Cane Toad (*Rhinella marina*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, April 2011
Revised, July 2015 and October 2016
Web Version, 4/5/2018

Photo: U.S. Geological Survey.

1 Native Range and Status in the United States

Native Range

From Somma (2015):

"Cane Toads are indigenous to northern South America (Argentina, Bolivia, Brazil, Ecuador, Colombia, Paraguay, Venezuela, the Guianas, mainland Honduras, Peru, Trinidad and Tobago), Central America, and Mexico northward to extreme southern Texas (Cameron, Hidalgo, Jim Hogg, Starr, Webb, and Zapata Counties) (Blair, 1947; Axtell and Wasserman, 1953; Neill, 1965; Smith and Smith, 1973, 1976, 1993; Zug and Zug, 1979; Frost, 1985; Easteal, 1986; Garrett and Barker, 1987; Flores-Villela, 1993; Lee, 1996; Meyer and Foster, 1996; Murphy, 1997; Renjifo, [1997]; Campbell, 1998, 1999; Conant and Collins, 1998; Bartlett and Bartlett, 1999a; Duellman, 1999a, 2005; Duellman and Sweet, 1999; Auth et al., 2000; Dixon, 2000; Lever, 2001; McCranie and Wilson, 2002; Savage, 2002; McCranie et al., 2006)."

Status in the United States

From Somma (2015):

"Cane Toads are indigenous […] northward to extreme southern Texas (Cameron, Hidalgo, Jim Hogg, Starr, Webb, and Zapata Counties) […]"

"The only Cane Toad found in Massachusetts was collected; it is not established in this state (Cardoza et al., 1993)."

"In Florida, *R. marina* is apparently established in Bay, Broward, Miami-Dade, Citrus, Glades, Highlands, Hillsborough, Lee, Martin, Monroe (including Stock Island and Key West), Okeechobee, Orange, Palm Beach, Pasco, Pinellas, and Polk Counties (Duellman and Schwartz, 1958; Fitcher, 1970; Stevenson, 1976; Wilson and Porras, 1983; Ashton and Ashton, 1988; Moler, 1988; Lazell, 1989; Carmichael and Williams, 1991; Stevenson and Crowe, 1992; Bartlett, 1994, 2002; Dalrymple, 1994; Beltz, 1995; McCoid and Kleberg, 1995; McCann et al., 1996; Butterfield et al., 1997; Meshaka, 1997, 1999a, b; Conant and Collins, 1998; Bartlett and Bartlett, 1999b; Duellman and Sweet, 1999; Meshaka et al., 2000, 2004; Lever, 2001; Ferriter et al., 2006; King, 2006; Himes, 2007). Cane Toads introduced to Hendry and Sarasota Counties failed, along with the original, but not subsequent, introductions to Palm Beach and Miami-Dade (prior to 1958) Counties (Lever, 2001). The *R. marina* collected from Clay County, northern Florida, represents a single specimen (Florida Museum of Natural History records; Meshaka et al., 2004) and is not indicative of an established population. Specimens found in Ocala, Marion County, by R. Ashton (in McCann et al., 1996) require further verification to determine if a viable population exists in this county. (Note: The range map of Florida depicted in Lever [2001] is inaccurate in that it depicts the range of *R. marina* as occurring in most of the southwestern counties of the state, rather than the southeastern counties. Smith [2002] also has criticized this map.)"

"Cane Toads failed to establish any reproductive colonies in Louisiana (Easteal, 1981; Lever, 2001, 2003)."

"*Rhinella marina* is not established in Arizona; Howland (1996) is somewhat vague about its ultimate status and it is not listed by Brennan and Holycross (2006)."

"In Hawaii, *R. marina* remains established on the islands of Kauai, Hawaii (Big Island), Maui, Molokai, and Oahu (Smith and Kohler, 1978; Chan and Young, 1985; McCoid and Kleberg, 1995; McKeown, 1996; Collins and Taggart, 2002; Lever, 2003; Thomas, 2006)."

"*Rhinella marina* remains established in Puerto Rico, U.S. Virgin Islands, Guam (including Cocos Island) and Northern Mariana Islands, American Samoa, and Republic of Palau (Oliver, 1949; McCoid, 1993; McCoid and Kleberg, 1995; Powell et al., 1996; Joglar, 1998; Rivero, 1998; Hedges, 1999; Thomas, 1999; Lever, 2001, 2003)."

Means of Introduction into the United States

From Somma (2015):

"Both in the U.S. and worldwide, *R. marina* is normally introduced intentionally in a misguided attempt to control insect agricultural pests, primarily in cane fields (Pemberton, 1933; Lobdell, 1936, 1937; Oliver, 1949, 1955; Oliver and Shaw, 1953; Riemer, 1958; King and Krakauer, 1966; Zug et al., 1975; Easteal, 1981, 1986; Lewis, 1989; Hoser, 1989; McCoid and Kleberg, 1995; McCann et al., 1996; Zweifel, 1998; Cogger, 2000; Lever, 2001; Meshaka et al., 2004). In Florida, intentional and accidental releases from animal importers also have occurred (King and Krakauer, 1966). Those *R. marina* collected from Bay County, in the Florida Panhandle, escaped from a local zoo (Himes, 2007)."

Remarks

From Somma (2015):

"Several authorities have provided morphological and taxonomic reviews or summaries of *R. marina* (Zug and Zug, 1979; Frost, 1985, 2000, 2007; Easteal, 1986; Lever, 2001, 2003; Collins and Taggart, 2002; Haas, 2003; Powell and Henderson, 2003; Pauly et al., 2004; Pough et al., 2004; Bever, 2005; Frost et al., 2006, 2008; Pramuk, 2006; Chaparro et al., 2007). Frost et al. (2006) transferred all New World bufonids out of the genus *Bufo*, consequently placing "*Bufo*" *marinus* into the genus *Chaunus* in their sweeping taxonomic revision of the Amphibia. Systematic research by Pramuk (2006) suggested an additional split within this South American group. More recently, Chaparro et al. (2007) transferred this and some other South American bufonid species into the genus *Rhinella* (Frost, 2007; Frost et al. 2008). The taxonomy of this group remains dynamic. Liner (1994) provided a Spanish vernacular name for *R. marina* in Mexico. Various studies and summaries of the natural history of *R. marina* have been published (Oliver, 1949, 1955;Wright and Wright, 1949; Krakauer, 1968, 1970; Zug et al., 1975; Zug and Zug, 1979; Schwartz and Henderson, 1991; Meyer and Foster, 1996; Murphy, 1997; Campbell, 1998; Lever, 2001; Schlaepfer and Pilgrim, 2003; Vaz-Silva and da Frota, 2004; Manzanilla et al., 2005; Vargas-Salinas, 2005; Duellman, 2005; Laurance and Laurance, 2007). Summaries of the complex history of introductions of Cane Toads worldwide are provided by Oliver (1949), Easteal (1981, 1986, 1989), Easteal and Floyd (1986), and Lever (2001, 2003)."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2015):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata

Superclass Tetrapoda
Class Amphibia
Order Anura
Family Bufonidae
Genus Rhinella
Species *Rhinella marina* (Linnaeus, 1758) – Cane Toad"

"Taxonomic Status: valid"

"Synonyms: *Bufo marinus* (Linnaeus, 1758) [and many others]"

Size, Weight, and Age Range

From Somma (2015):

"*Rhinella marina* is an enormous, warty bufonid (true toad) with a SVL (snout-vent length) of 100-238 mm (4-over 9.25 in) (Conant and Collins, 1998; Lever, 2001). Individuals found in the U.S. rarely exceed 178 mm (7 in) (Conant and Collins, 1998). Females may weigh up to 1.5 kg (3.3 lbs) (Conant and Collins, 1998)."

From CABI (2015):

"It takes a year for the toads to reach maturity, when they will be about 75mm long. Cane toads survival in the wild is unknown, but unlikely to be more than 5 years. Animals kept in captivity are estimated to live 10-40 years (Honolulu Zoo)."

Environment

From CABI (2015):

"Cane toads' original habitat, before their dispersal by humans, was seasonal Amazonian savanna, with small fresh water lakes. Cane toads are found in rain forests, both in their native range and introduced range, such as in Hawaii and New Guinea, though not at high densities (Fred Kraus pers.comm). However, they can now be found in many places, such as man-made ponds, gardens, drain pipes, debris, under cement piles and beneath houses. Cane toads will usually stay on dry land and reproduce in any shallow water near its surroundings. Toads and tadpoles are able to tolerate very high levels of salinity. Tadpoles have been observed in water, metres from the open ocean."

Climate/Range

From Cameron (2015):

"Can survive temperatures ranging from 5ºC - 40ºC"

Distribution Outside the United States

Native

From CABI (2015):

"Cane toads are indigenous to northern South America (Argentina, Bolivia, Brazil, Ecuador, Colombia, Paraguay, Venezuela, the Guianas, Peru, Trinidad and Tobago), Central America, and Mexico […]"

Introduced

From CABI (2015):

"Introduced to: Hawaii, Puerto Rico, U.S. Virgin Islands, Guam and Northern Mariana Islands, American Samoa and the Republic of Palau: found in much of the Caribbean, including Antigua, Barbados, Bermuda, Cuba, Dominica, Grenada and Carriacou Island, Guadeloupe, Grand Cayman Island, Haiti, Dominican Republic, Jamaica (including Cabarita Island), Martinique, Montserrat, Nevis, St. Kitts, St. Lucia and St. Vincent. In the Pacific, Australia, Japan, Papua New Guinea, Philippines, Cook Islands, Micronesia, Fiji Islands, Kiribati, Republic of the Marshall Islands, the Solomon Islands and Tuvalu (USGS). Other worldwide introductions include Egypt, Mauritius and Diego Garcia of the Chagos Archipelago (Easteal, 1981, 1986; Lever, 2001)."

Means of Introduction Outside the United States

From CABI (2015):

"Acclimatisation societies: Cane toads have been introduced to many locations around the world as a biological control agent for crop pests (NR[W], 2001)."

"Natural dispersal: Cane toads have spread over large areas of Australia under their own power (Lever, 2001). In the north of their Australian range, dispersal is primarily effected by adults hopping large distances (up to about 55 km per year), in relatively straight lines. Cane toads in northern Australia are thus the fastest moving anurans yet recorded. This remarkable dispersal ability appears to be the result of strong selection operating on toads over the last seventy years (Philips et al. 2006)."

"Road vehicles: Cane toads have been transported in Australia by large freight trucks or 'road trains' (Sydney Morning Herald, 2002)."

"Seafreight (container/bulk): Cane toads have been found on Norfolk Islands"

"Water currents: Free-swimming cane toad tadpoles are liable to be swept away during flash floods."

Short Description

From CABI (2015):

"Cane toads are heavily built with short legs. […] Fingers lack webbing, but the toes are heavily webbed. Adults have a rough, warty skin, coloured tan, brown or dark brown, dull green or black. The tympanum is distinct, about one half to two thirds the size of the eye. Venom glands are aggregated together to form large and distinctive parotoid glands, found above each shoulder. These glands are able to ooze venom. (Gautherot, 2000)"

Biology

From CABI (2015):

"**Nutrition**

Cane toads eat "almost any terrestrial animal", although they are more likely to consume animals active at ground level during the night. The major diet items are insects, including grass-hoppers, caterpillars and ants, together with millipedes and land snails (Hinkley, 1962 in [Eldredge], 2000)."

"The cane toad is opportunistic in its feeding habits and will consume almost anything that it is able to catch (Zug and Zug, 1979 in Lever, 2001). Terrestrial arthropods make up the bulk of the diet, but snails, crabs, small vertebrates (mammals, birds, lizards and frogs), pet food and human faeces may also be consumed (Lever, 2001). Cane toads will gorge themselves if food is in abundance. Unusual items that cane toads have been observed eating include rotting garbage, a coral snake (*Micrurus circinalis*), fledgling birds and a lit cigarette butt (Lever, 2001)."

"**Reproduction**

Cane toads breed between the months of April and September in the Northern Hemisphere and they can be heard calling their mates, beginning in late March. In the Southern Hemisphere, in Australia, it has been noticed that the male cane toad calls in any month of the year, peaking during the wet season. Every year the female cane toad produces two clutches of about 8,000 to 35,000 eggs. The eggs are externally fertilised by the male's sperm. The eggs can be found floating on the surface of water in a jelly-like string or wrapped around vegetation and other debris in the water. The age and size of the female will determine how many eggs the toad will produce (Honolulu Zoo)."

"**Lifecycle stages**

Cane toad eggs hatch within 24 to 72 hours of laying into tiny, shiny black tadpoles. Tadpoles metamorphose after two to seven weeks (Alford et al. 1995), becoming very small (10-12mm) terrestrial juveniles. These small juveniles experience very high mortality, and unlike adults or larger juveniles they tend to be diurnal. It has been estimated that less 0.5 percent of cane toads toad eggs survive to maturity."

Human Uses

From CABI (2015):

"In the past, cane toads were introduced as a biological control agent for insect pests of sugarcane and other crops."

"Bufotenine toxin produced by the cane toad is used as an aphrodisiac and hair-restorer in Japan. In mainland China it is used to lower the heart rate of patients undergoing cardiac surgery (Musgrave, 1996). The toxin is used by South American Indians on hunting arrows. The toxin is sometimes used as a narcotic by some people (Lever, 2001)."

"Cane toads were used for pregnancy testing in humans. A woman's urine was injected subcutaneously into the lymph glands of a male toad, resulting in spermatazoa becoming present in the toad's urine if the woman was pregnant (Berra, 1998 in Lever, 2001)."

Diseases

From Speare (1990):

"Large numbers of potentially pathogenic bacteria, fungi, protozoa and helminths have been isolated from *B. marinus* but the number of infectious agents reported as causes of disease is small. Pathological lesions have been caused by several bacteria (*Aeromonas hydrophila*, *Mycobacterium* spp., and a Gram negative bacillus, possibly *Fusobacterium necrophorum*), two fungi (*Fonsecaea pedrosoi* and a *Candida* sp.), two protozoa (an unidentified amoeba and an experimental infection with *Trypanosoma cruzi*) and two helminthes (*Spirametra mansoni* and *Rhabdias spherocephala*). Experimental infection with *Toddia* sp., an organism originally described as a protozoan, but probably a virus, resulted in death."

Berger et al. (1998) report that 18 dead or ill *R. marina* (as *Bufo marinus*) showed evidence of chytridiomycosis out of 18 examined.

From Australian Wildlife Health Network (2009):

"Laboratory studies in Australia have shown that both cane toads (*Bufo marinus*) and native frogs are vulnerable to BIV [*Bohle iridovirus*, a ranavirus] (Speare et al., 2001)."

Infection with *Batrachochytrium dendrobatidis* (chytridiomycosis) or with ranavirus is OIE-reportable.

Threat to Humans

From Somma (2015):

"Pets that eat or bite Cane Toads become seriously ill from the milky venom contained within the massive parotoid glands and human poisonings are not unknown (Oliver, 1949; Ashton and Ashton, [1988]; Lee, 1996; McCann et al., 1996; Lever, 2001, 2003; Beltz, 2005). The complex toxic secretion from these glands can be squirted into the eyes when toads are handled roughly,

causing intense pain and a potential medical emergency (Blair, 1947; Lewis, 1989; Lever, 2001)."

"Large numbers of *R. marina* aggregate around artificial bee hives placed near ground level and eat domestic honey bees (Oliver, 1949). Sizable breeding aggregations of chorusing males are a loud nuisance in Puerto Rico (Oliver, 1949)."

3 Impacts of Introductions

From GISD (2010):

"Cane toads will eat "almost any terrestrial animal", although they are more likely to consume those active at ground level during the night (Hinkley 1962). Covacevich and Archer, (1975) in their paper on the effects of the cane toad on indigenous verteberates in Australia, state that snakes, such as the carpet python, the black headed python, death adder and some other snakes have been found dead with the cane toad in their mouths or guts. Studies in Australia where the range of the cane toad is ever expanding have shown that the cane toad plays an important role in structuring native anuran communities (Crossland, 2000) via direct and indirect mechanisms and is thus a threat to the survival of native Australian fauna (Catling,P.C et al.2003)."

"Toads have been implicated in the decline of populations of monitor lizards in Guam (Jackson 1962, Dryden 1965). Pernetta and Watling (1978) consider that the toads do not interact with native frogs because they use different habitats; the frogs are either along stream banks or in the foliage of dense forest. Villadolid (1956) found rats and mice in stomachs of toads in the Philippine Islands. Hinkley concluded that this toad is "economically neutral" because it consumes both "harmful" and "beneficial" invertebrates."

"Overall, the major impacts are on predatory species that attempt to eat toads and then die; in particular, species that normally specialise amphibians, such as Mertens water monitor in northern Australia."

From Somma (2015):

"Although North American predators that normally eat bufonids and their tadpoles may be adapted to dealing with such toxic meals, in areas such as Australia, Papua New Guinea, and Bermuda were no indigenous bufonids occur, anuran predators can suffer ill effects or death (Hoser, 1989; O'Shea, 1990; McCann et al., 1996; Greer, 1997; Crossland and Azevedo-Ramos, 1999; Davenport et al., 2001; Lever, 2001). The toxins found in the eggs and tadpoles can poison some but not all tadpole predators (Crossland and Azevedo-Ramos, 1999; Punzo and Lindstrom, 2001). The same may be true of indigenous Hawaiian predators; however, McKeown (1996) observed a *Palea steindachneri* (wattle-necked softshell), a nonindigenous turtle, eating a *R. marina,* and a similar observation was made of an indigenous opossum in Panama, *Didelphis marsupialis*, successfully consuming this bufonid with no ill effects (Laurance and Laurance, 2007)."

"In Australia, most species of indigenous snakes are potentially, adversely impacted the toxins (Phillips et al., 2003; Phillips and Shine, 2006a). Mortality in populations of two species

indigenous of snakes that have regularly ingested these toxic toads has resulted in the selection against snakes with a gape size large enough to swallow them (Phillips and Shine, 2004; Phillips and Shine, 2006b). Juvenile and small adult Australian snakes of several species may suffer disproportionately greater mortality (Phillips and Shine, 2006b, c); however, a varying effect may occur in within a single species of indigenous snake due to niche partitioning between the sexes, and between adults and juveniles (Webb et al., 2005)."

"In Bermuda, *R. marina* is a potential predatory threat to an endangered endemic lizard, the Bermudian rock skink, *Plestiodon longirostris*, which also might be poisoned by eating the juvenile toads (Davenport et al., 2001; Wingate, [2002])."

"In residential areas of Florida, *R. marina* may displace the native bufonid, *Anaxyrus terrestris* (Krakauer, 1968; Wilson and Porras, [1983]). It is probably the voracious predatory abilities of *R. marina* that may have the most serious impact upon indigenous wildlife (Zweifel, 1998); however, this aspect of its impact remains unstudied (McCann et al., 1996). The nonindigenous tick, *Amblyomma rotundatum*, was introduced to Florida through parasitized *R. marina*, and the common dog hookworm, *Aclyostoma caninum*, was found in the feces of Cane Toads from Tampa (Oliver et al., 1993; Meshaka et al., 2004). Cane Toad tadpoles in Florida, in combination with the presence of the nonindigenous Cuban Treefrog, *Osteopilus septentrionalis*, can negatively impact native tadpole species (Smith, 2005)."

From Greenlees et al. (2006):

"We conducted experimental trials to examine the effect of cane toad presence on invertebrate fauna in relatively small (2.4 x 1.2 m) outdoor enclosures on a floodplain near Darwin in the wet–dry tropics. Toads significantly reduced invertebrate abundance and species richness, but only to about the same degree as did an equivalent biomass of native anurans. Thus, if toads simply replaced native anurans, the offtake of invertebrates might not be substantially different from that due to native anurans before toad invasion. However, our field surveys suggest that toads cause a massive (fourfold) increase in total amphibian biomass. The end result is that cane toads act as a massive nutrient sink in the floodplain ecosystem because they consume vast numbers of invertebrates but (unlike native frogs) are largely invulnerable to predation by frog-eating predators."

From Doody et al. (2015):

"Toad-induced declines in predators can facilitate species that would not readily be predicted to be linked to cane toads. Although the Crimson Finch is a granivore, its eggs are preyed upon by predatory monitor lizards; severe declines in two monitor lizard species apparently resulted in a significant boost in fledging success over a three-year period. […] Our results, along with recent published research, suggest that cane toads are shifting the relative densities of predator and prey species and thus reshaping animal communities in the riparian ecosystem of tropical Australia, via direct impacts on monitor lizards and indirect impacts on their prey (Doody et al. 2009, 2013, 2014, Webb and Manolis 2010)."

4 Global Distribution

Figure 1. Known global distribution of *R. marina*. Map from GBIF (2015). Locations in Canada and the northern U.S. were not included in the climate matching analysis because they do not represent established populations of *R. marina*.

5 Distribution Within the United States

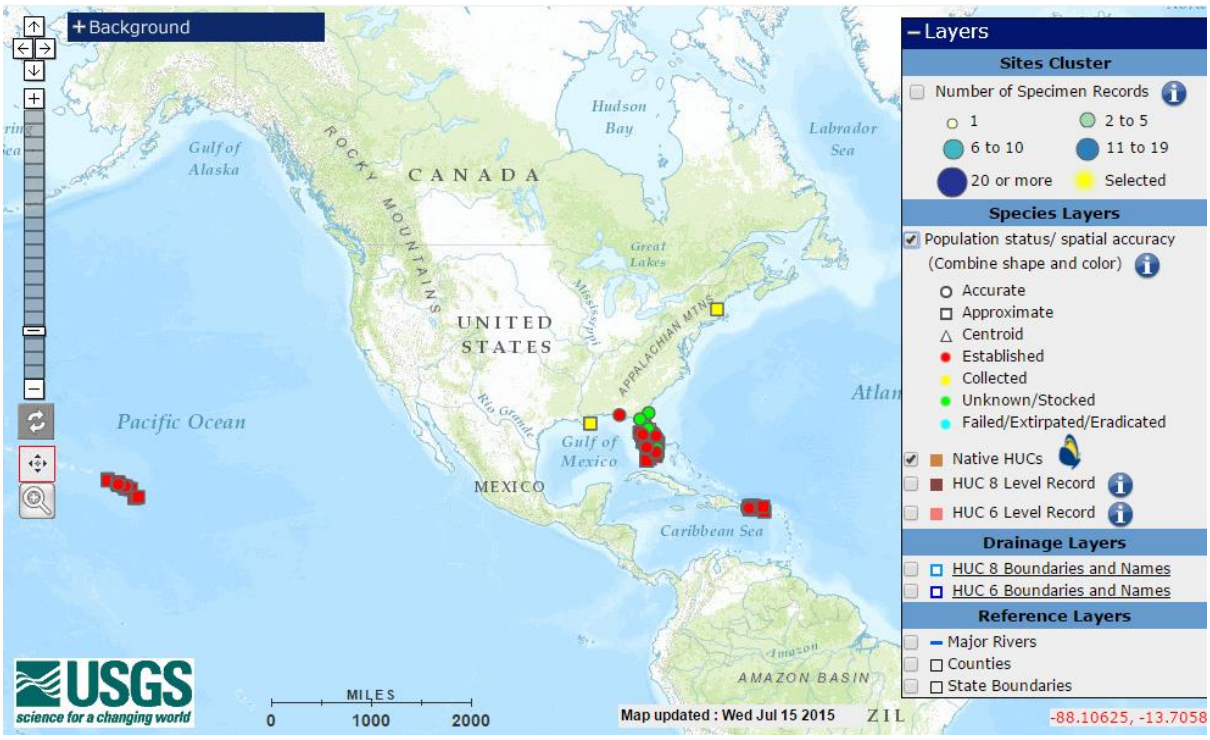

Figure 2. U.S. distribution of *R. marina*. Map from Somma (2015).

6 Climate Match

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) is high in Florida and southern Texas. Moderate climate match stretches up the Atlantic coast to Delaware, all along the Gulf coast, throughout Texas, through the Desert Southwest, and into isolated portions of the Pacific coast. Low climate match is found through much of the East, Midwest, and Interior West. Climate 6 match indicates that the contiguous U.S. has a high climate match overall. The range for a high climate match is 0.103 and greater; Climate 6 score of *R. marina* is 0.194.

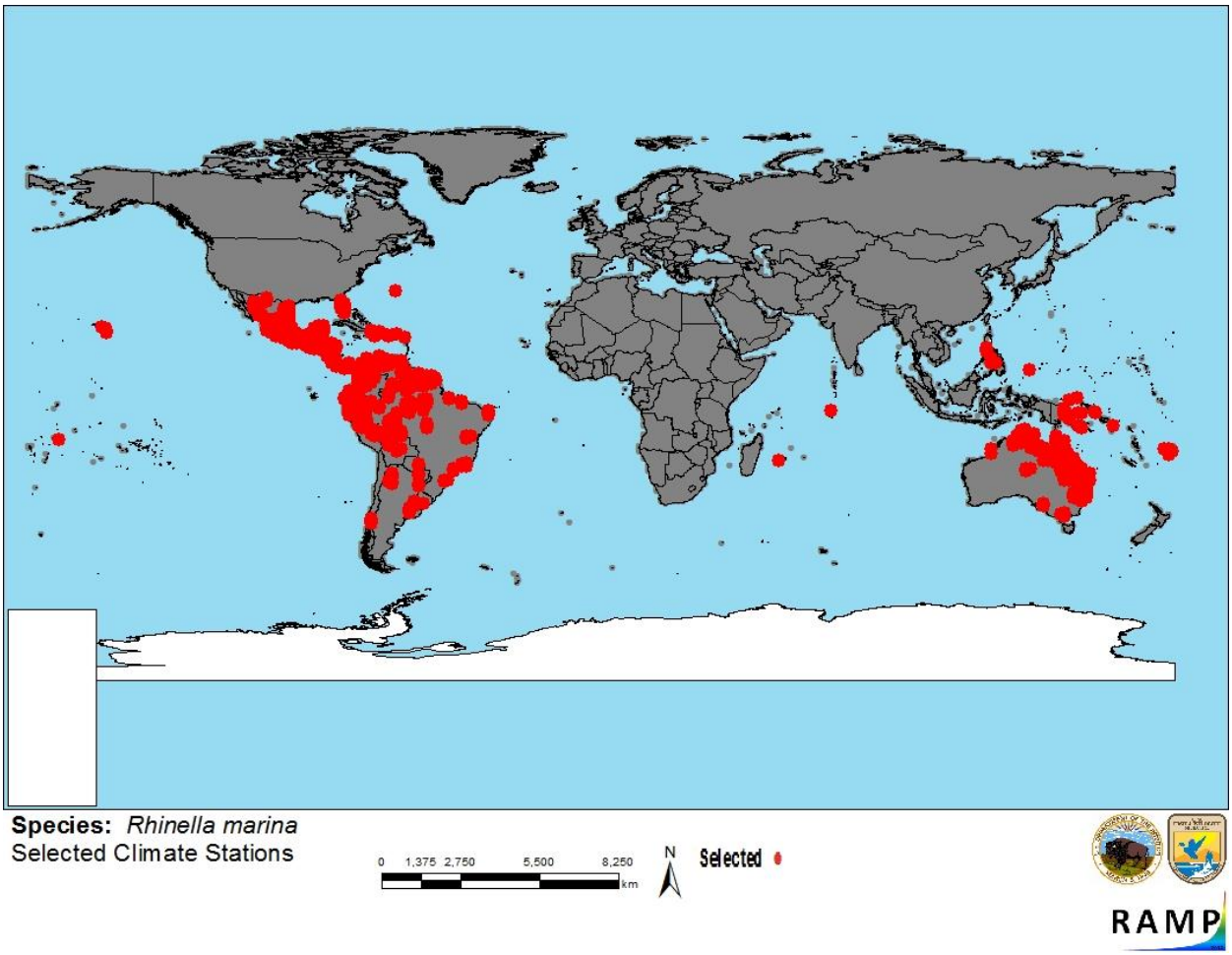

Figure 3. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red; Central America, South America, Caribbean, parts of Southeast Asia and Oceania) and non-source locations (gray) for *R. marina* climate matching. Source locations from CABI (2015) and GBIF (2015). Only established locations were used.

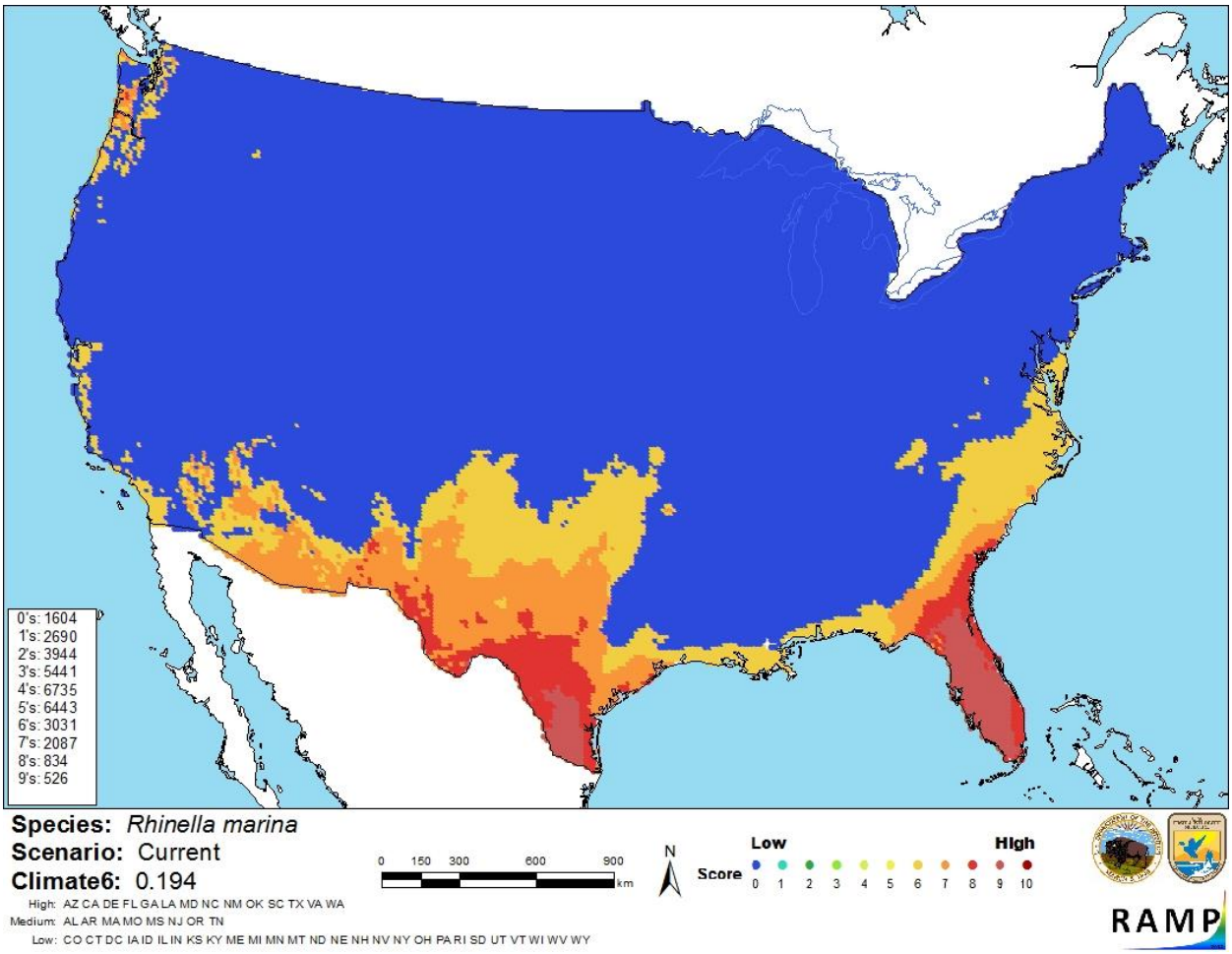

Figure 4. Map of RAMP (Sanders et al. 2014) climate matches for *R. marina* in the contiguous United States based on source locations reported by CABI (2015) and GBIF (2015). 0= Lowest match, 10=Highest match. Climate match scores are tabulated at left.

The "High", "Medium", and "Low" climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
0.000≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

7 Certainty of Assessment

Information on the biology, distribution, and impacts of *R. marina* is readily available. Negative impacts from introductions of this species are adequately documented in the scientific literature. No further information is needed to evaluate the negative impacts the species is having where introduced. Certainty of this assessment is high.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Rhinella marina is a South American toad that has been introduced to and established in many countries in the Pacific and the Caribbean, primarily as biological control for crop pests. The species lays its eggs in fresh water. *R. marina* is omnivorous to the extreme and carries a toxin that can be fatal to potential predators, reducing their populations and sometimes indirectly facilitating prey populations as a result. *R. marina* influences the behavior of native anurans and can displace these species. Some research even indicates rapid directional selection on traits of native species as a result of *R. marina* invasion. *R. marina* is susceptible to two OIE-reportable diseases. Climate match for the contiguous U.S. is high, with highest climate match in Florida (where the species is already established) and southern Texas (where the species is native). Overall risk posed by this species is high.

Assessment Elements

- **History of Invasiveness (Sec. 3): High**
- **Climate Match (Sec. 6): High**
- **Certainty of Assessment (Sec. 7): High**
- **Important Additional Information: Susceptible to infection by *Batrachochytrium dendrobatidis* (chytridiomycosis) and ranavirus.**
- **Overall Risk Assessment Category: High**

9 References

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.

Australian Wildlife Health Network. 2009. Ranaviral disease in amphibians: FACT SHEET. Available: https://www.wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Ranavirus%20(Amphibians)%2026%20Aug%202009%20(1.0).pdf. (July 2015).

Berger, L., R. Speare, P. Daszak, D. E. Green, A. A. Cunningham, C. L. Goggin, R. Slocombe, M. A. Ragan, A. D. Hyatt, K. R. McDonald, H. B. Hines, K. R. Lips, G. Marantelli, and H. Parkes. 1998. Chytridiomycosis causes amphibian mortality associated with population declines in the rain forests of Australia and Central America. Proceedings of the National Academy of Sciences USA 95:9031-9036.

CABI. 2015. *Rhinella marina* (cane toad). CAB International, Wallingford, UK. Available: http://www.cabi.org/isc/datasheet/10333. (July 2015).

Cameron, E. 2015. Cane toad. Australian Museum, Sydney, Australia. Available: http://australianmuseum.net.au/cane-toad. (July 2015).

Doody, J. S., R. Soanes, C. M. Castellano, D. Rhind, B. Green, C. R. McHenry, and S. Clulow. 2015. Invasive toads shift predator-prey densities in animal communities by removing top predators. Ecology 96(9):2544-2554.

GBIF (Global Biodiversity Information Facility). 2015. *Rhinella marina* (Linnaeus, 1758). Global Biodiversity Information Facility, Copenhagen. Available: http://www.gbif.org/species/5216933. (July 2015).

GISD (Global Invasive Species Database). 2010. *Rhinella marina* (=*Bufo marinus*) (amphibian). IUCN Invasive Species Specialist Group, Gland, Switzerland. Available: http://www.issg.org/database/species/ecology.asp?si=113&fr=1&sts=sss&lang=EN. (July 2015).

Greenlees, M. J., G. P. Brown, J. K. Webb, B. L. Phillips, and R. Shine. 2006. Effects of an invasive anuran [the cane toad (*Bufo marinus*)] on the invertebrate fauna of a tropical Australian floodplain. Animal Conservation 9:431-438.

ITIS (Integrated Taxonomic Information System). 2015. *Rhinella marina* (Linnaeus, 1758). Integrated Taxonomic Information System, Reston, Virginia. Available: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=773729. (July 2015).

Sanders, S., C. Castiglione, and M. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.

Speare, R. 1990. A review of the diseases of the cane toad, *Bufo marinus*, with comments on biological control. Australian Wildlife Research 17:387-410.

Somma, L. A. 2015. *Rhinella marina*. USGS Nonindigenous Aquatic Species Database, Gainesville, Florida. Available: http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=48. (July 2015).

10 References Quoted But Not Accessed

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

Alford et al. 1995 [cited by CABI 2015; source did not provide full citation]

Ashton, R. E., Jr., and P. S. Ashton. 1988. Handbook of reptiles and amphibians of Florida, part three: the amphibians. Windward Publishing, Inc., Miami, Florida.

Auth, D. L., H. M. Smith, B. C. Brown, and D. Lintz. 2000. A description of the Mexican amphibian and reptile collection of the Strecker Museum. Bulletin of the Chicago Herpetological Society 35(4):65-85.

Axtell, R. W., and A. O. Wasserman. 1953. Interesting herpetological records from southern Texas and northern Mexico. Herpetologica 9(1):1-6.

Bartlett, R. D. 1994. Florida's alien herps. Reptile & Amphibian Magazine 27:56-73,103-109.

Bartlett, D. [=R. D.] 2002. Krazy for the Keys. Reptiles 10(4):22-26.

Bartlett, R. D., and P. D. Bartlett. 1999a. A field guide to Texas reptiles and amphibians. Gulf Publishing Company, Houston, Texas.

Bartlett, R. D., and P. P. Bartlett. 1999b. A field guide to Florida reptiles and amphibians. Gulf Publishing Company, Houston, Texas.

Beltz, E. 1995. HerPET-POURRI: poisonous amphibians. Bulletin of the Chicago Herpetological Society 30(9):197.

Beltz, E. 2005. Frogs: inside their remarkable world. Firefly Books Ltd, Richmond Hill, Ontario, and Buffalo, New York.

Berra, T. M. 1998. A natural history of Australia. Academic Press, San Diego, California.

Bever, G. S. 2005. Variation in the ilium of North American *Bufo* (Lissamphibia; Anura) and its implications for species-level identification of fragmentary anuran fossils. Journal of Vertebrate Paleontology 25(3):548-560.

Blair, A. P. 1947. Defensive use of parotoid secretion by *Bufo marinus*. Copeia 1947(2):137.

Brennan, T. C., and A. T. Holycross. 2006. Amphibians and reptiles in Arizona. Arizona Game and Fish Department, Phoenix, Arizona.

Butterfield, B. P., W. E. Meshaka, Jr., and C. Guyer. 1997. Nonindigenous amphibians and reptiles. Pages 123-138 *in* D. Simberloff, D. C. Schmitz, and T. C. Brown, editors. Strangers in paradise: impact and management of nonindigenous species in Florida. Island Press, Washington, D.C.

Campbell, J. A. 1998. Amphibians and reptiles of northern Guatemala, the Yucatán, and Belize. University of Oklahoma Press, Norman, Oklahoma.

Campbell, J. A. 1999. Distribution patterns of amphibians in Middle America. Pages 111-210 *in* W. E. Duellman, editor. Patterns of distribution of amphibians: a global perspective. The Johns Hopkins University Press, Baltimore, Maryland.

Cardoza, J. E., G. S. Jones, T. W. French, and D. B. Halliwell. 1993. Exotic and translocated vertebrates of Massachusetts. Fauna of Massachusetts Series 6. Massachusetts Division of Fisheries and Wildlife, Westborough, Massachusetts.

Carmichael, P., and W. Williams. 1991. Florida's fabulous reptiles and amphibians. World Publications, Tampa, Florida.

Catling et al. 2003 [cited by GISD 2010; source did not provide full citation]

Chan, J. G., and L. Y. Young. 1985. *Bufo marinus* (marine toad). Anomaly. Herpetological Review 16(1):23-24.

Chaparro, J. C., J. B. Pramuk, and A. G. Gluesenkamp. 2007. A new species of arboreal *Rhinella* (Anura: Bufonidae) from cloud forest of southeastern Peru. Herpetologica 63(2):203-212.

Cogger, H. G. 2000. Reptiles & amphibians of Australia, 6th edition. Ralph Curtis Publishing, Sanibel Island, Florida.

Covacevich and Archer 1975 [cited by GISD 2010; source did not provide full citation]

Collins, J. T., and T. W. Taggart. 2002. Standard common and current scientific names for North American amphibians, turtles, reptiles & crocodilians, 5th edition. The Center for North American Herpetology, Lawrence, Kansas.

Conant, R., and J. T. Collins. 1998. A field guide to reptiles & amphibians: eastern and central North America, 3rd edition, expanded. Houghton Mifflin Company, Boston.

Crossland 2000 [cited by GISD 2010; source did not provide full citation]

Crossland, M. R., and C. Azevedo-Ramos. 1999. Effects of *Bufo* (Anura: Bufonidae) toxins on tadpoles from native and exotic *Bufo* habitats. Herpetologica 55(2):192-199.

Dalrymple, G. H. 1994. Non-indigenous amphibians and reptiles in Florida. Pages 67-78 *in* D. C. Schmitz, and T. C. Brown, editors. An assessment of invasive non-indigenous species in Florida's public lands. Division of Environmental Resource Permitting, Florida Department of Environmental Protection, Technical Report No. TSS-94-100, Tallahassee, Florida.

Davenport, J., J. Hills, A. Glasspool, and J. Ward. 2001. Threats to the critically endangered endemic Bermudan skink *Eumeces longirostris*. Oryx 35(4):332-339.

Dixon, J. R. 2000. Amphibians and reptiles of Texas, 2nd edition. Texas A & M University Press, College Station, Texas.

Doody, J. S., C. Castellano, D. Rhind, and B. Green. 2013. Indirect facilitation of a native mesopredator by an invasive species: are cane toads reshaping tropical riparian communities? Biological Invasions 15:559-568.

Doody, J. S., B. Green, D. Rhind, C. M. S. R. Castellano, and T. Robinson. 2009. Population-level declines in Australian predators caused by an invasive species. Animal Conservation 12:46-53.

Doody, J. S., P. Mayes, S. Clulow, D. Rhind, B. Green, C. Castellano, D. D'Amore, and C. McHenry. 2014. Impacts of the invasive cane toad on aquatic reptiles in a highly modified ecosystem: the importance of replicating impact studies. Biological Invasions 16:2303-2309.

Dryden 1965 [cited by GISD 2010; source did not provide full citation]

Duellman, W. E. 1999a. Distribution patterns of amphibians in South America. Pages 255-328 *in* W. E. Duellman, editor. Patterns of distribution of amphibians: a global perspective. The Johns Hopkins University Press, Baltimore, Maryland.

Duellman, W. E. 2005. Cusco Amazónico: the lives of amphibians and reptiles in an Amazonian rainforest. Comstock Publishing Associates, Cornell University Press, Ithaca, New York.

Duellman, W. E., and A. Schwartz. 1958. Amphibians and reptiles of southern Florida. Bulletin of the Florida State Museum, Biological Sciences 3(5):181-324.

Duellman, W. E., and S. S. Sweet. 1999. Distribution patterns of amphibians in the Nearctic region of North America. Pages 31-109 *in* W. E. Duellman, editor. Patterns of distribution of amphibians: a global perspective. The Johns Hopkins University Press, Baltimore, Maryland.

Easteal, S. 1981. The history of introductions of *Bufo marinus* (Amphibia: Anura); a natural experiment in evolution. Biological Journal of the Linnean Society 16(2):93-113.

Easteal, S. 1986. *Bufo marinus*. Catalogue of American Amphibians and Reptiles (395):1-4.

Easteal, S. 1989. The effects of genetic drift during range expansion on geographical patterns of variation: a computer simulation of the colonization of Australia by *Bufo marinus*. Biological Journal of the Linnean Society 37(4):281-295.

Easteal, S., and R. B. Floyd. 1986. The ecological genetics of introduced populations of the giant toad, *Bufo marinus*: dispersal and neighbourhood size. Biological Journal of the Linnean Society 27(1):17-45.

Eldredge, L. G. 2000. Non-indigenous freshwater fishes, amphibians, and crustaceans of the Pacific and Hawaiian islands. Pages 173-190 *in* G. Sherley, editor. Invasive species in the Pacific: a technical review and draft regional strategy. South Pacific Regional Environment Programme, Samoa.

Ferriter, A., B. Doren, C. Goodyear, D. Thayer, J. Burch, L. Toth, M. Bodle, J. Lane, D. [C.] Schmitz, P. Pratt, [R. W.] S. Snow, and K. Langeland. 2006. The status of nonindigenous

species in the South Florida environment. Pages 9-1 to 9-102 *in* S. Efron, production manager, and South Florida Environmental Report Production Team, editors. 2006 South Florida environmental report, volume 1. South Florida Water Management District and Florida Department of Environmental Protection, West Palm Beach, Florida.

Fitcher, G. 1970. The new nature of Florida. Florida Wildlife 24(7):10-15.

Flores-Villela, O. 1993. Herpetofauna Mexicana. Carnegie Museum of Natural History Special Publication 17:i-iv,1-73.

Frost, D. R., editor. 1985. Amphibian species of the world: a taxonomic and geographical reference. Allen Press, Inc. and The Association of Systematics Collections, Lawrence, Kansas.

Frost, D. [R.], compiler. 2000. Anura—frogs. Pages 6-17 *in* B. I. Crother, chair, and Committee on Standard English and Scientific Names, editors. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. Society for the Study of Amphibians and Reptiles Herpetological Circular 29:i-iii,1-82.

Frost, D. [R.] 2007. Amphibian species of the world 5.1, an online reference. American Museum of Natural History, New York. Available: http://research.amnh.org/herpetology/amphibia/index.php.

Frost, D. R., T. Grant, J. Faivovich, R. H. Bain, A. Haas, C. F. B. Haddad, R. O. De Sá, A. Channing, M. Wilkinson, S. C. Donnellan, C. J. Raxworthy, J. A. Campbell, B. L. Blotto, P. Moler, R. C. Drewes, R. A. Nussbaum, J. D. Lynch, D. M. Green, and W. C. Wheeler. 2006. The amphibian tree of life. Bulletin of the American Museum of Natural History 297:1-370 + Fig. 50 foldout.

Frost, D. R., R. W. McDiarmid, and J. R. Mendelson III. 2008. Anura—frogs. Pages 2-12 *in* B. I. Crother, chair, and Committee on Standard English and Scientific Names, editors. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding, 6th edition. Society for the Study of Amphibians and Reptiles Herpetological Circular 37:1-84.

Garrett, J. M., and D. G. Barker. 1987. A field guide to reptiles and amphibians of Texas. Texas Monthly Press, Austin.

Gautherot, J. 2000. *Bufo marinus*. James Cook University, Townsville, Queensland, Australia.

Greer, A. E. 1997. The biology and evolution of Australian snakes. Surrey Beatty & Sons Pty Limited, Chipping Norton, Australia.

Haas, A. 2003. Phylogeny of frogs as inferred from primarily larval characters (Amphibia: Anura). Cladistics 19(1):23-89.

Hedges, S. B. 1999. Distribution patterns of amphibians in the West Indies. Pages 211-254 *in* W. E. Duellman, editor. Patterns of distribution of amphibians: a global perspective. The Johns Hopkins University Press, Baltimore, Maryland.

Himes, J. G. 2007. Geographic distribution. *Bufo marinus* (marine toad). Bay County Herpetological Review 38(4):473.

Hinkley, A. D. 1962. Diet of the giant toad, *Bufo marinus* (L.), in Fiji. Herpetologica 18:253-259.

Honolulu Zoo [cited by CABI 2015; source did not provide full citation]

Hoser, R. T. 1989. Australian reptiles & frogs. Pierson & Co, Sydney, Australia.

Howland, J. M. 1996. Herps of Arizona. The Desert Monitor (Phoenix) 27(1):12-17.

Jackson, W. B. 1962. Area of study. Pages 14-20 *in* T. I. Storer, editor. Pacific Island rat ecology. Bernice P. Bishop Museum Bulletin 225.

Joglar, R. L. 1998. Los Coquíes de Puerto Rico. Su Historia Natural y Conservación. Editorial de las Universidad de Puerto Rico, San Juan, Puerto Rico.

King, F. W. 2006. Checklist of Florida amphibians and reptiles [online]. Florida Museum of Natural History, University of Florida, Gainesville, Florida. Available: http://www.flmnh.ufl.edu/herpetology/FL-GUIDE/Flaherps.htm.

King, [F.] W., and T. Krakauer. 1966. The exotic herpetofauna of southeast Florida. Quarterly Journal of the Florida Academy of Sciences 29(2):144-154.

Krakauer, T. 1968. The ecology of the neotropical toad, *Bufo marinus*, in South Florida. Herpetologica 24(3):214-221.

Krakauer, T. 1970. Tolerance limits of the toad, *Bufo marinus*, in South Florida. Comparative Biochemistry and Physiology 33(1):15-16.

Laurance, S. G., and W. F. Laurance. 2007. *Chaunus marinus* (cane toad): predation. Herpetological Review 38(3):320-321.

Lazell, J. D., Jr. 1989. Wildlife of the Florida keys: a natural history. Island Press, Washington, D.C.

Lee, J. C. 1996. The amphibians and reptiles of the Yucatán peninsula. Cornell University Press, Ithaca, New York.

Lever, C. 2001. The cane toad: the history and ecology of a successful colonist. Westbury Academic and Scientific Publishing, Otley, West Yorkshire, UK.

Lever, C. 2003. Naturalized reptiles and amphibians of the world. Oxford University Press, Oxford, UK.

Lewis, S. 1989. Cane toads: an unnatural history. Dolphin/Doubleday, New York.

Liner, E. A. 1994. Scientific and common names for the amphibians and reptiles of Mexico in English and Spanish. Nombres científicos y comunes en Ingles y Españole de los anfibios y los reptiles de México. Society for the Study of Amphibians and Reptiles Herpetological Circular 23:i-vi,1-113.

Lobdell, R. N. 1936. Field and laboratory studies upon insect pests of South Florida with particular reference to methods of control. State Project 87. University of Florida Agricultural Experiment Station Annual Report 1936:123-124.

Lobdell, R. N. 1937. Insect pests and their control. State Project 87. University of Florida Agricultural Experiment Station Annual Report 1937:141-142.

Manzanilla, J., I. Martínez-Solano, M. García-Paris, and D. Buckley. 2005. *Bufo marinus* (cane toad): predation. Herpetological Review 36(3):298-299.

McCann, J. A., L. N. Arkin, and J. D. Williams. 1996. Nonindigenous aquatic and selected terrestrial species in Florida: status, pathways, dates of introduction, range distributions, and significant ecological and economic effects. Florida Caribbean Science Center, U. S. Geological Survey, Gainesville, Florida.

McCoid, M. J. 1993. The "new" herpetofauna of Guam, Mariana Islands. Herpetological Review 24(1):16-17.

McCoid, M. J., and C. Kleberg. 1995. Non-native reptiles and amphibians. Pages 433-437 *in* E. T. LaRoe, G. S. Farris, C. E. Puckett, P. D. Doran, and M. J. Mac, editors. Our living resources: a report to the nation on the distribution, abundance, and health of U. S. ecosystems. U.S. Department of the Interior, National Biological Service, Washington, D.C.

McCranie, J. R., J. H. Townsend, and L. D. Wilson. 2006. The amphibians and reptiles of the Honduran Mosquitia. Krieger Publishing Company, Malabar, Florida.

McCranie, J. R., and L. D. Wilson. 2002. The amphibians of Honduras. Contributions to Herpetology 19. Society for the Study of Amphibians and Reptiles, Ithaca, New York.

McKeown, S. 1996. A field guide to reptiles and amphibians in the Hawaiian Islands. Diamond Head Publishing, Inc., Los Osos, California.

Meshaka, W. E., Jr. 1997. The herpetofauna of Buck Island Ranch: an altered wetland in south-central Florida. Florida Scientist 60(1):1-7.

Meshaka, W. E., Jr. 1999a. The herpetofauna of the Kampong. Florida Scientist 62(3/4):153-157.

Meshaka, W. E., Jr. 1999b. The herpetofauna of the Doc Thomas House in South Miami, Florida. Florida Field Naturalist 27(3):121-123.

Meshaka, W. E., Jr., B. P. Butterfield, and J. B. Hauge. 2004. The exotic amphibians and reptiles of Florida. Krieger Publishing Company, Malabar, Florida.

Meshaka, W. E., Jr., W. F. Loftus, and T. Steiner. 2000. The herpetofauna of Everglades National Park. Florida Scientist 63(2):84-103.

Meyer, J. R., and C. F. Foster. 1996. A guide to the frogs and toads of Belize. Krieger Publishing Company, Malabar, Florida.

Moler, P. 1988. A checklist of Florida's amphibians and reptiles. Nongame Wildlife Program, Florida Game and Fresh Water Fish Commission, Tallahassee, Florida.

Murphy, J. C. 1997. Amphibians and reptiles of Trinidad and Tobago. Krieger Publishing Company, Malabar, Florida.

Musgrave 1996 [cited by CABI 2015; source did not provide full citation]

Natural Resources and Water (NRW). 2006. Fact sheet: cane toad *Bufo marinus*. Queensland Government Department of Natural Resources and Water, Brisbane, Queensland, Australia.

Neill, W. T. 1965. New and noteworthy amphibians and reptiles from British Honduras. Bulletin of the Florida State Museum, Biological Sciences 9(3):78-130.

Oliver, J. A. 1949. The peripatetic toad. Natural History 58(1):29-33.

Oliver, J. A. 1955. The natural history of North American amphibians and reptiles. D. Van Nostrand Company, Inc., Princeton, New Jersey.

Oliver, J. H., M. P. Hayes, K. E. Keirans, and D. R. Lavender. 1993. Establishment of the foreign parthenogenetic tick *Amblyomma rotundatum* (Acari: Ixodidae) in Florida. Journal of Parasitology 79(5):786-790.

Oliver, J. A., and C. E. Shaw. 1953. The amphibians and reptiles of the Hawaiian Islands. Zoologica (New York) 38(5):65-95.

O'Shea, M. T. 1990. The highly and potentially dangerous elapids of Papua New Guinea. Pages 585-640 *in* P. Gopalakrishnakone, and L. M. Chou, editors. Snakes of medical

importance (Asia-Pacific Region). Venom and Toxin Research Group, National University of Singapore, and International Society on Toxinology (Asia-Pacific Section), Singapore.

Pauly, G. B., D. M. Hillis, and D. C. Cannatella. 2004. The history of a Nearctic colonization: molecular phylogenetics and biogeography of the Nearctic toads (*Bufo*). Evolution 58(11):2517-2535.

Pemberton, C. E. 1933. Introduction to Hawaii of the tropical American Toad *Bufo marinus*. Hawaiian Planters' Record 38:15-16.

Pernetta, J. C., and D. Watling. 1978. The introduced and native terrestrial vertebrates of Fiji. Pacific Science 32:223-244.

Phillips, B. L., G. P. Brown, and R. Shine. 2003. Assessing the potential impact of cane toads on Australian snakes. Conservation Biology 17(6):1738-1747.

Phillips, B. L., G. P. Brown, J. K. Webb, and R. Shine. 2006. Invasion and the evolution of speed in toads. Short communications. Nature 439:803.

Phillips, B. L., and R. Shine. 2004. Adapting to an invasive species: toxic cane toads induce morphological change in Australian snakes. Proceedings of the National Academy of Sciences USA 101(49):17150-17155.

Phillips, B. L., and R. Shine. 2006a. Spatial and temporal variation in the morphology (and thus, predicted impact) of an invasive species in Australia. Ecography 29(2):205-212.

Phillips, B. L., and R. Shine. 2006b. An invasive species induces rapid adaptive change in a native predator: cane toads and black snakes in Australia. Proceedings of the Royal Society B: Biological Sciences 273(1593):1545-1550.

Phillips, B. L., and R. Shine. 2006c. Allometry and selection in a novel predator–prey system: Australian snakes and the invading cane toad. Oikos 112(1):122-130.

Pough, F. H., R. M. Andrews, J. E. Cadle, M. L. Crump, A. H. Savitzky, and K. D. Wells. 2004 [2003]. Herpetology, 3rd edition. Pearson Prentice Hall, Upper Saddle River, New Jersey.

Powell, R., and R. W. Henderson. 2003. A second set of addenda to the checklist of West Indian amphibians and reptiles. Herpetological Review 34(4):341-345.

Powell, R., R. W. Henderson, K. Adler, and H. A. Dundee. 1996. An annotated checklist of West Indian amphibians and reptiles. Pages 51-91, plates 1-8 *in* R. Powell, and R. W. Henderson, editors. Contributions to West Indian herpetology: a tribute to Albert Schwartz. Contributions to Herpetology 12. Society for the Study of Amphibians and Reptiles, Ithaca, New York.

Pramuk, J. B. 2006. Phylogeny of South American *Bufo* (Anura: Bufonidae) inferred from combined evidence. Zoological Journal of the Linnean Society 146(3):407-452.

Punzo, F., and L. Lindstrom. 2001. The toxicity of eggs of the giant toad, *Bufo marinus* to aquatic predators in a Florida retention pond. Journal of Herpetology 35(4):693-697.

Renjifo, J. M. [1997]. Ranas y Sapos de Colombia. Editorial Colina, Medellín [and] Santafé de Bogatá.

Riemer, W. J. 1958. Giant toads in Florida. Quarterly Journal of the Florida Academy of Sciences 21(3):207-211.

Rivero, J. A. 1998. The Amphibians and Reptiles of Puerto Rico, 2nd edition, revised. Editorial de la Universidad de Puerto Rico, San Juan, Puerto Rico.

Savage, J. M. 2002. The amphibians and reptiles of Costa Rica: a herpetofauna between two continents, between two seas. The University of Chicago Press, Chicago.

Schlaepfer, M. A., and K. A. Pilgrim. 2003. Geographic distribution: *Bufo marinus* (cane toad). Costa Rica: Puntarenas. Herpetological Review 34(2):161.

Schwartz, A., and R. W. Henderson. 1991. Amphibians and reptiles of the West Indies: descriptions, distributions, and natural history. University of Florida Press, Gainesville, Florida.

Smith, H. M., and A. J. Kohler. 1978. A survey of herpetological introductions in the United States and Canada. Transactions of the Kansas Academy of Science 1977 80(1-2):1-24.

Smith, H. M., and R. B. Smith. 1973. Synopsis of the herpetofauna of Mexico, volume 2. Analysis of the literature exclusive of the Mexican Axolotl. John Johnson Natural History Books, North Bennington, Vermont.

Smith, H. M., and R. B. Smith. 1976. Synopsis of the herpetofauna of Mexico, volume 4. Source analysis and index for Mexican amphibians. John Johnson, North Bennington, Vermont.

Smith, H. M., and R. B. Smith. 1993. Synopsis of the Herpetofauna of Mexico, volume 7. Bibliographic addendum IV and index, bibliographic addenda II-IV, 1979-1991. University Press of Colorado, Niwot, Colorado.

Smith, K. G. 2002. Book review: The cane toad: the history and ecology of a successful colonist by Christopher Lever. Bulletin of the Chicago Herpetological Society 37(6):107-108.

Smith, K. G. 2005. Effects of nonindigenous tadpoles on native tadpoles in Florida: evidence of competition. Biological Conservation 123(4):433-441.

Speare, R., and Steering Committee of Getting the Jump on Amphibian Disease. 2001. Developing management strategies to control amphibian diseases: decreasing the risks due to communicable diseases. School of Public Health and Tropical Medicine, James Cook University, Townsville, Queensland, Australia.

Stevenson, H. S. 1976. Vertebrates of Florida: identification and distribution. University Presses of Florida, Gainesville, Florida.

Stevenson, D., and D. Crowe. 1992. Geographic distribution: *Bufo marinus* (giant toad). Pasco County Herpetological Review 23(3):85.

Sydney Morning Herald. 2002. Bush tucker *Bufo marinus*. Sydney Morning Herald (June 17). Available: http://www.smh.com.au/articles/2002/06/16/1023864379000.html.

Thomas, P. [A.] 2006. Alien species in Hawaii [online]. Hawaiian Ecosystems at Risk (HEAR) Project, Halenkala Field Station, U. S. Geological Survey, Maui, Hawaii. Available: http://www.hear.org/AlienSpeciesIn Hawaii/index.html.

Thomas, R. 1999. The Puerto Rico area. Pages 169-179 *in* B. I. Crother, editor. Caribbean amphibians and reptiles. Academic Press, San Diego, California.

USGS [cited by CABI 2015; source did not provide full citation]

Vargas-Salinas, F. 2005. *Bufo marinus* (cane toad): amplexus displacement. Herpetological Review 36(4):431-432.

Vaz-Silva, W., and J. G. da Frota. 2004. *Bufo marinus* (marine toad): defensive behavior. Herpetological Review 35(4):371.

Villadolid, D. V. 1956. A study of Cotabato rats and their control. Araneta Journal of Agriculture 3:1-45.

Webb, G. J. W., and S. C. Manolis. 2010. Australian freshwater crocodile *Crocodylus johnstoni*. Pages 66–70 *in* S. C. Manolis and C. Stevenson, editors. Crocodiles. Status survey and conservation action plan, Darwin, Australia.

Webb, J. K., R. Shine, and K. A. Christian. 2005. Does intraspecific niche partitioning in a native predator influence its response to an invasion by a toxic prey species? Australian Ecology 30(2):201-209.

Wilson, L. D., and L. Porras. 1983. The ecological impact of man on the South Florida herpetofauna. University of Kansas Museum of Natural History Special Publication 9:i-vi, 1-89.

Wingate, D. [2002.] Saving the skink. Wildlife Bermuda [2002]:30-32.

Wright, A. H., and A. A. Wright. 1949. Handbook of frogs and toads of the United States and Canada, 3rd edition. Cornell University Press, Ithaca, New York.

Zug, G. R., E. Lindgren, and J. R. Pippet. 1975. Distribution and ecology of the marine toad, *Bufo marinus*, in Papua New Guinea. Pacific Science 29(1):31-50.

Zug, G. R., and P. B. Zug. 1979. The marine toad, *Bufo marinus*: a natural history resumé of native populations. Smithsonian Contributions to Zoology 284:i-iv,1-58.

Zweifel, R. G. 1998. Frogs & toads. Pages 76-105 *in* H. G. Cogger, and R. G. Zweifel, editors. Encyclopedia of amphibians & reptiles, 2nd edition. Academic Press, San Diego, California.