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Rana sevosa

Dusky Gopher Frog
Subgenus: Pantherana

family:
[Ranidae](#)

Taxonomic Notes: This species was placed in the genus *Lithobates* by Frost et al. (2006). However, Yuan et al. (2016, Systematic Biology, doi: 10.1093/sysbio/syw055) showed that this action created problems of paraphyly in other genera. Yuan et al. (2016) recognized subgenera within *Rana* for the major traditional species groups, with *Lithobates* used as the subgenus for the *Rana palmipes* group. AmphibiaWeb recommends the optional use of these subgenera to refer to these major species groups, with names written as *Rana* (*Aquarana*) *catesbeiana*, for example.



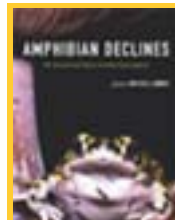
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Conservation Status (definitions)

IUCN (Red List) Status	Critically Endangered (CR)
NatureServe Status	Use NatureServe Explorer to see status.
CITES	No CITES Listing
Other International Status	None
National Status	Endangered
Regional Status	State Endangered in Mississippi



[View distribution map](#) using [BerkeleyMapper](#).

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The following account is modified from *Amphibian Declines: The Conservation Status of United States Species*, edited by Michael Lannoo (©2005 by the Regents of the University of California), used with permission of University of California Press. The book is available from [UC Press](#).

Rana sevosa Goin and Netting, 1940
Dusky Gopher Frog

Stephen C. Richter¹
John B. Jensen²

A recent genetic study of gopher frog (*Rana capito*) populations across the current geographic distribution (Mississippi–North Carolina) by Young and Crother (2001) indicated that the Mississippi population was genetically distinct. Young and Crother

(2001) therefore elevated the Mississippi population to specific status by resurrecting *Rana sevosa* Goin and Netting (1940; dusky gopher frog), because this population is the only one remaining in the historical geographic range of *Rana sevosa* (Louisiana to Mobile County, Alabama) as described by Goin and Netting (1940). Assigning the population discovered in Baldwin County, Alabama, after the publication of Goin and Netting (1940) to *R. sevosa* or *R. capito* is difficult because this population was not included in their study and has since become extinct. Netting and Goin (1942a) assigned this population to *R. sevosa* based on the then known distribution of *R. sevosa* (Louisiana to Mobile County, Alabama) and *R. capito* (Florida to North Carolina). However, populations later discovered in counties proximate to Baldwin County were included in the genetic study of Young and Crother (2001) and were not genetically distinct from all other populations sampled east of the Mobile Bay (thus remaining *R. capito*). Based on this evidence, we assign the Baldwin County population to *R. capito* (as indicated by the geographic range maps) and note the inherent uncertainty. It currently is not possible to determine the location of the contact zone between *R. sevosa* and *R. capito*, but the extensive Mobile Basin creates a logical barrier to dispersal and thus probably separates the two species.

1. Historical versus Current Distribution. Dusky gopher frogs (*Rana sevosa*) are endemic to the coastal plain of Louisiana (Saint Tammany, Tangipahoa, and Washington parishes), Mississippi (Hancock, Harrison, Jackson, and Pearl River counties), and southwestern Alabama (Mobile County; Goin and Netting, 1940; Netting and Goin, 1942a; Altig and Lohoefer, 1983; Dundee and Rossman, 1989). They were last documented in Louisiana in 1967, although they are now thought to be extirpated (R. Thomas, personal communication). Populations from historical localities in Mobile County, Alabama, are also thought to be extinct (Mount, 1990; M. Bailey, personal communication). One population was found in Mississippi (Harrison County) following extensive surveys of historical localities and suitable habitat in the late 1980s, but none has been found since (G. Johnson, personal communication).

2. Historical versus Current Abundance. Although once abundant in coastal Mississippi (Allen, 1932), breeding populations of dusky gopher frogs currently are known from only a single pond (Glen's Pond) located in DeSoto National Forest in Harrison County, Mississippi. Population size at Glen's Pond is relatively small; an average of 57 females/year bred from 1988–2001 (maximum = 130 females; Richter et al., 2003).

3. Life History Features.

A. Breeding.

i. Breeding migrations. Males typically arrive at the breeding ponds earlier than females and begin chorusing (Richter and Seigel, 2002). Breeding occurs from December–April in Louisiana and Mississippi (Dundee and Rossman, 1989; Richter et al., 2003), although earlier chorusing and breeding has occurred following tropical storms and hurricanes (e.g., Seigel and Kennedy, 2000).

ii. Breeding habitat. Dusky gopher frogs typically breed in relatively shallow, ephemeral ponds that contain both emergent and submergent vegetation and are located in upland longleaf pine forests or pine flatlands (Wright and Wright, 1949; Dundee and Rossman, 1989; S.C.R., personal observations).

B. Eggs.

i. Egg deposition sites. Eggs typically are deposited on emergent herbaceous vegetation (Goin and Netting, 1940; Dundee and Rossman, 1989), but have been observed attached to small trees, submergent vegetation, and floating woody debris (S.C.R., personal observations). Egg masses are deposited singly and in more centrally located sites (as opposed to the clumped and peripherally located egg masses of syntopic southern leopard frogs [*R. sphenoccephala*]; Richter, 2000).

ii. Clutch size. Females deposit a single clutch ranging in size from 500–2,800 eggs in Mississippi (Richter and Seigel, 1997, 1998; Richter, 1998). Clutch size estimates in Louisiana ranged from 3,000–7,000 (Volpe, 1957; Dundee and Rossman, 1989). Volpe (1957) measured a mean egg diameter (vitellus) of 1.84 mm (range = 1.67–2.18 mm; $n = 100$; see Volpe [1957] for a detailed account of embryonic development).

C. Larvae/Metamorphosis. Developmental times range from 141–155 days at $20 \pm 3^\circ\text{C}$ in the laboratory (Volpe, 1957) and from 81–179 days in the field (Richter et al., 2003). Volpe (1957) reported a maximum total length of 74 mm for larvae reared in the laboratory (see Volpe, 1957 for a detailed account of larval development to metamorphosis). Size at metamorphosis can vary widely among years, primarily as a result of hydroperiod length (Richter et al., 2003). Smith and List (1955) reported the body size (SVL) of one metamorphic frog in Mississippi as 31 mm. Volpe (1957) reported the mean size of laboratory-reared frogs in Louisiana to be 28.2 mm SVL (range = 26.5–30.1 mm). Richter and Seigel (2002) found variation across years in metamorphic body sizes primarily due to hydroperiod—1997: mean SVL = 35.7 mm ($n = 213$; range = 31.8–42.0 mm) and mean mass = 5.0 g ($n = 213$; range = 3.2–6.8 g); 1998: mean SVL = 29.8 mm ($n = 813$; range = 24.8–34.6 mm) and mean mass = 2.6 g ($n = 813$; range = 1.5–3.9 g). Reproductive success (measured as proportion of metamorphic animals emerging compared to number of eggs deposited) is low (0.35–4.9%; Richter et al., 2003). Estimates for other ranid frogs with similar life histories range from 4.3–5% (Turner, 1960; Herreid and Kinney, 1966; Calef, 1973a).

D. Juvenile Habitat. Juvenile habitat use has not been studied but is assumed to be similar to that of adults.

E. Adult Habitat. Typical non breeding-season habitat consists of both upland and flatland longleaf pine (*Pinus palustris*) forests with relatively open canopies (Dundee and Rossman, 1989). Adults reside in underground retreats associated with gopher tortoise (*Gopherus polyphemus*) and small mammal burrows, stump holes, and root mounds of fallen trees (Allen, 1932; Wright and Wright, 1949; Richter et al., 2001). They often can be seen outside of these retreats during the day (Wright and Wright, 1949; Richter et al., 2001). See “Breeding habitat” above, for further information on adult habitat characteristics.

F. Home Range Size. Unknown.

G. Territories. Doody et al. (1995) observed male–male combat at the breeding pond in Mississippi, which suggests that calling territories are established.

H. Aestivation/Avoiding Dessication. Unknown.

I. Seasonal Migrations. No other migratory events other than breeding migrations are known (see “Breeding migrations” above).

J. Torpor (Hibernation). Dusky gopher frogs typically are active and breed during the winter (Allen, 1932; Dundee and Rossman, 1989; Richter et al., 2003), so torpor likely does not occur.

K. Interspecific Associations/ Exclusions. Dusky gopher frogs inhabit the burrows of gopher tortoises, *Gopherus polyphemus* (Allen, 1932; Wright and Wright, 1949) and small mammals (Richter et al., 2001). Amphibian species currently known to breed in the same pond as dusky gopher frogs, although not necessarily during the same season, include mole salamanders (*Ambystoma talpoideum*), southern cricket frogs (*Acris gryllus*), southern toads (*Bufo terrestris*), eastern narrow-mouthed toads (*Gastrophryne carolinensis*), green treefrogs (*Hyla cinerea*), pine woods treefrogs (*H. femoralis*), barking treefrogs (*H. gratiosa*), squirrel treefrogs (*H. squirella*), spring peepers (*Pseudacris crucifer*), southern chorus frogs (*P. nigrita*), ornate chorus frogs (*P. ornata*), green frogs (*Rana clamitans*), southern leopard frogs (*R. sphenoccephala*), and eastern spadefoot toads (*Scaphiopus holbrookii*; Allen, 1932; G. Johnson and

S.C.R., personal observations).

L. Age/Size at Reproductive Maturity. Richter and Seigel (2002) found a minimum age at maturity for males of 4–6 mo, with a mean length of 56.3 mm SVL and mass of 18.8 g. Average post-metamorphic growth was 20.6 mm SVL (37% increase) and 13.8 g (73% increase). No females originally marked when newly metamorphosed were captured, but age at maturity for females is estimated to be 2–3 yr (Richter and Seigel, 2002).

Adult body size ranges from 56–105 mm and varies between the sexes. Goin and Netting (1940) reported body size for males of 62–84 mm (mean = 73.6 mm; n = 21) and for females of 73–92.5 mm (mean = 82.3 mm; n = 29). Wright and Wright (1949) reported body size for males of 71–92 mm (mean = 82.4 mm; n = 19) and for females of 82–105 mm (mean = 87.5 mm; n = 11). Richter and Seigel (2002) reported variation in body sizes of adults—1996: males 54.0–81.6 mm (mean = 63.2 mm; n = 47), females 69.4–94.4 mm (mean = 82.7 mm; n = 50); 1997: males 59.0–84.0 mm (mean 70.2 mm; n = 50), females 64.6–93.6 mm (mean = 78.0 mm; n = 60); 1998: males 51.4–84.6 mm (mean = 67.7 mm; n = 29), females 69.0–88.3 mm (mean = 79.3 mm; n = 38).

M. Longevity. No data exist on longevity, although Richter et al. (2003) estimated maximum longevity based on recapture data to be 6–10 yr; most adults probably do not exceed 4–5 yr.

N. Feeding Behavior. Dusky gopher frog adults are carnivorous, especially insectivorous, with known gut contents including carabid (*Pasimachus* sp.) and scarabaeid (genera *Canthon* sp. and *Ligryus* sp.) beetles (Netting and Goin, 1942a). They probably have a diet similar to that reported for gopher frogs—frogs, toads, beetles, hemipterans, grasshoppers, spiders, roaches, and earthworms (Dickerson, 1906; Deckert, 1920; Carr, 1940a).

O. Predators. No records of predation on adults or juveniles exist, but predators would be similar to those of other gopher frogs, and other ranid frogs (e.g., snakes, birds, and mammals; Jensen and Richter, **this volume**). Caddisfly (Trichoptera) larvae are known to prey on eggs and larvae (Richter, 2000). No other documentation of larval predation exists, but potential predators include those of other gopher frogs, and those observed in Glen's Pond feeding on southern leopard frog eggs and larvae—dragonfly naiads (Odonata), backswimmers (Hemiptera), giant water bugs (Hemiptera), predaceous diving beetles (Coleoptera), fish, salamanders, snakes, turtles, and birds (Jensen and Richter, **this volume**; S.C.R., personal observations).

P. Anti-Predator Mechanisms. Dusky gopher frogs inflate their bodies and cover their eyes when harassed or grasped by potential predators (S.C.R., personal observations), as is known for crawfish frogs (*Rana areolata*; Altig, 1972a), a sister species. This behavior in dusky gopher frogs is coupled with a milky secretion having a distinct musky odor and bitter taste, which exudes from the dorsal warts (Dickerson, 1906; Goin and Netting, 1940; S.C.R., personal observations). The secretion is composed of a variety of peptides that have a wide range of bioactive properties, some of which are thought to be associated with predator deterrence (C. Graham, S.C.R., P. Flatt, and C. Shaw, unpublished data).

Q. Diseases. Unknown.

R. Parasites. Undescribed. Dusky gopher frogs are presumably susceptible to ticks, *Ornithodoros turicata*, commonly found on gopher tortoises and their burrow commensals, including gopher frogs (Blihovde, 2000a).

4. Conservation. Dusky gopher frogs are thought to be extirpated in Louisiana and Alabama and currently are known only from a single population in southern Mississippi (see "Historical versus Current Distribution" above). They were listed under the U.S.

Endangered Species Act as Endangered on 4 December 2001 (effective 3 January 2002; LaClaire, 2001). Threats to populations are similar to other gopher frogs, primarily involving human-induced stressors (see Jensen and Richter, **this volume**). Currently, conservation efforts are being considered, tested, and/or implemented, including the reintroduction of gopher tortoises to the habitat adjacent to Glen's Pond, artificial lengthening of hydroperiod at Glen's Pond, translocation of eggs to other suitable and/or historical ponds, creation of artificial breeding sites, and alteration of existing ponds (R. Seigel, J. Pechmann, personal communication). In addition, pertinent population genetic data are being collected in order to fully understand the status of this last known population (S.C.R., unpublished data).

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Literature references for *Amphibian Declines: The Conservation Status of United States Species*, edited by Michael Lannoo, are [here](#).

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