

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Pituophis ruthveni

COMMON NAME: Louisiana pine snake

LEAD REGION: 4

INFORMATION CURRENT AS OF: February 2003

STATUS/ACTION (Check all that apply):

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: FR date: 7/18/2000 (2nd petition)

90-day positive - FR date:

12-month warranted but precluded - FR date:

Is the petition requesting a reclassification of a listed species?

Listing priority change

Former LP:

New LP:

Latest date species first became a Candidate: 6/13/2002

Candidate removal: Former LP: (Check only one reason)

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

M - Taxon mistakenly included in past notice of review.

N - Taxon may not meet the Act=s definition of Aspecies.@

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Reptile - Colubridae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Louisiana, Texas

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:

Louisiana, Texas

LEAD REGION CONTACT: Rick Gooch, 404/679-7124

LEAD FIELD OFFICE CONTACT: Jackson, Mississippi Field Office, Linda LaClaire, 601/321-1126

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

Species Description

Pine snakes (genus Pituophis) are large, short-tailed, powerful constricting snakes with keeled scales, a single anal plate (the scale covering the cloaca) and disproportionately small heads (Conant and Collins 1991). Their snouts are pointed and they are good burrowers. The Louisiana pine snake (P. ruthveni) has a buff to yellowish ground color with dark brown to russet dorsal blotches covering its total length (Conant and Collins 1991, Vandeventer and Young 1989). The belly of this pine snake may be unmarked or boldly patterned with black markings. It resembles a rather heavy-bodied bullsnake (P. melanoleucus sayi), but differs from this species by having less dorsal blotches (40 or less). The Louisiana pine snake is variable in both coloration and pattern, but a characteristic feature is that its body markings are always conspicuously different at opposite ends of its body. Blotches run together near the head, often obscuring the ground color, and then become more separate and clear-cut towards the tail. Typically, there are no noticeable head markings, although rarely a light bar or stripe may occur behind the eye. The length of adult Louisiana pine snakes ranges from 48 to 56 inches (122 to 142 centimeters) (Conant and Collins 1991).

Taxonomy

Stull (1929) formally described the Louisiana pine snake as a pine snake subspecies (P. m. ruthveni) based on two specimens taken in Rapides Parish, Louisiana. Reichling (1995) reassessed this snake's taxonomic status and concluded that it is a valid evolutionary species, both geographically isolated and genetically distinct. The Louisiana pine snake has subsequently been accepted as a full species, P. ruthveni (Collins 1997, Crother 2000).

Habitat

Louisiana pine snake habitat consists of longleaf pine savannah with sandy, well-drained soils and substantial herbaceous ground cover. Pocket gophers (Geomys breviceps) are an essential component of this habitat. They create burrow systems where Louisiana pine snakes are most frequently found and are a major source of food for the species (Rudolph and Conner 1996, Rudolph in litt. 1997). Movement patterns of pine snakes are typically from one pocket gopher burrow system to another (Rudolph in litt. 1997).

Historical Range/Distribution

The Louisiana pine snake historically occurred in portions of west-central Louisiana and extreme east-central Texas. This area roughly coincides with a disjunct portion of the longleaf pine ecosystem situated west of the Mississippi River. The range of the Louisiana pine snake included parts of 7 parishes in Louisiana and 15 counties in Texas (Jennings and Fritts 1983, Rudolph 2000, Rudolph et al. 2003). Records from two additional parishes in Louisiana (Williams and Cordes 1996) are considered suspect and have not been included in the historical records database (S. Shively, Louisiana Natural Heritage Program, pers. comm. 1999). Historical records (those prior to 1990) are few, and the Louisiana pine snake is recognized as one of the rarest snakes in North America (Young and Vandeventer 1988). Only two specimens were known prior to collections made in the late 1940's (Wright and Wright 1957). This is unfortunate because most of the sandy longleaf pine dominated savannahs preferred by the Louisiana pine snake had disappeared by the mid-1930's (Bridges and Orzell 1989, Frost 1993). It is likely that much of the loss of Louisiana pine snake habitat occurred in the early 1900's.

Current Range/Distribution

Louisiana pine snakes have not been documented in over a decade in some of the best remaining habitat within their historical range (Rudolph, pers. comm. 1999; S. Shively, pers. comm. 1999). This suggests that the species is no longer present, or extremely rare, in portions of its previous distribution. Surveys documenting the current condition of the fire climax longleaf pine forests, and results of Louisiana pine snake trapping and radio-telemetry, suggest that extensive population declines and local extirpations have occurred during the last 50 to 80 years (Rudolph *in litt.* 1997). Records of the Louisiana pine snake from 1990 to the present include localities in: Bienville, Natchitoches, Sabine, and Vernon parishes in Louisiana; and Angelina, Jasper, Newton, Sabine, and Tyler counties in Texas. Trapping data suggest that the largest population occurs on industrial forest land in Bienville Parish, Louisiana.

Population Estimates/Status

Rudolph (2000) conducted a habitat assessment of all known historical localities of the Louisiana pine snake. Although most of the historical collecting sites are difficult to relocate due to vague locality information, Rudolph felt limited inaccuracy in locating sites should not invalidate overall conclusions about habitat quality. Based on his radio-telemetry research, he made the assumption that viable populations of Louisiana pine snakes are dependent on habitat at the scale of several kilometers (miles). He therefore evaluated habitat within a 2 kilometer (km) (1.24 mile (mi)) radius of the vicinity where a locality was thought to occur. Percent forest cover, percent herbaceous cover, soil type, and the presence or absence of pocket gophers was recorded for each site. Each locality was categorized as excellent, good, marginal, or poor based on this characterization and habitat preferences of the Louisiana pine snake. Rudolph found that the landscape within the 2 km (1.24 mi) radius usually scored predominately in one category. Using this methodology, a total of 75 localities were assessed. Of these, the habitat in only 26 (35%) was considered capable of supporting a viable population of Louisiana pine snakes.

The Louisiana pine snake is a rare species and difficult to trap in the field. Rudolph *et al.* (2003) conducted extensive trapping at 14 sites in 10 counties in Texas and at 9 sites in 5 parishes in Louisiana that were identified as having the best remaining habitat for Louisiana pine snakes. Trapping was conducted in some areas for 1 year, and in others for as long as 5 years, in an attempt to capture snakes for use in radio-telemetry research. Only 26 snakes were trapped in over 98,000 trap days (1 snake/3,775 trap days) from two areas in Louisiana and three areas in Texas. This suggests that extant populations are very small. In addition, due to habitat fragmentation, the populations are restricted to isolated remnant patches of suitable habitat (Rudolph *et al.* 2003). These data should be considered when using the population estimates given below and drawing conclusions concerning the viability of the populations.

A population is being defined here as a record of the species from 1990 or later. Records located within 2 km (1.24 mi) of each other are considered to be the same population. Using the results of Rudolph (2000), it can be estimated that there are 26 extant populations of Louisiana pine snakes. Twenty-one of these populations occur in Louisiana and five in Texas. Eighteen of the 26 (69%) are located in habitat capable of supporting a viable population. The populations are distributed across 3 widely separated areas in 4 parishes in Louisiana and 3 widely separated

areas of 4 counties of Texas. Recent survey results indicate the Texas populations may be in immediate danger of extinction (Rudolph pers. comm. 2003).

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change):

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Both the quantity and quality of longleaf pine savannah have declined sharply in Louisiana and Texas. Virtually all remaining virgin timber in the south was cut during intensive logging from 1870 to 1920 (Frost 1993). In the 1920's, foresters began converting unmanaged woodlands to pine plantations (Frost 1993). Wahlenberg (1946) estimated that in 1935, 1.2 million hectares (approximately 3 million acres) of longleaf pine type forests remained in southwest Louisiana and southeast Texas. However, 43 percent of these longleaf pine types consisted of clear-cuts and only 2.9 percent were uncut old-growth stands. Bridges and Orzell (1989) used published data from the 1980's to make more current estimates of the natural longleaf pine forests remaining in Louisiana and Texas. They estimated that in Louisiana only 15 percent, and in Texas only 7.5 percent, of the 1935 acreages remained. The quality of remaining Louisiana pine snake habitat has been degraded due to logging, fire suppression, short-rotation silviculture, and conversion of habitat to other uses such as grazing.

The Bienville Parish population of Louisiana pine snakes, arguably the largest extant population, occurs on industrial forest land where the current saw timber stands are being harvested (Rudolph in litt. 1999). Depending on future silvicultural practices, this habitat could be substantially degraded within a few years.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Take of Louisiana pine snakes for commercial, recreational, scientific, or educational purposes is not currently considered to be a threat. However, the low number of Louisiana pine snakes makes them vulnerable to unscrupulous collectors should locality data become available.

C. Disease or predation.

Disease or predation is not currently considered to be a threat.

D. The inadequacy of existing regulatory mechanisms.

The Louisiana pine snake is listed as threatened by the state of Texas and protected from unauthorized collection. This regulation does nothing to alleviate the loss of habitat which has caused the decline of the species. There is no protection for the Louisiana pine snake in Louisiana (S. Shively, Louisiana Natural Heritage Program, pers. comm. 1999).

E. Other natural or manmade factors affecting its continued existence.

The longleaf pine savannas occupied by Louisiana pine snakes have historically been maintained by fire. Periodic burning promotes herbaceous vegetation and the presence of pocket gophers, and inhibits a shrubby midstory. Pocket gophers are a major prey item for the Louisiana pine

snake and are also the creators of burrows used extensively by the snakes (Rudolph and Conner 1996). Fire suppression decreases the quantity and quality of habitat available for pocket gophers. Habitat surveys conducted by Rudolph (pers. comm. 1999) indicate that changes in fire regimes may represent the greatest threat to Louisiana pine snake habitat quality in recent years. The use of prescribed burning as a management tool is being restricted by many foresters due to liability concerns. The best remaining Louisiana pine snake population occurs on industrial forest land where burning has been conducted historically. However, in the future it is likely that burning will be replaced, at least partially, by herbicide use on the property. This will result as off-site pine species, which are more easily damaged by fire, are planted in lieu of longleaf pine. The effects of this change are unknown at present. If herbicide use alters the composition and/or density of the ground cover vegetation and pocket gophers decline in response, it is likely that Louisiana pine snakes will decline in numbers as well. Rudolph (in litt. 1999) trapped in poor quality habitat to determine use of these areas by Louisiana pine snakes. These habitats were degraded primarily as a result of fire suppression and the resultant excessively vegetated midstory. No snakes were captured in over 4,000 trap days.

The Louisiana pine snake has an extremely low reproductive rate. It produces a very small clutch of 3 to 5 large eggs (T. Vandevanter, pers. comm. 1999). Low fecundity (reproductive output) magnifies the effect of the other threats and increases the likelihood of local extinctions.

Vehicle mortality, both on state roads and off-road trails, may cause significant impacts to the Louisiana pine snake's population numbers and community structure. Rudolph (et al. 1999) documented the death of 12 snakes from his radio-telemetry study. Three of the 12 (25 %) could be attributed to vehicle mortality. Roads with moderate to high traffic levels reduce adjacent snake populations by 50 to 75 percent and measurable impacts extend up to 850 meters (approximately one-half mile) from the roads (Rudolph et al. 1999, Rudolph in litt. 1997).

FOR RESUBMITTED PETITIONS:

- a. Is listing still warranted? Yes
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
- c. Is a proposal to list the species as threatened or endangered in preparation? No
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded: Since publication of the 2002 CNOR, the publication of a proposed rule to list this species has been precluded by other higher priority listing actions, and based on work scheduled we expect that will remain the case for the remainder of Fiscal Year 2004. Almost the entire national listing budget has been consumed by work on various listing actions taken to comply with court orders and court-approved settlement agreements, emergency listing, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of the Louisiana pine snake as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners):

Ownership is 30 percent Federal (Kisatchie National Forest and Fort Polk in Louisiana; Angelina and Sabine National Forests in Texas) and 70 percent private ownership.

PRELISTING (Describe status of conservation agreements or other conservation activities):

A Conservation Agreement between the Fish and Wildlife Service (Region 2 has lead on the agreement), U.S. Forest Service, U.S. Department of Defense, Texas Parks and Wildlife Department, and Louisiana Department of Wildlife and Fisheries has been drafted and is under review by all parties.

The Service has provided funds, through the Endangered Species Private Landowner Incentive Program, to International Paper for habitat restoration and burning at Louisiana pine snake sites on their property. A habitat management plan for these sites is being developed.

In February 2003, a conservation workshop for the Louisiana pine snake was hosted by the Memphis Zoo, Memphis, Tennessee. It was attended by Federal and state agencies, researchers, and representatives from the forestry industry and The Nature Conservancy. Overall issues and threats to the snake, and possible strategies to deal with them, were discussed. In addition, the captive propagation program and associated research begun at the Memphis Zoo was a subject of discussion. A Louisiana pine snake working group and several committees were setup for future cooperation on conservation efforts for the species.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

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- Reichling, S.B. 1988b. Reproductive biology and current status of the Louisiana pine snake, Pituophis melanoleucus ruthveni. Pp. 95-98 In: M.J. Uricheck (ed.). Proceedings of the Thirteenth Annual International Herpetology symposium. International Herpetological Symposium, Inc., Danbury, CT.
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LISTING PRIORITY (place * after number)

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5*
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: Most of the longleaf pine habitat of the Louisiana pine snake has been destroyed. The habitat that remains has been degraded.

Imminence: Louisiana pine snake habitat loss is continuing, however at a slower rate than in the past. Also, recent developments in a comprehensive partnership are attempting to address the species, its status, and threats to the species and habitat. In February 2003, a conservation workshop for the Louisiana pine snake was hosted by the Memphis Zoo, Memphis, Tennessee. It was attended by Federal and state agencies, researchers, and representatives from the forestry industry and The Nature Conservancy. Overall issues and threats to the snake, and possible strategies to deal with them, were discussed. In addition, the captive propagation program and associated research begun at the Memphis Zoo was a subject of discussion. A Louisiana pine snake working group and several committees were setup for future cooperation on conservation efforts for the species.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: Linda Kelsey March 14, 2003
Acting Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams April 5, 2004
Director, Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date _____

Director's Remarks: _____

Date of annual review: February 2003

Conducted by: Linda LaClaire - Jackson, Mississippi FO

Comments:

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