duméril and Bibron, 1851—Veiled Chameleon

The Veiled Chameleon is native to the southwestern Arabian Peninsula and is established in Florida and Hawaii.

***C. jacksonii*** Boulenger, 1896—Jackson’s Chameleon

Jackson’s Chameleon is native to eastern Africa and is established in California and Hawaii.

***Chondrodactylus*** Peters, 1870—SAND GECKOS

Bauer and Lamb (2005, African J. Herpetol. 54: 105–129) revised *Pachydactylus* and placed the *bibronii* group in *Chondrodactylus*.

***C. bibronii*** (Smith, 1846)—Bibron’s Sand Gecko

Bibron’s Sand Gecko is native to southern Africa and is claimed to be established in Florida (Bartlett and Bartlett, 1999, A Field Guide to Florida Reptiles and Amphibians, Gulf Publishing Co., Houston, Texas; Meshaka et al., 2004, The Exotic Amphibians and Reptiles of Florida, Krieger Publishing Co., Malabar, Florida), but the claim is disputed by others (K. Krysko, pers. comm.).

***“Cnemidophorus”*** Wagler, 1830—SOUTH AMERICAN WHIPTAILS

Taxonomy for “*Cnemidophorus*” follows Peters and Donoso-Barros (1970, Bull. United States Natl. Mus. 297(Part II): 1–293). Reeder et al. (2002, Am. Mus. Novit. 3365: 1–61) presented evidence that *Cnemidophorus*, even after the removal of *Aspidoscelis*, is not monophyletic, although they did not propose a taxonomic change to rectify this situation. I have placed the name “*Cnemidophorus*” in quotation marks to indicate the apparently non-monophyletic status of the taxon.

***“C.” lemniscatus*** (Linnaeus, 1758)—Rainbow Whiptail

The Rainbow Whiptail is native to South America and is established in Florida. Several species, both uni- and bisexual, have been described for different parts of the taxon that was formerly known as “*C.” lemniscatus* (Cole and Dessauer, 1993, Am. Mus. Novit. 3081: 1–30; Markezich et al., 1997, Am. Mus. Novit. 3207: 1–60), and the introduced population has not yet been associated with one or more of those species.

***Cryptoblepharus*** Wiegmann, 1834—SNAKE-EYED SKINKS***C. poecilopleurus*** (Wiegmann, 1834)—Pacific Snake-eyed Skink

The Pacific Snake-eyed Skink is native to many Pacific islands and is established in Hawaii.

***Ctenosaura*** Wiegmann, 1828—SPINY-TAILED IGUANAS***C. conspicuosa*** Dickerson, 1919—Isla San Esteban Spiny-tailed Iguana

A population of *Ctenosaura* established at the Arizona-Sonora Desert Museum in Arizona contains mitochondrial DNA from the Isla San Esteban Spiny-tailed Iguana, but it remains uncertain whether this represents a pure population of this species or a hybrid swarm with the next (Edwards et al., 2005, *Sonoran Herpetologist* 18: 122–125). Both are often considered subspecies of *C. hemilopha*.

***C. macrolopha*** Smith, 1972—Sonoran Spiny-tailed Iguana

A population of *Ctenosaura* established at the Arizona-Sonora Desert Museum in Arizona contains mitochondrial DNA from the Sonoran Spiny-tailed Iguana, but it remains uncertain whether this represents a pure population of this species or a hybrid swarm with the preceding (Edwards et al., 2005, *Sonoran Herpetologist* 18: 122–125). Both are often considered subspecies of *C. hemilopha*.

***C. pectinata*** (Wiegmann, 1834)—Mexican Spiny-tailed Iguana

The Mexican Spiny-tailed Iguana is native to Central America and is established in Florida and Texas.

***C. similis*** (Gray, 1831)—Gray's Spiny-tailed Iguana

Gray's Spiny-tailed Iguana is native to Central America and is established in Florida.

***Cyrtopodion*** Fitzinger, 1843—BOW-FINGERED GECKOS***C. scabrum*** (Heyden, 1827)—Rough-tailed Gecko

The Rough-tailed Gecko is native to the Middle East and northeastern Africa and is established in Texas.

***Emoia*** Gray, 1845—EMOIAS

Taxonomy for *Emoia cyanura* and *E. impar* follows Ineich and Zug (1991, *Copeia* 1991: 1132–1136).

***E. cyanura*** (Lesson, 1830)—Copper-tailed Skink

The Copper-tailed Skink is native to the Pacific islands and is established in Hawaii.

***E. impar*** (Werner, 1898)—Azure-tailed Skink

The Azure-tailed Skink is native to the Pacific islands and is established in Hawaii.

***Furcifer*** Fitzinger, 1843—CHAMELEONS***F. oustaleti*** (Mocquard, 1894)—Oustalet's Chameleon

Oustalet's Chameleon is native to Madagascar and is established in Florida.

***Gehyra*** Gray, 1834—DTELLAS***G. mutilata*** (Wiegmann, 1834)—Mutilating Gecko

The Mutilating Gecko is native from South Asia through the Pacific islands, has been reported from three states, and is established in Hawaii. The date of publication of the name *Hemidactylus mutilatus* (= *Gehyra mutilata*) is sometimes given as 1835 (e.g., Kluge, 1991, *Smithsonian Herpetol. Info. Serv.* 85: 1–35) presumably based on the idea that the species was first described in a publication by Wiegmann in *Nova Acta Acad. Caes. Leop. Carol. Nat. Cur.* the date of which is either 1834 or 1835; however the first valid use of the name is in Wiegmann (1834, *Herpetologica Mexicana*; see Bauer and Adler, 2001, *Arch. Nat. Hist.*, 28: 313–326 for a discussion of the dates of the relevant publications).

**Gekko** Laurenti, 1768—TYPICAL GECKOS**G. badenii** Szczerbak and Nekrasova 1994—Golden Gecko

The Golden Gecko is native to Vietnam and is recently established in Florida.

**G. gecko** (Linnaeus, 1758)—Tokay Gecko

The Tokay Gecko is native to Southeast Asia and has been introduced to Florida and Hawaii. It is established in Florida but the single known incipient population in Hawaii is apparently now eradicated.

**Gonatodes** Fitzinger, 1843—AMERICAN BENT-TOED GECKOS**G. albogularis** (Duméril and Bibron, 1836)—Yellow-headed Gecko

The Yellow-headed Gecko is native to Central and South America and the Caribbean and is established in Florida.

**Hemidactylus** Gray, 1825—HOUSE GECKOS**H. frenatus** Duméril and Bibron, 1836—Common House Gecko

The Common House Gecko is native to South and Southeast Asia and is established in Florida, Hawaii, and Texas.

**H. garnotii** Duméril and Bibron, 1836—Indo-Pacific House Gecko (unisexual)

The Indo-Pacific Gecko is native to South and Southeast Asia, has been reported from five states, and is established in Florida, Georgia, Hawaii, and Texas.

**H. mabouia** (Moreau de Jonnés, 1818)—Wood Slave

The Wood Slave is native to Africa (and perhaps parts of South America and the Caribbean, cf. Kluge, 1969, Misc. Publ. Univ. Michigan Mus. Zool. 138: 1–78) and is established in Florida.

**H. platyurus** (Schneider, 1792)—Asian Flat-tailed House Gecko

The Asian Flat-tailed House Gecko is native to Southeast Asia and is established in Florida. This species was recently removed from *Cosymbotus* by Carranza and Arnold (2006, Mol. Phylogenet. Evol. 38: 531–545).

**H. turcicus** (Linnaeus, 1758)—Mediterranean Gecko

The Mediterranean Gecko is native to the Mediterranean region, has been reported from 22 states, and is established in Alabama, Arizona, Arkansas, California, Florida, Georgia, Illinois, Kansas, Louisiana, Maryland, Mississippi, Missouri, Nevada, New Mexico, North Carolina, Oklahoma, South Carolina, Texas, Utah, and Virginia.

**Hemiphyllodactylus** Bleeker, 1860—TREE GECKOS**H. typus** Bleeker, 1860—Indo-Pacific Tree Gecko (unisexual)

The Indo-Pacific Tree Gecko is native to Southeast Asia and the Pacific, has been reported from two states, and is established in Hawaii.

**Iguana** Laurenti, 1768—IGUANAS**I. iguana** (Linnaeus, 1758)—Green Iguana

The Green Iguana is native to Central and South America, has been reported from six states, and is established in Florida and Hawaii.

**Lacerta** Linnaeus, 1758—LACERTAS**L. bilineata** Daudin 1802—Western Green Lacerta

The Western Green Lacerta is native to Western Europe, has been reported from two states, and is established in Kansas.

***Lampropholis*** Fitzinger, 1843—SUNSKINKS

***L. delicata*** (De Vis, 1888)—Plague Skink

The Plague Skink is native to eastern Australia and is established in Hawaii.

***Leiocephalus*** Gray, 1827—CURLY-TAILED LIZARDS

***L. carinatus*** Gray, 1827—Northern Curly-tailed Lizard

The Northern Curly-tailed Lizard is native to Cuba, Bahamas, and the Cayman Islands and is established in Florida.

***L. schreibersii*** (Gravenhorst, 1837)—Red-sided Curly-tailed Lizard

The Red-sided Curly-tailed Lizard is native to Hispaniola and is established in Florida.

***Leiolepis*** Cuvier, 1829—BUTTERFLY LIZARDS

***L. belliana*** (Gray, 1827)—Butterfly Lizard

The Butterfly Lizard is native to Southeast Asia and is established in Florida.

***Lepidodactylus*** Fitzinger, 1843—INDO-PACIFIC GECKOS

***L. lugubris*** (Duméril and Bibron, 1836)—Mourning Gecko (unisexual)

The Mourning Gecko is native from South Asia through much of the Pacific, has been reported from four states, and is established in Florida and Hawaii. This taxon is a unisexual complex of diploid and triploid populations of apparently independent origins (Moritz et al., 1993, Biol. J. Linn. Soc. 48: 113–133; Volobouev, 1994, Biogeographica 70: 14).

***Lipinia*** Gray, 1845—LIPINIAS

***L. noctua*** (Lesson, 1830)—Moth Skink

The Moth Skink is native to some of the Pacific Islands and is established in Hawaii.

***Mabuya*** Fitzinger, 1826—MABUYAS

***M. multifasciata*** (Kuhl, 1820)—Brown Mabuya

The Brown Mabuya is native to South and Southeast Asia and is established in Florida.

***Phelsuma*** Gray, 1825—DAY GECKOS

***P. grandis*** Gray, 1870—Madagascan Day Gecko

The Madagascar Day Gecko is native to Madagascar and is established in Florida and Hawaii. Formerly referred to *P. madagascariensis* Gray, 1831 prior to recent partitioning of that species (Raxworthy et al., 2007, Syst. Biol. 56: 907–923).

***P. guimbeaui*** Mertens, 1963—Orange-spotted Day Gecko

The Orange-spotted Day Gecko is native to Mauritius and is established in Hawaii.

***P. laticauda*** (Boettger, 1880)—Gold Dust Day Gecko

The Gold Dust Day Gecko is native to Madagascar and the Seychelles, is established in Hawaii, and may be established in Florida.

***Podarcis*** Wagler, 1830—WALL LIZARDS

***P. muralis*** (Laurenti, 1768)—Common Wall Lizard

The Common Wall Lizard is native to Europe, has been reported from four states, and is established in Indiana, Kentucky, Ohio, and British Columbia.

***P. sicula*** (Rafinesque, 1810)—Italian Wall Lizard

The Italian Wall Lizard is native to Europe, has been reported from five states, and is established in California, Kansas, New Jersey, and New York. It was formerly established in Pennsylvania but is now extirpated there.

***Sphaerodactylus*** Wagler, 1830—DWARF GECKOS

***S. argus*** Gosse, 1850—Ocellated Gecko

The Ocellated Gecko is native to Cuba, Jamaica, and the Bahamas and is established in Florida.

***S. elegans*** MacLeay, 1834—Ashy Gecko

The Ashy Gecko is native to Cuba and Hispaniola and is established in Florida.

***Tarentola*** Gray, 1825—WALL GECKOS

***T. annularis*** (Geoffroy Saint-Hilaire, 1827)—Ringed Wall Gecko

The Ringed Wall Gecko is native to northern Africa and is established in Florida.

***T. mauritanica*** (Linnaeus, 1758)—Moorish Gecko

The Moorish Gecko is native to the Mediterranean region, has been reported from four states, is established in Florida, and is claimed to be established in California (Mahrtdt, 1998, Herpetol. Rev. 29: 52).

***Trachylepis*** Fitzinger, 1843—SKINKS

***T. quinquetaeniata*** (Lichtenstein, 1823)—African Five-lined Skink

The African Five-lined Skink is native to a wide band of sub-Saharan Africa and is established in Florida.

***Tupinambis*** Daudin, 1803—TEGUS

***T. merianae*** Duméril and Bibron 1839—Argentine Giant Tegu

The Argentine Giant Tegu is native to South America and is established in Florida.

***Varanus*** Merrem, 1820—MONITOR LIZARDS

***V. niloticus*** (Linnaeus in Hasselquist, 1762)—Nile Monitor

The Nile Monitor is native to Africa, has been reported from two states, and is established in Florida.

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***Alien Species — SNAKES***

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***Acrochordus*** Hornstedt, 1787—FILE SNAKES

***A. javanicus*** Hornstedt, 1787—Javanese File Snake

The Javanese File Snake is native to Southeast Asia and is established in Florida.

***Boa*** Linnaeus, 1758—BOAS

***B. constrictor*** Linnaeus, 1758—Boa Constrictor

The Boa Constrictor is native to Central and South America, has been reported from 11 states, and is established in Florida.

***Python*** Daudin, 1803—PYTHONS***P. molurus*** (Linnaeus, 1758)—Indian Python*P. m. bivittatus* Kuhl, 1820—Burmese Python

The Burmese Python is native to South and Southeast Asia, has been reported from six states, and is established in Florida.

***P. sebae*** (Gmelin, 1788)—Northern African Rock Python

The Northern African Rock Python is native to sub-Saharan Africa and is established in Florida.

***Ramphotyphlops*** Fitzinger, 1843—AUSTRALASIAN BLINDSNAKES***R. braminus*** (Daudin, 1803)—Brahminy Blindsnake (Unisexual)

The Brahminy Blindsnake is likely native to South Asia, has been reported from ten states, and is established in Alabama, California, Florida, Georgia, Hawaii, Louisiana, Massachusetts, Texas, and Virginia.

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***Alien Species — CROCODILIANS***


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***Caiman*** Spix, 1825—CAIMANS***C. crocodilus*** (Linnaeus, 1758)—Spectacled Caiman

The Spectacled Caiman is native to South America, has been reported from seven states, and is established in Florida.

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***Alien Species — TURTLES***


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***Palea*** Meylan, 1987—WATTLE-NECKED SOFTSHELLS***P. steindachneri*** (Siebenrock, 1906)—Wattle-necked Softshell

The Wattle-necked Softshell is native to southeastern China and northern Vietnam, has been reported from two states, and is established in Hawaii.

***Pelodiscus*** Gray, 1844—CHINESE SOFTSHELLS***P. sinensis*** (Weigmann, 1835)—Chinese Softshell

The Chinese Softshell is native to eastern Asia, has been reported from three states, and is established in Hawaii.





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