USFWS

# PROGRAMMATIC CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES

**for the**

**Louisiana Pinesnake in Louisiana**
**(*Pituophis ruthveni*)**

**BETWEEN**

**The Louisiana Department of Wildlife and Fisheries**

**AND**

**The U. S. Fish and Wildlife Service**

**October 17, 2017**

TABLE OF CONTENTS

1. TRACKING NUMBER ..... 4
2. INTRODUCTION ..... 4
3. ENROLLED LANDS ..... 4
3.1. Enrollment Procedures ..... 5
3.2. Content of Conservation Management Agreements ..... 6
4. PARTIES AND POINTS OF CONTACT ..... 6
5. AUTHORITY AND PURPOSE ..... 7
5.1. Authority ..... 7
5.1.1. U.S. Department of the Interior, Fish and Wildlife Service ..... 7
5.1.2. State of Louisiana, Department of Wildlife and Fisheries ..... 8
5.2. Purpose ..... 9
6. BACKGROUND ..... 10
6.1. Description of the Louisiana Pinesnake ..... 10
6.2. Life History ..... 11
6.3. Habitat ..... 12
6.4. Threats Influencing the Survival of the Louisiana Pinesnake ..... 13
6.4.1. The Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range ..... 13
6.4.2. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes ..... 14
6.4.3. Disease or Predation ..... 14
6.4.4. The Inadequacy of Existing Regulatory Mechanisms ..... 15
6.4.5. Other Natural or Manmade Factors Affecting Its Continued Existence ..... 16
7. DESCRIPTION OF EXISTING CONDITIONS WITHIN COVERED AREA ..... 18
8. CONSERVATION MEASURES AND MANAGEMENT ACTIONS ..... 20
8.1. Conservation Measures ..... 20
8.2. Conservation Strategy Commitments ..... 21
8.3. Habitat Management Actions ..... 22
9. COVERED ACTIVITIES ..... 25
10. EXPECTED BENEFITS ..... 26
11. TYPE/AMOUNT OF TAKE/IMPACTS ..... 27
11.1. Type of Take ..... 27
11.2. Amount of Take ..... 27
12. ASSURANCES PROVIDED ..... 28
12.1. Changed Circumstances ..... 29
12.2. Unforeseen Circumstances ..... 29
13. MONITORING AND REPORTING ..... 30
13.1. Monitoring ..... 30
13.2. Reporting ..... 31
14. RESPONSIBILITIES ..... 31
14.1. Enrollee ..... 31
14.2. State of Louisiana, Department of Wildlife and Fisheries ..... 31
14.3. U.S. Department of the Interior, Fish and Wildlife Service ..... 32

15. NOTIFICATION OF TAKE ..... 33
16. DURATION OF CCAA AND PERMIT ..... 33
17. MODIFICATION OF THE CCAA AND CMAS ..... 33
18. AMENDMENT OF THE PERMIT ..... 33
19. TERMINATION OF AGREEMENTS ..... 34
19.1. Termination of the CMA by Enrollees ..... 34
19.2. Termination of the CMA by the Parties ..... 34
19.3. Termination of the CCAA by LDWF ..... 34
20. SUSPENSION OR REVOCATION OF CMA BY LDWF ..... 34
21. PERMIT SUSPENSION OR REVOCATION BY THE SERVICE ..... 35
22. REMEDIES ..... 35
23. DISPUTE RESOLUTION ..... 35
24. SUCCESSION AND TRANSFER OF CMAS ..... 35
25. AVAILABILITY OF FUNDS ..... 35
26. NO THIRD PARTY BENEFICIARIES ..... 36
27. NOTICES AND REPORTS ..... 36
28. SEVERABILITY ..... 36
29. ENTIRE AGREEMENT ..... 36
30. SIGNATURES ..... 37
APPENDIX A: STRESSOR/ACTION/CONSERVATION MEASURE/REPORTING MATRIX ..... A-1
APPENDIX B: COVERED ACTIVITIES, TYPES OF TAKE, AND MINIMIZATION MEASURES ..... B-1
APPENDIX C: LOUISIANA PINESNAKE ENROLLABLE LANDS AND OCCURRENCE MAPS (PARISHES OF OCCURRENCE, OHMCPs) ..... C-1
APPENDIX D: LITERATURE CITED ..... D-1
ATTACHMENTS: COOPERATIVE MANAGEMENT AGREEMENT DOCUMENTS ..... Attachment 1-1

## 1. TRACKING NUMBER:

## TE-06594C

## 2. INTRODUCTION

This agreement between the State of Louisiana Department of Wildlife and Fisheries ("LDWF") and the U.S. Fish and Wildlife Service ("Service"), a bureau of the U.S. Department of the Interior, (jointly "Parties" and individually "Party") is a programmatic Candidate Conservation Agreement with Assurances ("CCAA" or "Agreement") for the Louisiana pinesnake (*Pituophis ruthveni*)("LPS" or "Covered Species") and part of the LDWF's application to the Service for an Enhancement of Survival Permit ("Permit") under section 10(a)(1)(A) of the Endangered Species Act ("ESA") of 1973 (87 Stat. 884, as amended; 16 U.S.C. §1531 et seq.). The Permit would authorize take of the LPS, should it become listed as "endangered" or "threatened" under the ESA during the term of this CCAA. The permitted take would result from activities undertaken in accordance with this CCAA as well as from Cooperative Management Agreements ("CMA" or "CMAs") (Appendix F) entered into by the LDWF and eligible non-Federal landowners ("Enrollee" or "Enrollees") in Louisiana who are willing to engage in voluntary conservation actions on their properties for the LPS. The LDWF will issue a Certificate of Inclusion ("COI") authorizing such take to each Enrollee.

This CCAA is intended to establish a framework for participation by the Parties in specific actions for the LPS's protection, conservation, management, and improvement of status. Implementation of this CCAA is expected to further the conservation of the LPS on private lands by:

- protecting known populations and additional potential habitat by reducing threats to its habitat and survival;
- restoring degraded potential habitat on LPS preferred and suitable soils; and,
- reintroducing captive-bred snakes to select areas of the restored habitat.

## 3. ENROLLED LANDS

The Service and LDWF seek to enroll private forest land located throughout western and central Louisiana for the purpose of implementing habitat management practices under this programmatic CCAA. The geographic area covered by this CCAA includes the LPS's historic range in Bienville, Beauregard, Jackson, Natchitoches, Rapides, Sabine and Vernon Parishes as well as additional lands in Winn, Grant, and Allen Parishes, Louisiana that contain soils preferable or suitable to the LPS, could be restored to suitable habitat conditions, and could potentially be used as future reintroduction sites for the species (Appendix C). The LDWF may enroll non-Federal lands under this CCAA by entering into a CMA with an eligible landowner. State-owned lands managed in accordance with a property-specific agreement may also be enrolled. Each piece of land enrolled hereunder will be an "Enrolled Property."

Lands targeted for LPS habitat management are generally those which possess preferred and

suitable soils as determined by the Landscape Resources Selection Function Model ("LRSF")(Wagner *et al.* 2014) or areas known by land managers to possess deep, sandy soils that would support Baird's pocket gophers (*Geomys breviceps sagittalis*), the primary prey of the LPS. The current land use must be maintained or be capable of being maintained (after restoration) as suitable LPS habitat. Because resources for implementing conservation measures on Enrolled Lands are limited, sites with the highest potential LPS value are prioritized for enrollment. Proximity to existing occupied sites and proximity to other LPS-managed sites, along with LRSF Model soil type, will be used to establish priorities. Lands under the same ownership and adjacent to lands being managed for the benefit of LPS ("Adjacent Lands") also are eligible for enrollment under this CCAA. These Adjacent Lands include areas where ongoing and future activities may result in inadvertent take of the LPS. The amount of Adjacent Land that a property owner may enroll under this CCAA will depend on the circumstances specific to the property and property owner.

After entering into this CCAA and receiving the Permit, LDWF is authorized to begin enrolling land owners through CMAs.

### 3.1. Enrollment Procedures

As a prerequisite to enrolling property under this CCAA, a landowner must demonstrate that such enrollment would result in a conservation benefit for the LPS and that the measures undertaken on the property would contribute to meeting the CCAA Standard (Sections 5.1.1, 5.2, and 8).

In order to enroll a suitable property under the terms of this CCAA, LDWF and the Enrollee must enter into a CMA, wherein the Enrollee would agree to implement specified conservation strategies and measures that satisfy the provisions and intent of this CCAA (Section 8), including forest management beneficial to the LPS, or non-habitat conservation measures (or both). Upon entering into a CMA, the Enrollee will be issued a COI under LDWF's Permit which will provide regulatory assurances that no further land, water, or resource-use restrictions beyond those agreed to in the CMA will be imposed if the LPS is listed in the future. The expiration date of the signed CMAs and associated COIs will be no later than the expiration date of LDWF's Permit. Enrollees will have the option to sign up for a shorter period of time as long as the conservation benefits can be established within the duration of the respective CMA and meet the CCAA standard.

A landowner interested in enrolling their property under this CCAA would follow these steps:

1. The landowner would meet with the LDWF or the Service and discuss the terms and conditions of this CCAA;
2. The landowner would develop a CMA with the LDWF (in cooperation with the Service) designed to beneficially manage the property for the LPS by implementing measures that are sufficient to meet the provisions and intent of this CCAA;
3. Both the landowner and the LDWF would sign the CMA in order for it to be valid;
4. Once the landowner and the LDWF sign the CMA, the landowner would become an Enrollee

and receive a Certificate of Inclusion from the LDWF that provides the Enrollee's regulatory assurances.

### 3.2 Content of CMAs

Each CMA at a minimum shall:

1. Describe the population levels (if available or determinable) and specify the habitats covered, including current stand-level habitat conditions (stand age, tree species, basal area, midstory, and groundcover conditions, if known etc.), and describe the Enrolled Property (such as total acreage being enrolled, existing habitats, with appropriate maps depicting proposed management and acreage for each stand, and property boundaries);
2. Identify when and the manner in which the property habitat conditions were determined, i.e., how the habitat surveys (as well as pocket gopher and LPS surveys, if performed) were conducted and provide such information and surveys to the LDWF and Service for review;
3. Fully describe the agreed-upon stand-level desired future conditions ("DFCs") from section 8, below, that would be managed for the LPS on the Enrolled Property;
4. Identify the specific management actions in accordance with section 8, below, that would be undertaken to accomplish the expected habitat DFCs, where those actions would be performed, and the agreed upon time that the Enrollee would begin to undertake the management actions as well as the period of time that such actions would be undertaken and/or remain in effect to achieve the anticipated DFCs;
5. Describe any potential incidental take associated with the management actions during the term of the CMA;
6. Set forth a schedule and methodology for monitoring the habitat DFCs and/or the LPS population on the Enrolled Property and for implementation of terms and conditions of the CMA and identify any incidental take as authorized by the COI, and the entities responsible for such monitoring activities;
7. Incorporate a requirement for the Enrollee or its agent to obtain any necessary state or federal permits if purposeful take, such as capturing, passive-integrated transponder ("PIT") tagging, reintroducing, etc., may be planned; and
8. Describe the procedure for notifying the other Party of the proposed transfer of the COI to any successor in interest, where appropriate.

## 4. PARTIES' POINTS OF CONTACT

U.S. Fish and Wildlife Service
Louisiana Ecological Services Office
646 Cajundome Blvd., Suite 400
Lafayette, LA 70506
Fish and Wildlife Biologist, David Castellanos
(337-291-3112, david_castellanos@fws.gov)

Louisiana Department of Wildlife and Fisheries
Natural Heritage Program
P.O. Box 98000
Baton Rouge, LA 70898-9000
Program Manager, Carey Lynn Perry
(225-765-3982, cperry@wlf.la.gov)

# 5. AUTHORITY AND PURPOSE

This CCAA was developed to address both the conservation needs of the LPS in the State of Louisiana and the concerns of Louisiana's non-Federal landowners and foresters. It is the result of cooperative efforts initiated by the Parties, the Louisiana Forestry Association (LFA), and several non-Federal landowners who desired to partner to improve the status of the LPS. The LFA will remain a vital partner in the implementation of this CCAA through advising the Parties and Enrollees regarding Sustainable Forestry practices.

## 5.1. Authority

### 5.1.1. Fish and Wildlife Service

The mission of the Service, which is a bureau of the U.S. Department of the Interior, is to work with others to conserve, protect, and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service is responsible for the co-administration of the ESA and for monitoring candidate and species of concern. In 1973, the ESA was enacted for the purpose of conserving threatened and endangered species and preventing their extinction.

The Service's Final Policy for Candidate Conservation Agreements with (USFWS and National Marine Fisheries Service (NMFS) 1999) (64 FR 32726) ("CCAA Policy") is intended to facilitate the conservation of proposed and candidate species and species that are likely to become candidates by giving non-Federal property owners incentives to implement voluntary conservation measures. The incentive or assurances to a property owner is that the Service will impose no further land, water, or resource-use restrictions beyond those agreed to in the CCAA should the covered species later become listed under the ESA. If the species does become listed, the property owner is authorized through the CCAA, Permit, CMA and COI to take the covered species as long as the level of take is consistent with the level identified and agreed upon in the CCAA. Before entering into a CCAA, however, the Service must determine that the benefits of the conservation measures will result in a net conservation benefit for the covered species (the "CCAA Standard").

Sections 2, 6, 7, and 10 of the ESA allow implementation of the CCAA Policy. Section 2(a)(5) of the ESA states that encouraging parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is a key to safeguarding the nation's heritage in fish, wildlife, and plants. Section 2(b) of the ESA

states that "the purposes of this Act are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species." Section 2(c)(1) states that "all Federal departments and agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."

Section 6 of the ESA provides for the cooperation with the states in endangered species conservation, including matching Federal funding and delegation of permitting authority. Collaborative stewardship with state agencies is important in the development of CCAAs, given the statutory role of state agencies and their traditional conservation responsibilities and authorities for resident species.

Section 7 of the ESA requires the Service to review programs it administers and to utilize those programs to further the purposes of the ESA. In establishing the CCAA Policy, the Service is utilizing its Candidate Conservation Program to further conservation of fish, wildlife and plants. By providing assurances to private landowners who are willing to conserve species and their habitats, the Service is helping to conserve the ecosystems upon which endangered and threatened species depend.

Section 10(a)(1)(A) of the ESA allows the Service to issue permits for acts that would otherwise be prohibited by section 9 if such acts are expected to enhance the propagation or survival of the affected species. A well-designed conservation agreement, such as a CCAA, should enhance the survival of the covered species by increasing and improving suitable habitat and removing other threats. Therefore, the Service has determined that a section 10(a)(1)(A) Enhancement of Survival Permit provides the best method for authorizing take under a CCAA. The take that is authorized by such a Permit can assume many forms, but it must be in compliance with the CCAA.

This CCAA is entered into pursuant to the Service's CCAA Policy and implementing regulations at 50 C.F.R. §§17.22(d) and 17.32(d). By entering into this CCAA, the Service is utilizing its Candidate Conservation Program to further the conservation of the nation's fish, wildlife, and plants.

### 5.1.2. Louisiana Department of Wildlife and Fisheries

The mission of the LDWF is to manage, conserve, and promote wise utilization of Louisiana's renewable fish and wildlife resources and their supporting habitats through replenishment, protection, enhancement, research, development, and education for the social and economic benefit of current and future generations; to provide opportunities for knowledge of and use and enjoyment of these resources; and to promote a safe and healthy environment for the users of the resources (LDWF 2010, p. 9). The control and supervision of programs relating to the management, protection, conservation, and replenishment of these resources are assigned to LDWF in the Constitution of the State of Louisiana of 1974,

Article IX, Section 7 and in revised statutes under Title 36 and Title 56. The Louisiana Natural Heritage Program administers the provisions of law and rules and regulations regarding the Threatened and Endangered Species conservation program (Louisiana Acts 1974, No. 473, § 1. Amended by Louisiana Acts 1981, No. 736, § 1). The Louisiana pinesnake is considered a Species of Greatest Conservation Need (Holcomb et al. 2015, p. 60) and is classified as imperiled (S2) by the LDWF.

Under Louisiana Title 36:605, the Secretary of the LDWF may act as the sole agent of the State of Louisiana or designate one of the offices within LDWF or its Assistant Secretary to cooperate with the federal government and with other state and local agencies in matters of mutual concern.

Upon entering into this CCAA, the Service will issue a section 10(a)(1)(A) Enhancement of Survival Permit to the LDWF. Thereafter, the LDWF will be able to enroll eligible non-federal landowners under this CCAA via CMAs and to issue COIs. The LDWF shall have direct control over the Enrollees via the CMAs and COIs pursuant to 50 C.F.R. §13.25 (e)(2).

**5.2. Purpose**

The purpose of this "programmatic" CCAA is for the Service to join with LDWF and those non-federal landowners who choose to become Enrollees to implement conservation measures for the LPS. The conservation measures to be implemented pursuant to this CCAA are intended to maintain or improve habitat for and remove or reduce other threats to the species. Reintroduction/translocation of the LPS to newly created, unoccupied habitat or augmentation of its populations in occupied habitat may also be undertaken under certain circumstances, with landowners' permission, to help recover the species. These actions, would constitute a net conservation benefit for the Covered Species, thus meeting the CCAA Standard.

A programmatic approach is being employed to ensure consistent biological performance standards for all participating Enrollees, to gain efficiency in administering conservation with multiple Enrollees, and to best utilize the capabilities of the LDWF for LPS conservation. The biological performance standards are set forth in section 8, below. The Parties have an interest in using existing programs and partnerships throughout the Covered Area to advance the purposes of this CCAA and to provide financial and technical assistance to landowners interested and willing to conduct voluntary conservation measures for the LPS. Additionally, this CCAA facilitates collaboration between the Parties by identifying expectations, establishing roles and responsibilities, and removing regulatory disincentives.

The goals of this CCAA fall into two main categories:

A. Conservation and Management: By addressing LPS conservation throughout a substantial portion of the species' range, the Parties hope to effectively conserve and increase the LPS populations by:

- developing and implementing habitat management strategies that maintain, enhance, or

restore the species' habitat;
- monitoring the response of the species to conservation and management initiatives;
- increasing the number of non-Federal landowners maintaining, enhancing, or restoring LPS habitat; and,
- providing education and outreach information to private land stakeholders.

B. Cooperation and Collaboration: By managing LPS conservation actions collectively, the Parties will:
- increase consensus and scientific vigor;
- maximize resource (i.e., expertise, funds, insurers, training) availability;
- encourage non-Federal landowners to undertake voluntary conservation measures to improve the conservation status of the LPS;
- improve the chances for the species' long-term conservation and survival;
- enable integration of monitoring and research efforts with habitat management activities (Adaptive Management);
- reduce non-Federal landowners' risk and uncertainty from proactive management that would improve LPS habitat; and,
- provide an organized conservation approach that encourages uniform actions and reporting.

By defining, reviewing, and refining the steps necessary to accomplish and ultimately achieve these goals, the Parties believe that many current and potential threats to the LPS will be significantly reduced and that the species and a significant portion of its habitat can be conserved, enhanced, or restored. The Service will consider the effects of implementation of the conservation measures set forth herein as well as in the 2013 "Candidate Conservation Agreement for the LPS *(Pituophis ruthveni)* between the Service, U.S. Forest Service, Department of Defense, Texas Parks and Wildlife Department, LDWF, and the Association of Zoos and Aquariums" (CCA), as well as any other conservation agreements for the species when determining whether to list the LPS as "threatened" or "endangered" under the ESA. The Parties believe that implementation of the conservation measures of this CCAA will contribute to improving the species' conservation status and have a net conservation benefit to the LPS on the property to be enrolled in the CCAA.

# 6. BACKGROUND

## 6.1. Description of the LPS

Pinesnakes (genus *Pituophis*) are large, short-tailed, non-venomous, powerful constricting snakes with keeled scales, a single anal plate (the scale covering the cloaca) and disproportionately small heads (Conant and Collins 1991, pp. 201-202). Their snouts are pointed and they are proficient burrowers. The LPS has a buff to yellowish background color with dark brown to russet dorsal blotches covering its total length (Vandeventer and Young 1989, p. 35; Conant and Collins 1991, p. 203). The belly of the LPS is unmarked or boldly

patterned with black markings. The LPS 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 background color, and then become more separate and well-defined towards the tail. Typically, there are no noticeable head markings, although rarely a light bar or stripe may occur behind the eye. The typical length of adult LPSs ranges from 122 to 142 centimeters (cm) (48 to 56 inches (in)) (Conant and Collins 1991, p. 203). The largest reported specimen was 178 cm (5.8 feet (ft.)) long (Conant and Collins 1991, p. 203; Davis 1971, p. 145). Stull (1929, pp. 2-3) formally described the LPS as a pinesnake subspecies (*P. melanoleucus ruthveni*) based on two specimens taken in Rapides Parish, Louisiana. Reichling (1995, p. 192) reassessed this snake's taxonomic status and concluded that the LPS was geographically isolated and phenotypically distinct and, thus, a valid evolutionary species.

### 6.2. Life History

Sexual maturity is attained at an approximate length of 120 cm (4 ft.) and an age of approximately three years (Himes *et al.* 2002, p. 686). The LPS is oviparous, with a gestation period of about 21 days (Reichling 1988, p. 77), followed by 60 days of incubation. Having the smallest clutch size (3 to 5) of any North American colubrid snake, the LPS is limited by a remarkably low reproductive rate (Reichling 1990, p. 221). However, the LPS produces the largest eggs (generally 12 cm (5 in) long and 5 cm (2 in) wide) of any U.S. snake (Reichling 1990, p. 221). It also produces the largest hatchlings reported for any North American snake, ranging 45 to 55 cm (18 to 22 in) in length, and up to 107 grams (g) (4 ounces (oz.)) in weight (Reichling 1990, p. 221). Captive LPS can live over 30 years, but females have not been observed to have reproduced beyond the age of 18 years (Reichling 2008a, p. 4, Appendix A).

Telemetry data indicate that the LPS is most often (80.9 percent) found within or near Baird's pocket gopher burrow systems (Ealy *et al.* 2004, p. 389; Himes *et al.* 2006, p. 107) and use the burrow systems as nocturnal refugia, as hibernacula, and as escape from fire (Rudolph and Burgdorf 1997, p. 117; Rudolph *et al.* 1998, p. 147; Ealy *et al.* 2004, p. 386). Himes *et al.* 2006, p. 107) found that the LPS had an average home range size of 33.2 ha (82 ac) (range 6.5 to 108 ha (16 to 267 ac)). Himes (1998, p. 18) found that adult males had larger average home ranges (58.7 ha (145 ac)) than females (14 ha (25 ac)) and juveniles (5.5 ha (13 ac)). Due to its rarity, secretive nature, and preference for occupying pocket gopher burrow systems, the LPS is difficult to locate and capture, even in areas where it is known to occur (Ealy *et al.* 2004, p. 384). No nests of this species have been located in the wild.

The LPS appears to be most active from March-May and September-November (especially November) and least active from December-February and during the summer (especially in the month of August) (Himes 1998, p. 12). Louisiana pinesnakes were observed by Ealy *et al.* (2004, p. 391) to be semi-fossorial and essentially diurnal.

Baird's pocket gophers are the primary prey of the LPS (Himes 2000, p. 97; Rudolph *et al.* 2002, p. 58; Rudolph *et al.* 2012, p. 243) although the species has also been known to eat eastern moles (*Scalopus aquaticus*), mice (*Peromyscus* sp. and *Reithrodontomys* sp.), cotton rats

(*Sigmodon hispidus*), and turtle (probably *Trachemys scripta*) eggs (Rudolph *et al.* 2002, p. 59; Rudolph*et al.* 2012, p. 244).

### 6.3. Habitat

The LPS is known from and associated with the westerly extent of the longleaf pine ecosystem that historically existed in Louisiana and Texas. Longleaf pine forests (which are dominated by longleaf but may also contain other overstory species such as loblolly and shortleaf pine and sparse hardwoods) have the most species-rich herpetofaunal community compared to other similarly sized and located pine forest habitat in North America and harbor more species that are specialists of that habitat (Guyer and Bailey 1993, p. 142). LPS habitat consists of sandy, well-drained soils in open pine forest, a sparse midstory, and well-developed herbaceous ground cover dominated by grasses and forbs (Rudolph and Burgdorf 1997, p. 117). Abundant herbaceous vegetation is important for the LPS because the species' primary prey, the Baird's pocket gopher, is dependent on that vegetation for food. These fire-climax park-like conditions are created and maintained by recurrent low-intensity ground fires that occur on a 3 to 5 year return interval. In the absence of recurrent fire, suitable LPS habitat conditions are lost due to vegetative succession. In one study, using radio-telemetry in Bienville Parish, Louisiana, Himes (1998, p. 17) recorded native LPS (nine adults and one juvenile) most frequently in pine forests (56 percent) followed by pine plantation (23 percent) and clear-cuts (9 percent). The LPS also has been found in grasslands and pine plantations that contain sufficient herbaceous ground cover and sandy soils (Reichling *et al.* 2008, p. 9).

Baird's pocket gophers create the burrow systems in which the LPS is most frequently found (Rudolph and Conner 1996, p. 2; Rudolph and Burgdorf 1997, p. 117; Himes 1998, p. 42; Rudolph *et al.* 1998, p. 146; Rudolph *et al.* 2002, p. 62). Up to 90 percent of radio-tagged snake relocations have been underground in pocket gopher burrow systems, and movement patterns are typically from one pocket gopher burrow system to another. In Louisiana, habitat selection by the LPS seemed to be determined by the abundance and distribution of pocket gophers and their burrow systems (Himes 1998, p. 41). Although active snakes did utilize debris and logs as temporary shelters, they were most often found adjacent to pocket gopher burrows. An LPS disturbed on the surface retreated to nearby burrows, and hibernation sites were always within burrows (Rudolph and Burgdorf 1997, p. 117).

Pocket gopher abundance is dependent upon an abundance of herbaceous groundcover and loose, sandy soils. The amount of herbaceous vegetation is related to canopy cover and midstory density. Generally, a rich, herbaceous ground layer requires a high degree of solar penetration onto the forest floor. Himes (1998, p. 43) found that pocket gopher abundance was associated with a low density of trees and an open canopy, which allowed greater sunlight, more herbaceous understory growth, and better forage for the gopher.

The "Species Assessment and Listing Priority Assignment Form for the Louisiana Pinesnake (*Pituophis ruthveni*)" also provides a thorough discussion of the species' life history, threats to its continued existence, and potential conservation measures (USFWS 2014, http://ecos.fws.gov/docs/candidate/assessments/2014/r4/C02C_V01.pdf).

### 6.4. Threats Influencing the Survival of the LPS

The success of any conservation program is dependent upon eliminating or significantly reducing the impact of threats to the species' existence. The following summarizes the five listing factors identified in section 4(a)(1) of the ESA that the Service must consider in evaluating current threats to the LPS. In addition, identification of the specific threats to the LPS and its habitat provides a framework for implementation of conservation measures to address those threats. Much of the information below comes directly from the most recent Species Assessment and Listing Priority Assignment Form completed for the species (USFWS, 2014).

#### 6.4.1. The Present or Threatened Destruction, Modification, or Curtailment of the LPS's Habitat or Range

Both the quantity and quality of the longleaf pine ecosystem have declined dramatically in Louisiana and Texas since European settlement. Between the 1930s and the 1980s, most of what remained of the natural longleaf pine forest in Louisiana and Texas was converted to extensive pine plantation monocultures (Bridges and Orzell 1989, p. 246), which presumably were not managed for enhancement of herbaceous vegetation. Consequently, the longleaf pine forest that existed as of the late 1980s in Louisiana and Texas has been reduced to 15 and 8 percent, respectively, of the acreage that existed in 1935 (Bridges and Orzell 1989, p. 246). Importantly, the estimated 1935 acreages were a fraction of that which existed pre-European settlement since virtually all virgin timber in the south was cut during intensive logging from 1870 to 1920 (Frost 1993, p. 30). Disruption of natural fire regimes, due to fire suppression and inadequate prescribed burning, is the leading factor responsible for the degradation of the small amount of remaining suitable pine forest habitat within the LPS's range (Rudolph and Burgdorf 1997, p. 118). Habitat surveys conducted by Rudolph (2000, p. 7) indicate that changes in fire regimes may represent the greatest threat to LPS habitat quality in recent years. In the absence of frequent and effective fires, upland pine savannah ecosystems rapidly develop a mid-story of hardwoods and other overstory species that suppress or eliminate any herbaceous understory. Since the presence of pocket gophers is directly related to the extent of herbaceous vegetation available to them, their population numbers and distribution decline with the decline of such vegetation. The resulting reduction of pocket gophers and their distribution directly impacts the number and distribution of the LPS.

All extant LPS populations have been affected by habitat loss and fragmentation and require active management to maintain suitable habitat conditions.

On private land, many open pine habitats containing dense herbaceous vegetation are being (or have been) converted to variable pine plantations with temporally variable canopy cover that are typically harvested on rotations of less than 40 years. These wooded lands generally have sparse and poorly structured understory plant communities during some part of the rotation rendering them intermittently unsuitable for pocket gophers. The use of fire is reduced on privately owned timberland because of the expense or difficulty in obtaining fire

liability insurance, the risk of legal liability, the planting of pine species with reduced tolerance to fire, limited funds and personnel, and smoke management issues. Portions of occupied habitat of the Scrappin' Valley and Bienville populations of the LPS are currently being managed beneficially through voluntary agreements. Future conservation on private lands, which can change ownership and management practices, is uncertain, however, and the remaining land in the estimated occupied habitat areas ("EOHAs") with suitable or preferable soils is generally unsuitable habitat because of the current vegetation structure.

The quality of LPS habitat has been a concern on Federal lands in Louisiana in recent decades due to midstory encroachment and high stand density (Rudolph *et al.* 2006, p. 470). Forest fragmentation by roads and private inholdings and the concomitant smoke management and liability concerns, have hindered prescribed-burning and have caused natural fires to be suppressed in the past. These factors may have limited the development of healthy ground layer herbaceous vegetation in some areas. Since the 2003 signing of the CCA, which was revised in 2013, extensive beneficial habitat management (prescribed burning and thinning) within occupied and potential LPS habitat has occurred on Federal lands (USFWS 2003, pp. 20-27; USFWS 2013, pp. 36-45). These actions have improved habitat conditions on many Federal lands that are believed to contain LPS populations (Rudolph 2008, pers. comm.), and that are not threatened by continuing habitat loss. Detailed reporting of vegetation responses to habitat management would help to quantify the extent of habitat improvement.

There are still areas on private and Federal lands that have been identified by the LRSF Model as potentially preferred LPS habitat but have not yet received beneficial management.

### 6.4.2. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Ongoing take of LPS in Louisiana for commercial, recreational, scientific, or educational purposes has not been considered a threat (Boundy 2008, pers. comm.), and there appears to be little demand for this species by private collectors (Reichling 2008b, pers. comm.; Vandeventer 2016, pers. comm.). The states of Texas and Louisiana require permits for collection of the LPS, and public access is restricted to most private land where extant LPS populations occur. In addition, general public collection of the LPS would be difficult (Gregory 2008, pers. comm.) due to the species' secretive nature, semi-fossorial habits, and current rarity.

### 6.4.3. Disease or Predation

Known natural predators of pinesnakes (*Pituophis*) include mammals such as shrews, raccoons, skunks, and red foxes (Ernst and Ernst 2003, p. 284; Yager et al. 2006, p. 34). All of these species commonly occur within the range of the Louisiana pinesnake. Several of these mammalian predators may be anthropogenically enhanced; that is, their numbers often increase with human development adjacent to natural areas (Fischer *et al.* 2012, pp. 810-

811). Birds, especially hawks, are also known to prey on pinesnakes (Ernst and Ernst 2003, p. 284; Yager *et al.* 2006, p. 34). Some snake species prey on other snakes, including pinesnakes. The scarlet snake (*Cemophora coccinea*) has been documented to prey on northern pinesnake eggs (Burger *et al.* 1992, p. 260). This species is found within the range of the Louisiana pinesnake. An eastern coachwhip (*Masticophis flagellum flagellum*), which is an abundant species in the Louisiana pinesnake's range, was observed attempting to predate a juvenile northern pinesnake in North Carolina (Beane 2014, p. 143). Speckled kingsnakes (*Lampropeltis getula holbrooki*) prey on pinesnakes (Ernst and Ernst 2003, p. 279), and one caught in a trap set for the Louisiana pinesnake was observed to have recently consumed another snake (Gregory 2015, pers. comm.).

Feral hogs, an invasive species, are known to inhabit some habitats occupied by the LPS (Gregory 2016, pers. comm.) and to prey upon vertebrate animals, including snakes (Wood and Roark 1980). However, there is no direct evidence that feral hogs are preying on the LPS or their eggs. Red imported fire ants (*Solenopsis invicta*), another invasive species, have been implicated in trap mortalities of black pinesnakes during field studies (Baxley 2007, p. 17), and they have been documented predating snake eggs under experimental conditions (Diffie *et al.* 2010, p. 294).

While there are no documented occurrences of successful predation (excessive or otherwise) specifically on Louisiana pinesnakes, predation on pinesnakes has been documented (Burger *et al.* 1992, entire; Baxley 2007, p. 17; Ernst and Ernst 2003, p. 284; Ernst and Ernst 2003, p. 284; Yager *et al.* 2006, p. 34). Even with the assumption that the Louisiana pinesnake is currently subject only to natural, historical types and rates of predation without additional pressure from invasive predators (e.g., feral hogs, red imported fire ants), the synergistic effect of that predation, together with other known sources of unnatural mortality on the currently reduced size of remaining Louisiana pinesnake populations, constitutes a threat to the species.

Snake fungal disease ("SFD") is an emerging disease in certain populations of wild snakes. It has been linked to mortality events for other species, and the causative fungus (*Ophidiomyces ophiodiicola*) (Lorch et al. 2015, p. 5, Allender et al. 2015, p 6) has been documented in lesions found on the Louisiana pinesnake (Lorch et. al. in press). While it is suspected of threatening small, isolated populations of susceptible snake species, there currently is no evidence that the disease is affecting the LPS. We know of no other diseases that are affecting the species; therefore, disease is not presently considered a threat to the LPS.

**6.4.4. The Inadequacy of Existing Regulatory Mechanisms**

In Texas, the LPS is listed as state threatened, and unauthorized collection of the species is prohibited (31 TAC §65.171-176). As of February 2013, the unpermitted killing or removal of the LPS from the wild is prohibited in Louisiana (Louisiana Administrative Code, Title 76, Part XV. Reptiles and Amphibians. Chapter 1. §101. J. 3 (f)). Collection or harassment of the LPS is also prohibited on USFS properties in Louisiana (USDA Forest Service 2002,

p. 1), and the capture, removal, or killing of non-game wildlife on Fort Polk and Peason Ridge (DOD land) is prohibited without a special permit (U.S. Department of the Army 2008, p. 6; U.S. Department of the Army 2013, p. 51).

While the LPS itself is protected by the laws of Texas and Louisiana, existing regulatory mechanisms provide no protection from the threat of loss and degradation of the species' habitat on privately owned land, including those that contain the Bienville Louisiana pinesnake populations. Private landowners within some occupied habitat of those populations have committed to binding agreements with the Service to manage those areas with prescribed burns and to promote the longleaf pine ecosystem for 10 years, but the agreements are strictly voluntary. The USFS's Land and Resource Management Plan (Kisatchie National Forest ("KNF")), the Army's Integrated Natural Resources Management Plan ("INRMP") (Fort Polk Main Post and Peason Ridge), and the Louisiana pinesnake CCA all require habitat management that is beneficial to the Louisiana pinesnake for the KNF, Fort Polk/Vernon, and Peason Ridge populations.

In summary, although existing regulatory mechanisms appear to be adequate to prohibit direct harm to individual Louisiana pinesnakes across the species' entire range and to offer some protection to habitat on publicly owned land, there are no protections for the already degraded, fragmented, and declining habitat that exists on private lands.

### 6.4.5. Other Natural or Manmade Factors Affecting Its Continued Existence

The historical loss, degradation, and fragmentation of the longleaf pine ecosystem across the entire historical range of the Louisiana pinesnake have resulted in six natural extant Louisiana pinesnake populations that are isolated and small. Habitat fragmentation and degradation on lands in between extant populations (Rudolph et al. 2006, p. 470) have likely reduced the potential for successful dispersal among remnant populations, as well as the potential for natural recolonization of vacant or extirpated habitat patches. Furthermore, snakes are vulnerable to increased intentional and unintentional mortality when they disperse outside of their home ranges and into developed areas (Bonnet *et al.* 1999, p. 47).

Small, isolated populations resulting from habitat fragmentation are vulnerable to the threats of decreased demographic viability, increased susceptibility of extirpation from stochastic environmental factors (e.g., extreme weather events, epidemic disease), and the potential loss of valuable genetic resources resulting from genetic isolation with subsequent genetic drift, decreases in heterozygosity, and potentially inbreeding depression (Lacy 1987, p. 147). Kwiatkowski et al. (2014, pp. 15-18) found that the wild populations of the Louisiana pinesnake had lower heterozygosity and higher inbreeding than that expected from a randomly breeding population. Low genetic diversity in small, isolated populations has been associated with negative effects on reproduction in snakes (Madsen 1996, p. 116). Recovery of a Louisiana pinesnake population from the existing individuals within the population following a decline is also uncertain because of the species' low reproductive rate (smallest clutch size [three to five] of any North American colubrid snake) (Reichling 1990, p. 221). Additionally, it is extremely unlikely that habitat corridors linking extant

populations will be secured and restored; therefore, the loss of any extant population will be permanent without future reintroduction and successful recruitment of captive-bred individuals.

Roads surrounding and traversing the remaining Louisiana pinesnake habitat pose a direct threat to the species. Population viability analyses have shown that extinction probabilities for some snake species may increase due to road mortality (Row et al. 2007, p. 117). In an assessment of data from radio-tracked eastern indigo snakes (*Drymarchon corais couperi*), it was found that adult snakes have relatively high survival in conservation core areas, but greatly reduced survival in edges of these areas along highways and in suburbs (Breininger et al. 2012, p. 361). In a Texas snake study, an observed deficit of snake captures in traps near roads suggests that a substantial proportion of the total number of snakes may have been eliminated due to road-related mortality (Rudolph et al. 1999, p. 130). That study found that populations of large snakes may be depressed by 50 percent or more due to proximity to roads, and measurable impacts may extend up to approximately 0.5 mi (850 m) from roads.

During a radio-telemetry study in Louisiana and Texas, 3 of the 15 (20 percent) Louisiana pinesnake deaths documented could be attributed to vehicle mortality (Himes et al. 2002, p. 686). Approximately 16 percent (37 of 235) of all documented Louisiana pinesnake occurrences were on roads, and about half of those were dead individuals (Pierce 2015, unpub. data). During Duran's (1998, pp. 6, 34) study on Camp Shelby, Mississippi, 17 percent of the black pinesnakes with transmitters were killed while attempting to cross a road. In a larger study currently being conducted on Camp Shelby, 14 (38 percent) of the 37 pinesnakes found on the road between 2004 to 2012 were found dead, and these 14 individuals represented about 13 percent of all the pinesnakes found on Camp Shelby during that 8-year span (Lyman et al. 2012, p. 42). In Louisiana and Texas, areas with relatively large areas of protected suitable habitat and controlled access, such as Fort Polk, KNF, and Angelina National Forest (ANF), have several roads located within Louisiana pinesnake occupied habitat, and there have been a total of eight known mortalities due to vehicles in those areas (Pierce 2015, unpub. data).

In addition, Dodd et al. (2004, p. 619) determined that roads fragment habitat for wildlife. Clark et al. (2010, pp. 1059-1069) studied the impacts of roads on population structure and connectivity in timber rattlesnakes (*Crotalus horridus*). They found that roads interrupted dispersal and negatively affected genetic diversity and gene flow among populations of this large snake as did mortality and avoidance of roads (Clark et al. 2010, pp. 1059, 1067).

Because extant LPS populations are few in number, small in size, believed to be demographically isolated and produce a relatively small number of eggs, any factor (e.g., further loss of suitable habitat, etc.) that results in a further decline in LPS densities within a remnant population is a threat to the species.

Erosion Control Blankets (ECBs) installed in pipeline, power line, and road rights-of-way have been documented as being an entanglement hazard for many snake species, causing

lacerations and sometimes mortality (Stuart et al. 2001, pp. 162-163; Barton and Kinkead 2005, p. 34A; Kapfer and Paloski 2011, p. 1; Zappalorti 2016, p. 19). This netting often takes years to decompose, creating a long-term hazard to snakes, even when the material has been discarded (Stuart *et al.* 2001, p. 163). Although ECB netting has been demonstrated to have negative impacts on other terrestrial snake species of all sizes, no known instance of injury or death from this netting has been documented for Louisiana pinesnakes and, thus, it is not considered a threat to the Louisiana pinesnake at this time.

Malicious killing of snakes by humans is a significant issue in snake conservation because snakes arouse fear and resentment from the general public (Bonnet et al. 1999, p. 40). Despite Louisiana state law, the intentional killing of LPSs by humans may occur, but given the rarity of the species, such killing is not thought to be a significant source of mortality.

## 7. DESCRIPTION OF EXISTING CONDITIONS WITHIN COVERED AREA

The LPS is recognized as one of the rarest snakes in North America (Young and Vandeventer 1988, p. 203; Himes *et al.* 2006, p. 114) and was classified in 2007 as "endangered" on the IUCN (World Conservation Union) Red List of Threatened Species (version 3.1; http://www.iucnredlist.org/). The LPS historically occurred in portions of northwest and west-central Louisiana and extreme east-central Texas (Conant 1956, p. 19). This area, which is situated west of the Mississippi River, coincides with an isolated and the most westerly occurrence of the longleaf pine ecosystem. Due to the widespread historical loss of longleaf and other pine forests, LPS numbers and occupied range have been reduced throughout the species' historic range (Young and Vandeventer 1988, p. 203; Himes *et al.* 2006, p. 114). Decline on private lands has resulted primarily from fire suppression, conversion to pine silviculture where herbaceous vegetation is diminished, and fragmentation of remaining longleaf pine stands.

Despite being primarily diurnal, the Louisiana pinesnake's apparent rarity, secretive nature, and preference for occupying pocket gopher burrow systems have made it difficult to generate extensive natural history information on the species (Ealy *et al.* 2004, pp. 383–384). Trapping results are functions of trap location selection, trap success, and true presence or absence; thus, trapping data, which only approximate the Louisiana pinesnake's use of an area, are still the best available estimate. Currently trapping is the only standardized and most effective known method for surveying Louisiana pinesnakes. Although not expected, small, isolated, and genetically important LPS groups may exist on private lands in Louisiana. It is anticipated that, through the involvement of Enrollees, a better understanding of the current status of LPS occurrence or absence on enrolled properties will be achieved.

Since 1993, LPS trapping in Louisiana has been conducted by the USFS/KNF, USFS/Southern Research Station ("SRS"), DOD (Fort Polk and the Joint Readiness Training Center ("JRTC")), Memphis Zoo, and LDWF. In total, trapping throughout the historic range of the LPS (including Texas) has resulted in 101 unique individual captures during 448,892 trap days (1993-2015) (Pierce 2015 unpub. data). The USFS/SRS, Wildlife Habitat and Silviculture Laboratory in Nacogdoches, Texas, has compiled and maintains a 'historical records' database (Pierce 2015 unpub. data) of all known LPS locations (excluding telemetry data). Based on this database, there are historical

records for the LPS from seven parishes in Louisiana (Beauregard, Bienville, Jackson, Natchitoches, Rapides, Sabine, and Vernon).

Rudolph *et al.* (2006, p. 467) assessed habitat conditions in Louisiana and Texas during 1999 and 2000 at the locations of all historical LPS records (n = 118 localities) known at that time. Rudolph *et al.* (2006, p. 467) concluded that 70 percent (26 of 37) of the localities on public lands met their criteria for "excellent" or "good" condition, whereas only 33 percent (27 of 81) of the localities on private lands met their criteria for "excellent" or "good" condition. Due to habitat fragmentation, most sites with "excellent" or "good" habitat were isolated and small (typically a few hundred hectares, or less (Rudolph *et al.* 2006, p. 466)). The distribution of the LPS within the current range is further restricted because intensive land use activities and the disruption of natural fire regimes has decreased the quantity and quality of the intervening areas as habitat for this species (Rudolph *et al.* 2006, p. 470). Based on the low capture rates and limited habitat availability, Rudolph *et al.* (2006, p. 467-469) concluded that the failure to document the LPS at known historical localities, coupled with the extensive documented loss, degradation, and fragmentation of longleaf pine habitat, indicates that extant LPS populations were not large and that the LPS has been extirpated from significant portions of its historical range with six occupied areas in existence in Louisiana and Texas at that time. Later, an additional LPS occupied area was observed on the Kisatchie Ranger District ("KRD") of the KNF in Louisiana.

Based on 2016 analysis of occurrence records of parishes with multiple observations since 1993, four naturally occurring, potentially extant, LPS populations occur in four parishes (Bienville, Natchitoches, Sabine, and Vernon) in Louisiana. An additional reintroduction feasibility-study population has been established in Grant Parish, Louisiana (Appendix C). A single observation of a LPS occurred in Rapides Parish, Louisiana in 2001. Those five LPS populations in Louisiana (based upon 1993 - 2015 occurrence data) are primarily concentrated on public lands (DOD lands at Fort Polk and Peason Ridge, Louisiana and the Kisatchie National Forest) and privately-owned timberlands. However, due to the expense and time required for trapping and the only recently available predictive habitat model (LRSF Model) (Wagner *et al.* 2014), LPS surveys have been limited to areas of potential habitat.

In Louisiana, the following EOHAs (since 1993) have been delineated (Appendix C):

(1) Bienville, LA: located on privately owned industrial timberlands in Bienville Parish and a small amount of State lands;
(2) Kisatchie, LA: located on USFS lands (the KRD of the KNF in Natchitoches Parish);
(3) Peason Ridge, LA: located on DOD lands (Peason Ridge Military Reservation in Vernon and Sabine Parishes) and a small amount of private lands;
(4) Fort Polk/Vernon, LA: located on DOD lands (Fort Polk Military Reservation (Main Post)), USFS lands (the Vernon Unit/Calcasieu Ranger District of the KNF in Vernon Parish), and a small amount of private lands; and
(5) Catahoula, LA Reintroduction: located on USFS lands (the Catahoula Ranger District of the KNF in Grant Parish, LA).

Based on historic trap success and individual occurrence records (84 occurrences (including trap recaptures) from 1998 through 2015), the Bienville, LA population is widely believed to be the

largest extant LPS population (Rudolph *et al.* 2006, p. 465; Reichling *et al.* 2008, p. 10, Pierce 2015 unpub. data). Most recent (2003 to 2015) records within the Bienville EOHA have occurred on two disjunct areas (both approximately 850 ac (344 ha) and managed beneficially for Louisiana pinesnake habitat) of privately-owned industrial timberland (Pierce 2015 unpub. data), which is currently the only private land in Louisiana being surveyed.

# 8. CONSERVATION MEASURES AND MANAGEMENT ACTIONS

## 8.1. Conservation Measures

Through implementation of this CCAA, the Parties seek to conserve and increase populations of the LPS and its habitat. This will require a commitment from willing private landowners through management agreements or conservation easements to ensure that source LPS populations persist and that significant portions of LPS habitat that occur on private lands remain suitable into the future. Currently, the Service believes that some appropriate combination of the following conservation measures would need to be implemented on private lands throughout the species' range to ensure the persistence of the LPS and meet the CCAA Standard:

1) Implement habitat management actions (section 8.3) on upland, pine-dominated forests, preferably by applying prescribed fire to maintain/improve herbaceous groundcover conditions and pocket gopher populations on preferable and suitable soils.

2) Implement conservation measures not directly related to habitat management:

   -Within or between known and potential LPS habitat: minimize and/or modify off-road vehicular use, reduce speed, limit use to periods of low LPS activity, consider/continue road closures (gates to control access), and avoid new road construction.

   -Avoid the use of ECBs for erosion control. Instead use wildlife-compatible erosion control measures such as nontoxic, hydraulically applied erosion control products ("HECP"). Less desirable alternative methods include unwoven and unbounded organic fiber matrix type ECBs.

   -On enrolled properties in known occupied areas with recent (within 5 years) Louisiana pinesnake occurrences recorded adjacent to roads under the Enrollee's control, create slow speed zones; where road mortalities or live snake crossings are sighted (2 or more instances occurring within a 0.5 mile diameter area during a period of 2 years or less), install wildlife crossings and associated fencing or implement other measures (any such measure must be coordinated with the Service) to facilitate safe passage of LPSs while moving above ground.

   -Establish and implement land user education programs to reduce the likelihood of direct and indirect mortality of the LPS.

-Create public awareness programs that emphasize the importance of LPS conservation. Distribute outreach materials such as pamphlets, newsletter articles, signage, or other educational materials.

-On enrolled properties not likely to be suitable for the LPS, conservation measures that do not involve habitat management should be commensurate with the acreage of the type of land to be enrolled

**8.2. Conservation Strategy Commitments**

The commitments and actions described in this CCAA focus on targeting conservation, improvement, and management of LPS habitat as well as on educating about the LPS's status and conservation needs to directly address identified threats. Specifically, the Parties and Enrollees are using the best scientific information available to focus specific actions that directly influence the impact of identified threats within habitat that is preferable to the LPS (Appendix A). Because each Party and the prospective Enrollees would be bound hereunder to certain guiding agency/entity requirements based on mission, goals, fiduciary responsibilities, and financial resources, conservation measures and management activities are intended to be adaptable and implemented by Enrollees in accordance with their individual CMAs. Each Enrollee must have committed funding but may seek outside funding for carrying out the specific conservation actions to be implemented as well as collaborate on cost-sharing opportunities when possible. The Parties will meet on an annual basis to evaluate the activities identified below and discuss their effectiveness in conserving the LPS. Enrollee-specific conservation actions will be fully described in the individual CMA developed to maximize available resources on an enrolled property. Appendix A links specific Enrollee actions directly to currently identified threats and provides a mechanism for reporting the impact of those actions.

For all Enrollees, the areas identified in their respective CMA will be treated as habitat management units ("HMUs") for the LPS and managed as such in accordance with the CMA. HMUs will be established by utilizing the LRSF Model in conjunction with professional land-manager expertise to identify and prioritize areas that have the best potential for providing preferential habitat to the LPS regardless of the then existing ground, midstory, or canopy conditions or pocket gopher density. Adverse impacts to the species will be avoided; incidental take will be minimized; and, and beneficial management activities will be continued or implemented.

Furthermore, awareness can promote higher levels of environmental stewardship and protection for the LPS. The Parties acknowledge that education and outreach efforts are integral to the conservation of the LPS. The Parties, in conjunction with the Enrollees, will engage in public awareness programs that emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm, including the protection and prohibition of LPS take (unpermitted killing or removal from the wild). Any newly developed outreach materials related to the LPS and/or

its habitat will be shared among the Parties and Enrollees. Outreach materials can include, but are not limited to, pamphlets, newsletter articles, signage, or other educational materials. Land user awareness programs could include, but are not limited to, wildlife crossing signs, identification and conservation training programs for hunters, foresters, loggers, equipment operators, oil and gas exploration entities, and other stakeholders or lessees of enrolled properties.

### 8.3. Habitat Management Actions

In cooperation with the Parties, each Enrollee will develop a CMA that describes the specific habitat management actions that would be undertaken on the enrolled property to improve or maintain habitat conditions for the LPS. The specific habitat management actions to be undertaken on an enrolled property would be determined through negotiation with the Parties and based on the following factors:

- Conservation priority of the Enrolled Property
    - Prioritization Factors include but are not limited to:
        - Proximity to lands known to be occupied by the LPS;
        - Proximity to federal lands undergoing conservation measures pursuant to the 2013 CCA and to other properties enrolled under this CCAA;
        - Ability to serve as a corridor between known LPS occurrence areas within LPS occupied habitat; and,
        - Preferred soils according to the LRSF model.

- Then existing groundcover, midstory, and canopy conditions

- Then existing management and timber production needs on the enrolled property such as
    - Rotation length;
    - Product objective (fiber or pole production);
    - Tree species (longleaf or other pine species);
    - Capacity to use prescribed fire; and,
    - Other listed species being managed on the enrolled property (i.e., red-cockaded woodpecker)

Notwithstanding that a CMA would be tailored to the specific Enrolled Property, each CMA must sufficiently describe spatially and temporally the combination of habitat management actions that will be undertaken on the property to provide necessary conservation benefits to the LPS and satisfy the CCAA Standard. The following habitat management actions are linked directly to reducing specific threats to the LPS (Appendix A) by restoring or maintaining habitat to achieve the desired future conditions:

<u>Highest Conservation Priority Lands</u>:
Lands that are determined to have the highest conservation priority through evaluation of the prioritization factors above will undergo the most extensive LPS habitat conservation management along with implementation of appropriate non-habitat management measures.

Conservation measure 1of section 8.1, above, must be implemented on these lands. The Louisiana pinesnake is strongly associated with the historic longleaf pine dominated forests of the west central and west northern parts of Louisiana that experienced regular wildfires. Those open canopy forests with a high percent of herbaceous cover consistently provided quality habitat for the pocket gopher and LPS. Consequently, we recommend that the highest priority lands, as determined by the Service and LDWF, should have a longleaf pine restoration component and the use of prescribed fire. Other pine species may be used in the highest priority lands provided management actions are taken to meet mandatory management goals as described below.

The highest priority lands must attain the following management goals:

a) Greater than 40% herbaceous vegetation cover (average cover value determined by ocular estimate in a standard sample area) continuously for at least 90% of the time of the rotation. If prescribed fire is used, the herbaceous vegetation should be dense enough to carry the fire according to the burn interval guidelines described below (referred to as the "groundcover goals"); In the event that 40% herbaceous vegetation cover is not achieved, an Enrollee may be deemed to be in compliance with this measure if : suitable open canopy and midstory control (comparable to the level observed in areas where 40% herbaceous vegetation is achieved) is maintained, and where accumulated organic matter and herbicide application are not inhibiting growth of herbaceous vegetation;;
b) Hardwood midstory (scrub-shrub) covering no more than 15% of the area;
c) Canopy pine trees that are maintained at a stocking sufficient to allow achievement and maintenance of the groundcover goals, which require a sufficiently sparse canopy to allow adequate light penetration to the forest floor. In areas treated with prescribed fire where herbaceous groundcover alone is inadequate to achieve the burn interval guidelines described below, sufficient pine stocking needs to be maintained to provide the needle cast necessary to carry prescribed fire and achieve those goals.
d) The longest feasible harvest rotation interval (potentially managing for saw timber and poles) to reduce potential take of the LPS from entry and to maximize time-availability of suitable groundcover conditions in each stand.

<u>Lower Conservation Priority Lands</u>

Lands that are determined to have a lower conservation priority through evaluation of the prioritization factors above will require comparatively less LPS habitat conservation management (conservation measure 1; section 8.1) than the highest conservation priority lands but also will undergo the appropriate non-habitat management measures (conservation measure 2; section 8.1). Other lower priority lands will only require non-habitat management conservation measures.

On lower conservation priority lands with habitat management action, harvest on pine stands will be scheduled to achieve a spatial pattern and extent of harvested area within managed tracts that is unlikely to compromise the persistence of adequate amounts of suitable LPS

habitat on preferable/suitable soils in the managed areas.

a) Suitable LPS habitat (i.e., >40% herbaceous cover, etc.) should persist in a stand for intervals of at least 11 years if possible (estimated average generation time of LPS);
b) Suitable LPS habitat should be always be available in an adjacent stand within the average estimated home range of LPS; and,
c) Alternatively, on lands with habitat management action: Surveying and documentation of the presence of pocket gopher burrows throughout (forest interior as well as edges) the enrolled property would be accepted as evidence of suitable LPS habitat (assuming that soils are preferable or suitable).

Recommendations for Implementing Habitat Conservation Management

Midstory and ground cover goals can be achieved or maintained on longleaf or other pine forests primarily and preferably through application of prescribed fire throughout the maximum amount of the rotation period, with burn return interval and season of burn adjusted to realize midstory and ground cover goals. General guidelines for prescribed fire are to achieve an average burn return interval of 2 to 3 years (varying the interval from one but no longer than 5 years) and to achieve a mix of dormant season and early and mid-growing season fires after fuel loads have been reduced adequately. In areas with heavy midstory, mechanical shearing (only allowed if no subsurface disturbance) and/or chemical treatment to reduce midstory prior to reintroduction of prescribed fire may be necessary (drum chopping and other forms of significant soil disturbance are not acceptable treatments). Any authorization for treatment with approved herbicide will be set forth in the CMA; herbicides must not be toxic to small mammals. In areas determined to be high priority, if feasible, prescribed fire should be primary treatment for midstory control. Mechanical entry/disturbance for timber harvest and other silvicultural actions should be minimized to the degree practicable, and site preparation methods must minimize soil disturbance. Prescribed fire is recommended for site preparation when feasible. Bedding is not an acceptable treatment for site preparation. Longleaf pine restoration is recommended in areas with suitable conditions. However, other pine species may be used provided management actions are taken to meet groundcover management goals. Longleaf restoration may occur as part of the timber management cycle in accordance a CMA. If feasible, even-aged loblolly or slash pine stands may be transitioned to longleaf stands preferably by regeneration methods conducive to uneven-aged stand structure, such as shelterwood, seed tree, small patch clearcuts, and strip cuts. If even-aged longleaf pine management is used, initial longleaf planting density shall be designed to allow the stand to meet the ground cover goals throughout the maximum amount of the rotation. Where appropriate, non-traditional or innovative longleaf restoration methods may be utilized as a means of testing new approaches.

This CCAA establishes a framework to implement the above measures on enrolled properties in western and central Louisiana. While it is recognized that this CCAA alone will not be able to meet all the necessary rangewide conservation goals for the LPS, it does contribute to LPS conservation goals by seeking to increase and maintain suitable habitat and reduce fragmentation of available habitat for the LPS. These goals will be achieved by implementing the specific conservation measures that produce the desired forest conditions (particularly herbaceous groundcover conditions) described above, reducing take of the LPS, and potentially reintroducing captive bred LPSs (if enough can be produced) onto enrolled properties. These actions would provide a net

conservation benefit to the LPS and, thereby, meet the CCAA standard. Appendix A identifies the potential threats to the LPS, the processes by which those threats are manifested, conservation measures that would address the threats, and the expected conservation benefit of the implemented conservation measures. The specific threats to the LPS on an enrolled property will be identified during the development of the corresponding CMA. Either or both of the Parties will work cooperatively with the Enrollee to develop a conservation plan for the enrolled property that specifies the conservation measures to be implemented and the timing of their application.

In the future, new information may identify additional threats to the LPS that necessitate modification of the conservation measures set forth herein as well as those specified in a CMA or implementation of additional conservation measures. In this event, any such modification and changes may be made in accordance with Sections 12 and 17 of this CCAA.

## 9. COVERED ACTIVITIES

Some of the activities covered by this CCAA are reasonably likely to result in take (specifically death or injury) of the LPS. An Enrollee that engages in actions that are not covered by this CCAA and/or that cause death or injury to a LPS while the species is not federally listed would be in non-compliance with the terms and conditions of this CCAA, and the Enrollee's CMA could be terminated. If an Enrollee engages in actions that are not covered by this CCAA and/or that cause death or injury to a LPS when the species is federally listed, the Enrollee would be held responsible for unauthorized take of the LPS. Appendix B describes covered activities that may result in take of the LPS as well as measures that may be undertaken to minimize take typically when LPS are (or are assumed) to be present. These activities include:

a) conservation measures for the benefit of the LPS such as fire-break construction, prescribed fire, pine and hardwood tree harvest (thinning to increase sunlight on the ground), mid-story and invasive species control, clearcutting, pine tree planting, and equipment movement to facilitate those activities;
b) measures undertaken to benefit the LPS and facilitate, or that are compatible with, the creation, improvement, and maintenance of LPS suitable habitat. Potentially compatible activities include utility right-of-way maintenance, access way use and maintenance, hunting, fishing, limited use of recreational vehicles, horseback riding, camping, hiking, and cattle grazing that do not reduce herbaceous cover to less than 40%; and,
c) certain activities that are carried out on areas of an enrolled property adjacent to areas managed for the benefit of the LPS but that are not beneficial to the species. Activities on areas adjacent to LPS-managed habitat that may be covered include, but are not limited to, all of the above activities and some minor construction, as discussed below.

Minor construction activities associated with existing land uses (e.g., construction of a tractor shed) that are conducted on areas adjacent to lands managed for LPS habitat (includes Lower Conservation Priority Lands not receiving habitat management) and that cause no more than minimal impacts to the species may be covered. Development activities causing more than minimal impacts to the LPS (such as new pipeline construction, residential, retail, etc.) are specifically

omitted from coverage under this CCAA. These higher impact activities are not covered because it is unlikely that take of the LPS could be offset to the degree necessary to meet the CCAA standard thereby making such activities beyond the scope of analysis for this CCAA.

Activities within known, or assumed, LPS-occupied areas are expected to expose LPS to the greatest amount of risk for take. For an activity in occupied habitat to be covered under this CCAA, appropriate take minimization measures must be implemented (Appendix B). The specific take minimization measures appropriate for an activity will depend on the specific circumstances associated with each property and will be identified by LDWF and the Enrollee during development of the CMA.

Activities conducted by an entity other than the Enrollee on the Enrolled Property (e.g., oil and gas exploration, etc.) with or without permission, authorization, or purchased rights, etc., from the Enrollee, that are either not covered in this CCAA (section 9 and Appendix B) or that are performed without the proper take minimization measures are not covered by the CCAA. If the LPS is listed at the time the activity is conducted, that entity, and not the Enrollee, would be responsible for consulting with the Service before undertaking such actions or the entity would be potentially liable for unauthorized take.

## 10. EXPECTED BENEFITS

The conservation measures that will be implemented through this CCAA (Appendix A) are expected to increase the habitat for the LPS and to enhance populations of LPS. The increased habitat and enhanced populations are expected to result in reestablishment of the LPS in the Covered Area. If the level of habitat improvement and protection expected under this Agreement were accomplished throughout the Covered Area, the Service expects that the need to list the LPS would likely be precluded. In addition, conservation of the LPS would be enhanced by improving and encouraging cooperative management efforts between the Parties and private landowners who control most of the LPS habitat within the Covered Area.

The Agreement will also provide conservation benefits for the LPS as a result of LPS Awareness Training provided to land managers, conservation measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of the enrolled properties. Training will emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take (unpermitted killing or removal from the wild).

Where and when deemed necessary and beneficial, and with the landowner's permission, reintroduction of captive-bred LPS onto Enrolled Properties containing large blocks of continuous, suitable (through maintenance or restoration) LPS habitat on preferable soils may ultimately increase LPS occupied range and numbers.

# 11. TYPE/AMOUNT OF TAKE/IMPACTS

## 11.1. Type of Take

There are no published or unpublished studies examining whether the LPS is likely to be killed or injured during routine land management activities. Accordingly, the Service is relying on information on the life history and habitat preferences for the species, personal observation of the species, and familiarity with the land management activities that promote suitable habitat conditions to assess the type and amount of take (Appendix B). The take minimization measures described in Appendix B are expected to prevent take of the LPS for most covered activities in most situations. However, over the 99-year term of this CCAA, the Service believes that LPSs are likely to be incidentally taken on Enrolled Properties.

In the rare instances when take does occur, we expect it will be in the form of killing (e.g., accidental crushing by timber harvest machinery or felling of trees), harassment (e.g., flushing of LPSs into less secure habitat exposing them to increased risks of exposure to predation or on- or off-road vehicle mortality), and harm (e.g., habitat modification that reduces available pocket gopher burrows). With implementation of the take minimization measures (Appendix B), the covered activities in most situations are expected to result in mostly minor, but occasionally moderate, overall disturbance to the LPS. Because the LPS is a habitat specialist, take will most commonly occur only in the currently limited instances when activities such as those previously mentioned are conducted within occupied suitable habitat. For example, when midstory removal is carried out within occupied areas, the LPS may be temporarily displaced to less suitable habitats and become exposed to an increased risk of predation.

## 11.2. Amount of Take

The amount of take that will occur under this CCAA is difficult to determine because there are no studies examining the short-term or long-term deleterious effects of timber management activities on the LPS, and the number of potential enrollees and enrolled acreage is uncertain. In addition, the detection of LPS mortality is made difficult by their life history trait of using pocket gopher burrows for refugia and hibernacula. The Service believes that the likelihood that any individual activity will cause take of LPSs in any given year will typically be very low. However, considering all of the potential management activities together, it is reasonably certain that some take will occur each year if large amounts of land are actively under management.

The Louisiana pinesnake would be at most risk from vehicle or equipment encounters when they are on the surface moving between gopher burrow complexes. The Service expects some instances of incidental take of Louisiana pinesnake will be difficult to detect because snakes located underground could also be killed, injured, or stressed by actions above the soil surface, such as burrow collapse caused by crossing ORVs or forestry management equipment, and the take would likely not be measurable. Based on Fort Polk's Tunnel Collapse Pilot Study (Army 2015b, Appendix B), common knowledge of forestry and land management practices, and the

low likelihood of Louisiana pinesnake use of formerly unsuitable sites, survival of Louisiana pinesnakes in pocket gopher tunnels crossed by vehicles, mowers, or other mechanical equipment is expected to be high based on low rates of tunnel collapse. In some instances, mechanical mowing may be used within non-forested portions of any enrolled property to control woody encroachment that is not controlled by prescribed fire annually. Earth-moving equipment may also be used to prepare a new site for initial planting. Accordingly, the Service anticipates that implementation of the proposed actions may result in take of the Louisiana pinesnake in the form of mortality due to harm that may be attributable to the following project-related effects:

1. Animal encounters with vehicles both on- and off-road during land management activities, recreational hunting, and forest management activities (i.e., establishment of firebreaks and timber harvest). Such encounters may occur above-ground via "road kills" or tree removal and below-ground via pocket gopher tunnel collapse.
2. Animal encounters with mechanical mowing equipment during land management activities.

Although the proposed activities may temporarily adversely affect the Louisiana pinesnake on an individual level, the resulting long-term maintenance of suitable habitat through the proposed timber management activities will provide an overall benefit to the species at a population level. Given the current status of the species, the best available data of known populations, the species' estimated range, and the proposed long-term habitat maintenance, it is the Service's conference opinion that the estimated level of take over a 99-year period is not likely to jeopardize the continued existence of the Louisiana pinesnake.

## 12. ASSURANCES PROVIDED

Upon approval of this CCAA and satisfaction of all other applicable legal requirements, the Service will issue an Enhancement of Survival Permit to the LDWF in accordance with section 10(a)(1)(A) of the ESA and the Service's implementing regulations at 50 C.F.R. §§ 17.22(d) and 17.32(d). If in the future the Service lists the LPS as a "threatened" or "endangered" species, the Permit will authorize incidental take of LPSs by LDWF and its Enrollees resulting from otherwise-lawful activities on the Enrolled Properties. The Permit will authorize both incidental take resulting from conservation measures benefitting the LPS and from covered, non-conservation activities as described in, and in accordance with, the Permit, this CCAA and the CMAs. The Permit will be issued at the time the CCAA is signed, but it will have a delayed effective date, which would be the date on which the Service listed the LPS is listed, if such occurs.

The Service provides the LDWF and Enrollees, through COIs from LDWF, regulatory assurances found at 50 C.F.R. §§17.22(d)(5) and 17.32(d)(5). Consistent with the Service's CCAA Final Policy (64 FR 32726), additional conservation measures, measures to minimize take, land, water, or resource-use restrictions that are in addition to the measures and restrictions described in this CCAA and an Enrollee's CMA will not be imposed with respect to the Enrolled Property should the LPS become listed under the ESA in the future. In the event of unforeseen circumstances, the Service will not require the commitment of additional land, water, or other natural resources beyond the level agreed to in this CCAA and in any CMAs.

**12.1. Changed Circumstances**

"Changed circumstances" are those changes in circumstances that can reasonably be anticipated and planned for in the CCAA. See also 50 C.F.R. § 17.3.

(1) Changed circumstances provided for in a CMA. CMAs will address the following changed circumstances and will include the following statements to address these changed circumstances;

a) Catastrophic Wildfire: Describe emergency salvage harvest and replanting proposal. Larger-scale than normal planting schedule may be necessary to restore adequate habitat conditions for the LPS.

b) Southern pine beetle (*Dendroctonus frontalis*) or Other Insect Infestation: Describe emergency salvage harvest and replanting proposal. Larger-scale than normal planting schedule may be necessary to restore adequate habitat conditions for the LPS.

c) Hurricanes and/or Tornados: Describe emergency salvage harvest and replanting proposal. Larger-scale than normal planting schedule may be necessary to restore adequate habitat conditions for the LPS.

d) Absence or Extirpation of the LPS: With the approval of the Enrollee, the Parties and/or their agents may access the Enrolled Property to restore the LPS by releasing snakes onto the property, if in the judgment of the LDWF and the Service, 1) the species is absent or has become extirpated on the Enrolled Property; 2) the LPS captive breeding program is producing enough snakes to support robust reintroduction; , 3) suitable habitat for the species is occurs on the property; and, 4) it is deemed necessary and beneficial.

e) Discovery of an LPS nest on Enrolled Property: This event is likely to be extremely rare given that no LPS nests have ever been discovered. In the event of such occurrence, the Enrollee and/or the Parties will mark the nest location and place a boundary around the nest (possibly less than 50 feet in diameter). Thereafter, no activity would be allowed to occur within the boundary area until the end of the nesting season.

(2) Changed circumstances not provided for in the CMA. If a CMA is being properly implemented and additional conservation measures not provided in the CMA are necessary to respond to changed circumstances, the LDWF and the Service will not require any conservation measures in addition to those already provided in the CMA without the consent of the Enrollee.

**12.2. Unforeseen Circumstances**

"Unforeseen circumstances" are those circumstances affecting the LPS that could not have been reasonably anticipated by the LDWF and the Service when the CCAA and a CMA were signed, and that result in a substantial and adverse change in the status of the LPS. See also 50 C.F.R. § 17.3.

If additional conservation measures are necessary to respond to unforeseen circumstances, the Service may require that an Enrollee perform such measures where the CMA is being properly implemented only if such measures are limited to modifications within the CCAA's

conservation strategy for the LPS and those measures maintain the original terms of the CCAA to the maximum extent possible. The Service may not require, without the consent of an Enrollee, additional conservation measures that involve the commitment of additional land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources available for development or use under the original terms of the CMA. The Service may notify the LDWF of the need for additional conservation measures in the CCAA. The additional measures shall become part of the CCAA upon the written agreement of the Service and LDWF. Only CMAs entered into after such a modification of the CCAA would be subject to the new terms; however, an existing Enrollee may voluntarily consent to implement such measures.

The Service will have the burden of demonstrating that an unforeseen circumstance exists by using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the LPS. The Service will consider, but not be limited to, the following factors:

1. Size of the current range of the LPS;
2. Percentage of range adversely affected by the CCAA;
3. Percentage of range conserved by the CCAA;
4. Ecological significance of that portion of the range affected by the CCAA;
5. Level of knowledge about the LPS and the degree of specificity of the species' conservation program under the CCAA; and
6. Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the LPS in the wild.

# 13. MONITORING AND REPORTING

## 13.1 Monitoring

Following notification to an Enrollee, the LDWF, Service, and/or their respective agents may access an Enrolled Property to conduct compliance and biological monitoring. Specific monitoring protocols will be developed and described in each CMA. Enrollees will help improve the assessment of the LPS's population status and range by allowing access to survey (traditional trapping, camera traps, LPS scent-detection dogs, or other survey methods when available) the Enrolled Properties across the historical range of the species, facilitated by the LRSF Model. On each property, monitoring will be conducted to provide data on the presence/absence or density of the LPS and pocket gopher, the status of any implemented conservation measures, and/or current habitat condition and amount. The Parties will share data, and the LDWF will provide updated data to the Service by December 1st of each survey year. Biological monitoring methodology will be determined by available funding and potential new survey methodology. In the event that the LPS is listed under the ESA, the LDWF shall, on an annual basis, monitor the amount of take occurring on each Enrolled Property.

### 13.2. Reporting

Monitoring and compliance will be tracked by parcel or other reasonable unit as agreed upon by the Enrollee and the LDWF. The LDWF will maintain a database that will provide a precise measure of the total beneficial effect of habitat enhancement resulting from the CCAA and CMAs. The database will include all Enrolled Properties and will be updated annually to track biological and compliance data for the properties. At a minimum, the database will include the following data fields but should follow those described as "reporting metrics" in Appendix B: 1) the date/type of last biological survey (herbaceous vegetation cover, pocket gopher, or LPS surveys); 2) the number of LPS observed to have been taken; 3) a description of unforeseen or changed circumstances; 4) present/absent/unknown status of the LPS in preceding year; 5) last known compliance status; 6) number of acres being managed for the LPS; 7) extent of acres of habitat managed (by type of management) for the LPS in the preceding year: 8) most recent last estimate of habitat condition; and, 9) last estimate of suitable habitat extent. The LDWF agrees to provide the Service access to the database and annual updates by December 1st. Annual updates will include a data summary table for the fields agreed upon by the Parties.

The LDWF will be responsible for the coordination of the conservation activities and monitoring of the conservation actions and commitments of the Enrollees to determine whether all actions are in accordance with the CCAA and CMAs. The LDWF will develop an annual assessment report of the Enrollees' progress towards implementing the conservation actions described in this CCAA and the respective CMAs. The Parties will meet annually to review the progress.

## 14. RESPONSIBILITIES

### 14.1. Enrollee

An Enrollee will agree to implement management measures beneficial to the conservation of the LPS as set forth herein and as specified in their CMA. Upon execution of the CMA by a Party and the Enrollee, the Party shall issue a COI to the Enrollee. The Enrollee must agree to develop and follow an implementation time schedule and to document progress over the time specified in the CMA. An Enrollee also shall agree to monitor and report at least annually to the LDWF on the status of management measures performed on the Enrolled Property and allow the LDWF to access the property to conduct compliance monitoring.

### 14.2. LDWF

The LDWF agrees to encourage and assist private property owners in Louisiana (a) to become Enrollees under this CCAA and (b) to implement management measures on their respective properties beneficial to the conservation of the LPS. LDWF agrees to enter into CMAs with property owners who choose to become Enrollees, to monitor and report to the Service on the status of such CMAs, and to assist the Service in implementing and administering this CCAA.

LDWF agrees to develop CMAs in accordance with this CCAA.

Prior to entering into a CMA and issuing a COI, the LDWF agrees to confer with the Service in the development of the CMA and COI and to make a good faith effort to resolve any differences with the Service prior to entering into such CMA and issuing the associated COI. The CMA shall be deemed issued only after it has been signed and dated by the Service.

LDWF agrees to work with the Service to address changed and unforeseen circumstances and to implement any conservation measures that the LDWF agrees to undertake in any CMA.

LDWF agrees to comply with the monitoring and reporting requirements of this CCAA, as specified in Section 13 above, and to maintain a statewide database of the Enrolled Properties and the conservation management occurring on the respective properties.

LDWF will confer/consult with the Service and timely suspend or revoke the COI of any Enrollee that fails to act in accordance with the terms of their CMA.

For lands owned by or under the control of the LDWF on which LDWF intends to voluntarily implement conservations measures for the LPS and for which the LDWF will take LPS, LDWF agrees to develop a property-specific agreement that contains the same information as required herein for CMAs. LDWF agrees to confer with the Service in the development of any property-specific agreement and to comply with the monitoring and reporting requirements specified in section 13 above.

### 14.3. Fish and Wildlife Service

The Service agrees to issue a section 10(a)(1)(A) of the ESA Permit to the LDWF in accordance with 50 C.F.R. §§ 17.22(d) and 17.32(d) and the Service's CCAA Policy.

The Service will provide technical assistance to LDWF during the development of CMAs and COIs and make a good faith effort to resolve any differences with LDWF prior to its entering into a CMA or issuing a COI. The CMA shall be deemed issued only after it has been signed and dated by the Service.

The Service agrees to work with LDWF to address changed and unforeseen circumstances.

The Service agrees to review the status of the LPS during the 99-year term of this CCAA. If persistence of the species has been achieved as measured by the goals outlined in section 5.2, above, the Service may, with consent of the LDWF, terminate this CCAA and its associated COIs and CMAs. For example, if the LPS becomes recovered or extinct (and removed from either the Candidate list or list of threatened and endangered wildlife, as appropriate), this CCAA and its associated CMAs and COIs may be terminated.

## 15. NOTIFICATION OF TAKE

No requirement is made in this CCAA for Participants to notify LDWF or the Service prior to any expected incidental take of individual LPSs. For purposes of this CCAA, the Service does not believe that such a notification requirement is practicable or appropriate because it is difficult to detect and/or anticipate when individual LPSs will be incidentally taken and because the best available science indicates that trapping and removing individual LPSs from an area where habitat management would occur is not practical.

## 16. DURATION OF CCAA AND PERMIT

Long-term protection and management, as outlined in this CCAA, are needed for continued conservation of the LPS. The term of this CCAA is 99 years from the date of the last signature in Section 28, below. The section 10(a)(1)(A) Permit authorizing take of the LPS will become effective on the date of any final rule listing the LPS as a "threatened" or "endangered" species under the ESA and will expire when this CCAA expires or is otherwise suspended or terminated. The duration of the Permit and CCAA may be extended prior to the date of permit expiration using the Service's permit renewal process. CMAs and COIs may not extend past the expiration date of the CCAA and Permit. Each Enrollee must agree to maintain and manage suitable habitat for the LPS in accordance with the terms of their CMA for a period of at least 30 years from the date on which the CMA is executed by both parties. An Enrollee may terminate its CMA prior to expiration, and all terms of the agreement (including authorization of incidental take) would become null and void.

## 17. MODIFICATION OF THE CCAA AND CMAS

Either Party may propose modifications to this CCAA by providing written notice to, and obtaining the written concurrence of, the other Party. Such notice shall include a statement of the proposed modification, the reason for it, and its expected results. Modifications may include an expansion of the Covered Area. The Parties will use their best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon completion of any required environmental and other analyses and the other Party's written concurrence. Similarly, either Party or an Enrollee may propose to modify a CMA. Notice to modify a CMA must be in writing and will become effective upon the written concurrence of the Parties and the Enrollee.

## 18. AMENDMENT OF THE PERMIT

Subject to section 12.1 above, the Permit may be amended to accommodate changed circumstances in accordance with all applicable legal requirements, including but not limited to, the ESA, the NEPA, and the Service's permit regulations at 50 C.F.R. Parts 13 and 17. The Party proposing the amendment shall provide a statement describing the proposed amendment and the reasons for it.

# 19. TERMINATION OF AGREEMENTS

## 19.1. Termination of a CMA by an Enrollee

As provided for in Part 8 of the Service's CCAA Policy (64 FR 32726, June 17, 1999), an Enrollee may terminate implementation of the voluntary management actions prior to the expiration date of the CMA, even if the expected benefits of the actions have not been realized. If an Enrollee terminates a CMA, the associated COI is terminated at the same time, thus rescinding the Enrollee's take authorization (if LPS has become listed) as well as the Permit assurances. The Enrollee is required to give 60 days' written notice to the LDWF of its intent to terminate a CMA and to give the LDWF, the Service, and/or their agents the opportunity to enter upon the Enrolled Property to capture and relocate LPSs within 60 days of the notice.

## 19.2. Termination of a CMA by the Parties

Either Party may cancel a CMA and the associated COI where the Enrollee or his/her successor(s) is found to be in non-compliance with the terms and conditions of the CMA. If an Enrollee is non-compliant, the LDWF or the Service may issue a written letter of non-compliance to the Enrollee. The Enrollee shall have 60 days from receipt of the letter to rectify the non-compliance issue(s). If the issue(s) is not resolved to the satisfaction of the Parties by the end of the 60-day period, the CMA and COI shall be declared null and void by either or both Parties. At that point, the CMA and associated COI shall cease to be in effect.

## 19.3. Termination of the CCAA by the LDWF

The LDWF may terminate this CCAA prior to its expiration date by giving at least 90 days prior written notice to the Service and to all Enrollees. During this notice period, the LDWF will make good faith efforts to pursue all appropriate options with the Service to either:

a. locate a suitable transferee to assume the rights and responsibilities of the LDWF under this CCAA and the Permit pursuant to 50 C.F.R. §§13.24(c) and 13.25(c); or
b. assist all Enrollees who desire to do so to obtain individual permits pursuant to 50 C.F.R. Part 13 and §§17.22(b), 17.32(b), 17.22(d), or 17.32(d), as appropriate.

In the event that the Parties are unable to locate a suitable transferee within the 90-day notice period, or within any extension of time to which the Parties may agree in writing, upon termination of this CCAA, the LDWF will surrender the Permit to the Service for cancellation pursuant to 50 C.F.R. §13.26.

# 20. SUSPENSION OR REVOCATION OF A CMA BY LDWF

LDWF hereby commits to monitor, confer with the Service, and timely suspend or revoke the COI of any Enrollee that does not carry out the terms of their respective CMA.

## 21. PERMIT SUSPENSION OR REVOCATION BY THE SERVICE

The Service may suspend or revoke LDWF's Permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation (see 50 C.F.R. §13.28(a)). The Service will give LDWF notice of its intention to suspend or revoke the Permit and an opportunity for LDWF to terminate its CMAs and COIs. The Service may, as a last resort, revoke the Permit if continuation of the permitted activities would likely jeopardize the continued existence of the LPS (50 C.F.R. §§ 17.22(d)(7) and17.32(d)(7)). The Service will revoke the Permit on the ground of jeopardy to the LPS only after first implementing all practicable measures to remedy the situation.

## 22. REMEDIES

Each Party shall have all remedies otherwise available to enforce the terms of the CCAA and the Permit. No Party shall be liable for damages for any breach of this CCAA, any performance or failure to perform an obligation under this CCAA, or any other cause of action arising from this CCAA.

## 23. DISPUTE RESOLUTION

The Parties agree to work together in good faith to resolve their disputes as well as any disputes between LDWF and an Enrollee using dispute resolution procedures agreed upon by both Parties.

## 24. SUCCESSION AND TRANSFER OF CMAS

CMAs entered into pursuant to this CCAA shall be binding on and shall inure to the benefit of the Enrollees and their participating successors and transferees (i.e., new owners) in accordance with applicable regulations (50 C.F.R. §§13.24 and 13.25). The rights and obligations under a CMA and COI may be transferred with the ownership of the Enrolled Property and are transferable to subsequent non-Federal property owners pursuant to 50 C.F.R. §13.25. If a COI is transferred, the new owner(s) will have the same rights and obligations with respect to the Enrolled Property as the original owner. The new owner(s) also will have the option of receiving CCAA assurances by signing a new CMA rather than assuming the existing one. Each CMA shall require the Enrollee to notify LDWF in writing of any transfer of ownership so that LDWF can attempt to contact the new owner, explain the conservation measures applicable to the Enrolled Property and the assurances and seek to interest the new owner in signing the existing CMA or entering into a new one. Assignment or transfer of the COI shall be governed by Service's regulations in force at the time.

## 25. AVAILABILITY OF FUNDS

Implementation of this CCAA is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this CCAA will be construed by the Parties to require the obligation, appropriation, or expenditure of any funds from the U.S. Treasury. The Parties acknowledge that the Service will not be required under this CCAA to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to

commit to such expenditures as evidenced in writing. Nothing in this CCAA will be construed by the Parties to require the obligation, appropriation, or expenditure of any funds by LDWF, or to obligate LDWF to enter a CMA or issue a COI to any landowner.

## 26. NO THIRD-PARTY BENEFICIARIES

This CCAA does not create any new right or interest in any member of the public as a third-party beneficiary nor shall it authorize anyone to maintain any suit, including without limitation, for personal injuries or damages.

## 27. NOTICES AND REPORTS

Any notices and reports, including monitoring and annual reports, required by this CCAA shall be delivered to the persons listed below, as appropriate:

David Castellanos
Agreement Coordinator
Louisiana Pinesnake Candidate Conservation Agreement with Assurances
U.S. Fish and Wildlife Service
Louisiana Ecological Services Office
646 Cajundome Blvd., Suite 400
Lafayette, LA 70506

Carey Lynn Perry
Program Manager
Louisiana Pinesnake Candidate Conservation Agreement with Assurances
Louisiana Department of Wildlife and Fisheries
Natural Heritage Program
P.O. Box 98000
Baton Rouge, LA 70898-9000

## 28. SEVERABILITY

This CCAA shall be implemented in conformance with all applicable laws and regulations of the United States and with all consistent laws and regulations of the State of Louisiana. If any provision of this Agreement is held unlawful, it may be severed and the remaining provisions will continue in force, consistent with the overall purpose to improve the conservation status of the LPS.

## 29. ENTIRE AGREEMENT

This Agreement constitutes the entire agreement between the Parties, and no modification shall be effective unless it is in writing and signed by the authorized representatives of both Parties.

## 30. SIGNATURES

**IN WITNESS WHEREOF, THE PARTIES HERETO** have executed this CCAA to be in effect as of the date last signed below.

**Jack Montoucet, Secretary**
Louisiana Department of Wildlife and Fisheries

12/12/17
DATE

**Mike Oetker, Acting Regional Director**
Southeast Region, Fish and Wildlife Service

2/2/18
DATE

# Appendix A: STRESSOR/ACTION/CONSERVATION MEASURE/REPORTING MATRIX

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| **A. Present or threatened destruction, modification, or curtailment of the species habitat or range** - Expected stressors that may reduce the absolute quantity of habitat, arrangement of habitat, the connectivity of habitat units, the quality of habitat, etc. | | | | |
| A.1. Degradation of habitat through fire suppression or inadequate prescribed fire program; Midstory shading of herbaceous vegetation; preventing or reducing growth. | Initiate/maintain application of frequent fire to generate, maintain, and improve herbaceous understory; less preferable alternative: herbicide treatment to reduce woody midstory vegetation. | Preferred LPS habitat restored to desirable herbaceous understory condition; Restoration and continuation of preferred prescribed fire regimes. | Application and continuation of a prescribed fire program, burning on a 2-3 occurrence per 5-year rotation on enrolled land that contain soils preferable to LPS. Application and continuation of approved herbicide treatment program. | Direct metric: amount and locality of enrolled land prescribed burned 2-3 occurrences over a 5-year rotation period (initially reported annually as area prescribed burned). Indirect metric: amount and locality of enrolled land with adequate herbaceous understory and pocket gophers present. |
| | | | On enrolled land that contains a dense extensive midstory, reduction of excessive midstory fuels through herbicide or mechanical treatment may be necessary prior to initiation of a prescribed fire program while reducing the risk of a catastrophic fire event. Treatment will target woody vegetation and minimize impact to ground cover to the degree practicable. | Direct metric: amount and locality of enrolled land that has been treated with herbicide or mechanical means to reduce midstory fuels. Indirect metric: amount and locality of enrolled land with adequate herbaceous understory and pocket gophers present. |
| | Removal of merchantable midstory locally non-native pine trees and overstory hardwoods present in the stand due to fire exclusion. | Preferred LPS habitat restored to desirable herbaceous understory condition by providing sufficient light penetration to the forest floor. | Select harvest of merchantable midstory locally non-native pine trees and residual overstory of no more that 30% hardwoods when practicable. | Direct metric: amount and locality of enrolled land where merchantable midstory locally non-native pine trees and overstory hardwoods greater than 30% have been removed. Indirect metric: amount and locality of enrolled land with adequate herbaceous understory and pocket gophers present |
| A.2. Loss of habitat through historic or current forest management practices that result in a dense canopy and limited | Thinning overstocked areas, remove excess midstory, and initiate and maintain herbaceous understory conditions. | Preferred LPS habitat restored to desirable herbaceous understory condition by providing sufficient light penetration to the forest floor. Reseeding may be required. | Use individual tree and/or group selection to achieve a well-spaced canopy that will provide the fine fuels necessary for carrying prescribed fire through the stand while allowing sufficient light to penetrate to the forest floor. | Direct metric: amount and locality of enrolled land thinned within a 5 year period (reported annually until the fifth year). Indirect metric: amount and locality of enrolled land with suitable stocking, adequate herbaceous understory, and pocket gophers present. |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| herbaceous understory, not resulting from fire exclusion alone. | Gradual replacement of locally non-native pine species with longleaf pine through group selection, generating an uneven-aged stand. | Preferred LPS habitat restored to desirable herbaceous understory condition by providing sufficient light penetration to the forest floor with native pine species and immediate management through a prescribed fire program. | Use individual tree and/or group selection to create open areas in the stand to be planted with longleaf pine at a density of 400-600 per acre. Prescribed fire can be used as a management tool on these stands. | Direct metric: amount and locality of stands of enrolled land being converted to uneven-aged longleaf pine stands after group-selection harvest at a spacing and density that allows sufficient light penetration and the use of prescribed fire to produce a suitable herbaceous understory.<br>Indirect metric: amount and locality of enrolled land with suitable stocking of uneven-aged longleaf pine, adequate herbaceous understory, and pocket gophers present. |
| | Replanting clearcut harvested areas in a manner that allows generation and maintenance of a suitable herbaceous understory. | Maximize the quantity, quality, and amount of time that herbaceous groundcover can persist before canopy closure. | After clearcuts, replant locally non-native pine species at a spacing and density that allows light penetration for the maximum amount of the harvest rotation as possible. | Direct metric: amount and locality of enrolled land replanted after clearcut harvest at a spacing and density that allows sufficient light penetration to produce a suitable herbaceous understory.<br>Indirect metric: amount and locality of enrolled land with suitable stocking, adequate herbaceous understory, and pocket gophers present. |
| | | | After clearcuts, replant longleaf pine trees at a spacing and density that allows light penetration for the maximum amount of the harvest rotation as possible and which allows for initiation of a prescribed fire program soon after planting. | Direct metric: amount and locality of enrolled land replanted in longleaf pine after clearcut harvest at a spacing and density that allows sufficient light penetration and the use of prescribed fire to produce a suitable herbaceous understory.<br>Indirect metric: amount and locality of enrolled land with suitable stocking of longleaf pine, adequate herbaceous understory, and pocket gophers present. |
| | Reduce mechanical entry and eliminate the use of bedding or tilling of preferable soils. | Reduce or eliminate damage to soil profile and rootstock of herbaceous vegetation, and crushing or destroying pocket gopher burrow complexes. | Enter stands to conduct management with equipment the least amount practicable to achieve the desired herbaceous groundcover conditions. Use longest stand rotations practicable. No use of tilling or bedding on preferable soils. | Amount and locality of enrolled land managed by the use of heavy equipment annually. |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| | | | Use natural regeneration in longleaf stands to prevent the need to plant using mechanical equipment. | Direct metric: amount and locality of enrolled land in longleaf pine proposed to be regenerated naturally after harvest at a density that allows sufficient light penetration and the use of prescribed fire to produce a suitable herbaceous understory.<br>Indirect metric: amount and locality of enrolled land with suitable stocking of longleaf pine, adequate herbaceous understory, and pocket gophers present. |
| A.3. Loss of habitat resulting from conversion of land use from preferable habitat to unsuitable habitat. | Encourage LPS compatible land use and habitat restoration; Avoid conversion of preferable LPS habitat to incompatible land-uses. | Prevention of conversion of areas of suitable herbaceous groundcover on preferable soils to unsuitable habitat and conversion of areas of unsuitable herbaceous groundcover on preferable soils to suitable. | Minimize the amount of enrolled land, particularly on preferable soils, that would be converted to non-compatible land uses such as small structure building when under the control of the Enrollee. Maximum effort will be made to avoid adverse impacts to areas of known occupied habitat or preferable habitat and known capture occurrences. | Direct metric: area and locality of enrolled land being managed for suitable herbaceous groundcover on preferable soils converted to unsuitable land-use (including all land-use conversions). Indirect metric: area and locality with adequate herbaceous understory and pocket gophers present. |
| | | | Using Conservation Measures above, maximize the amount of enrolled land, particularly on preferable soils, that would be converted to compatible land uses when under the control of the Enrollee. Maximum effort will be made in areas of known occupied habitat or preferable habitat and known capture occurrences. | Direct metric: area and locality of enrolled land of previously unsuitable groundcover conditions on preferable soils converted to suitable.<br>Indirect metric: area and locality of enrolled land with adequate herbaceous understory and pocket gophers present. |
| A.4. Landscape scale habitat fragmentation from incompatible land-use creating isolated populations. | Encourage LPS compatible land-use and habitat restoration to develop connectivity among isolated populations. | Isolated populations connected and enlarged by enrolled land with potential LPS habitat restored to suitable canopy, midstory, and understory conditions. | Maximize area of enrolled land in this CCAA, prioritized towards linking isolated occupied habitat areas, to reduce population isolation. Maximize the use of prescribed fire regimes, forest management, and harvest regimes in accordance with Conservation Measures above. | Direct metric: area and locality of enrolled land being managed and/or restored as potential LPS habitat (suitable canopy, midstory and understory conditions) between isolated populations (known occupied habitat).<br>Indirect metric: number and locality of populations connected by suitable habitat. |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| A.5. Habitat fragmentation within a population creating isolated population segments | Encourage LPS compatible land-use and habitat restoration to reduce isolation of population segments. | Isolated population segments connected by areas of preferable LPS habitat restored to suitable canopy, midstory, and understory conditions. | Maximize area of enrolled land in this CCAA, prioritized towards linking isolated suitable habitat, to reduce isolation of population segments. Maximize the use of prescribed fire regimes, forest management, and harvest regimes on enrolled lands to connect isolated population segments in accordance with Conservation Measures above. | Direct metric: area and locality of enrolled land being managed or restored as potential LPS habitat (suitable canopy, midstory and understory conditions) between isolated population segments (known occupied habitat) or suitable habitat patches.<br>Indirect metric: number and locality of population segments connected by suitable habitat. |
| | | | Stand-level harvest rotation and age-structure will be scheduled to achieve a spatial pattern, extent of harvest, and availability of remaining suitable habitat which is unlikely to compromise the persistence of LPS across the managed tract. | Direct metric: Percent and locality of enrolled land being managed or restored as potential LPS habitat that is in a portion of the rotation that would not provide suitable habitat conditions (suitable canopy, midstory and understory conditions).<br>Indirect metric: area and locality of enrolled land with adequate herbaceous understory and pocket gophers present. |
| **B. Over utilization for commercial, recreational, scientific, or educational purposes** - Expected stressors that result in directed take for commercial, recreational, scientific and educational purposes. Also list all incidental take due to commercial, recreational, scientific, or educational activities. | | | | |
| B.1. Collection for pet trade. | Prohibit collection of LPS and provide adequate enforcement of prohibition. | Prevention of illegal collection activities. | Training provided to land managers, conservation measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, and restrictions against and ramifications of harm including the protection and prohibition of LPS take (unpermitted killing or removal from the wild). | Number of people who have access to the property that have been trained regarding LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take (unpermitted killing or removal from the wild). |
| **C. Disease or predation** - Diseases and predators that are suspected of decreasing population viability. | | | | |
| C.1. Direct human predation (killing snakes not associated | Conduct public education to encourage people to avoid harassing or killing snakes | Land user education program developed, implemented and maintained that will reduce or | Training provided to land managers, conservation measure monitoring crews, prescribed fire and/or herbicide or | Number of people who have access to the property that have been trained regarding LPS conservation, conservation measures being |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| with collection for commercial purposes). | | eliminate LPS take. | mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take (unpermitted killing or removal from the wild). | performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take (unpermitted killing or removal from the wild). |
| **D. Inadequacy of existing regulatory mechanisms** - Is funding for implementation and enforcement of existing mechanisms adequate? | | | | |
| D.1. In Louisiana, unpermitted killing or removal from the wild is prohibited. Status of funding and success of implementation or enforcement of existing regulations is unknown. | Implementation and enforcement of existing regulations. | Implementation and enforcement of existing regulations on enrolled lands. | Training provided to land managers, conservation measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands regarding the protection and prohibition of take (unpermitted killing or removal from the wild). Training will include the need for any land users who witness the take of LPS to report such take. | Number of people who have access to the property that have been trained regarding regulations protecting LPS. Number of LPS observed to be taken by land users. |
| **E. Other natural or manmade factors affecting the species' continued existence** - Stressors that cannot be listed under one of the above categories. | | | | |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| E.1. Loss of valuable genetic resources because of small population size and isolation from other populations. | Focus resources to secure long-term LPS compatible management and habitat restoration for populations with sufficient preferable habitat to meet minimum area required to achieve long-term viability (when determined) and to achieve connectivity between isolated populations. | A sufficient number of populations of sufficient size (when determined) through maintenance or improvement of sufficient amounts of suitable preferable LPS habitat, established to ensure long-term viability of the species. | Forest management through this CCAA is anticipated to improve LPS habitat quality and quantity and increase LPS numbers, reducing but not eliminating, the risk posed by small population size, isolation from other populations, and demographic stochasticity. Through population monitoring on enrolled lands and subsequent cooperative genetic research on LPS potentially captured on enrolled lands, increased information will be generated to assess the effects of small population size and isolation throughout the species' range | Amount and locality of enrolled land that has long-term LPS compatible management plans that are being implemented; amount of enrolled land securing inter-population connections and undergoing restoration; Fraction and locality of minimum required habitat (when determined) in suitable LPS herbaceous vegetation conditions for targeted population sizes. |
| | | LPS re-established through reintroduction into blocks of suitable preferable habitat where extirpated. | Where and when deemed necessary and beneficial, reintroduce captive-bred LPS onto enrolled lands containing large blocks of continuous, suitable (through maintenance or restoration) LPS habitat on preferable soils. | Number, locality, and area of enrolled land undergoing active repatriation. |
| E.2. Loss of demographic viability and increased susceptibility to stochastic environmental factors (e.g., weather events, disease) because of small population size and isolation from other populations. | Focus resources to secure long-term LPS compatible management and habitat restoration for populations with sufficient preferable habitat to meet minimum area required to achieve long-term viability (when determined) and to achieve connectivity between isolated populations | A sufficient number of populations of sufficient size (when determined) through maintenance or improvement of sufficient amounts of suitable preferable LPS habitat. LPS re-established in blocks of sufficient habitat where extirpated. | Forest management through this CCAA is anticipated to improve LPS habitat quantity and quality and increase LPS numbers, reducing but not eliminating, the risk posed by demographic stochasticity. Through population monitoring on enrolled lands and subsequent cooperative genetic research on LPS potentially captured on enrolled lands, increased information will be generated to assess the effects of potential population loss or critical depletion. | Fraction of populations and locality required for long-term species viability that have long-term LPS compatible management plans that are being implemented; Number and locality of populations with inter-population connections secured; Fraction and locality of minimum required preferable habitat in suitable condition for targeted large populations; Number and locality of active repatriation populations. |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| | | LPS re-established through reintroduction into blocks of suitable preferable habitat where extirpated. | Where and when deemed necessary and beneficial, reintroduce captive-bred LPS onto enrolled lands containing large blocks of continuous, suitable (through maintenance or restoration) LPS habitat on preferable soils. | Number, area, and locality of enrolled land undergoing active repatriation. |
| E.3. Potential Increased mortality due to off-road vehicles (ORVs). | Limit recreational off-road vehicle use on enrolled land where possible; minimize equipment entry/disturbance for timber harvest and other forest management to the extent practicable. | Reduce LPS mortality by ORV use and forest management activities to the maximum extent practicable; reduce the amount of preferable soils disturbed by ORVs, timber harvest, and forest management equipment. | Any construction and/or establishment of ORV trails will avoid preferred LPS habitat to the maximum extent possible. Where possible, limit recreational off-road vehicle use on enrolled land to established travel corridors or trails. Include restriction language in access leases. Minimize equipment entry/disturbance for timber harvest and other forest management to the extent practicable by lengthening harvest rotations and limiting the number of pre-clearcut harvests when they are not done to accomplish thinning to benefit the LPS. | Area and locality of enrolled land with ORV restrictions and restrictions included in access leases; Harvest prescriptions that will include length of thinning and harvest rotations and reasons for each proposed entry with off-road equipment. |
| | Conduct land user education to encourage ORV users to avoid hitting snakes and remain on established trails. | Land user education program developed, implemented and maintained that will reduce or eliminate LPS take. | Training provided to land managers, conservation measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take. Training will also include the need to report any observed take and its cause to supervisors, land owners, or LDWF. | Number and locality of LPS mortalities observed and reported. Number of people who have access to the property that have been trained regarding LPS identification and avoidance. LDWF and the Service will be contacted by Enrollees for instructions on carcass disposition. |
| E.4. Increased mortality due to road- | Close/restrict access to selected roads in critical | Roads not required for management/lessee purposes | Road bound traffic on Federal and State Highways, County improved and | Amount and locality of unnecessary roads on enrolled lands identified, closed/restricted. |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| bound traffic. | areas where possible. | identified and closure/restrictions implemented. | unimproved roads are beyond the control of enrollees. Private roads on enrolled lands are typically unimproved and are used by relatively slower moving vehicles which are expected to have a reduced likelihood of causing LPS mortality compared to public roads beyond enrollee control. Restriction of access (locked gates) to the least number of land users of private roads under the control of the enrollee will be maximized. If private roads on enrolled lands are identified that are no longer needed for management or required lessee access, they will be closed. | Amount and locality of areas with open access converted to restricted access. |
| | Conduct public education to encourage drivers to avoid hitting snakes. | Public education program developed, implemented and maintained. | Training provided to land managers, conservation measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take. Training will also include the need to report any observed take and its cause, and any dead-on-road LPS to supervisors, land owners, or LDWF. | Number and locality of LPS mortalities observed and reported. Number of people who have access to the property that have been trained regarding LPS identification, avoidance, and need to report. |
| E.5. Entanglement in Erosion Control Blankets. | Prevent future installation of synthetic-based ECBs, and where required, use wildlife friendly erosion control techniques. | Minimization of the installation of ECBs and associated LPS mortality. | When enrollees have control over surface easement restrictions on their land, easement language for construction activities that would potentially install ECBs (for pipelines, roads, etc.) would be included that excludes all use of synthetic | Number and locality of easement agreements that prohibit synthetic ECB installation and follow LDWF-provided wildlife friendly erosion control techniques. Amount and locality of third party ECB (synthetic and biodegradable) installed annually. |

| Stressor[1] | Action Needed | Expected Conservation Benefit of Conservation Measure Implementation | Conservation Measure | Reporting Metric |
|---|---|---|---|---|
| | | | ECBs and uses wildlife friendly erosion control methods when possible. | |
| | **Notes:** | | | |
| | 1. Stressor - a process or event having a negative impact on the LPS. Stressors are grouped into the five listing/delisting criteria. | | | |

# Appendix B: COVERED ACTIVITIES, TYPES OF TAKE, AND MINIMIZATION MEASURES

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| **A. Present or threatened destruction, modification, or curtailment of the species habitat or range.** | | | | | |
| Initiate/maintain application of frequent fire to generate, maintain, and improve herbaceous understory. | Application and continuation of a prescribed fire program, achieving an average burn return interval of 2-3 years, varying interval from one but no longer than 5 years on enrolled land that contains soils preferable to LPS. | Application of frequent prescribed fire and herbicide treatment | Minimal. | LPS is adapted to frequent fire regimes and uses pocket gopher burrows for refugia from fire. Take may occur if inadequate refugia are available in area burned or if LPS is moving through unsuitable habitat when burned. | None available |
| | | Construction of fire breaks. | Minimal | Injury or death from being cut or flattened by tires/tracks/blade of earth-moving equipment. | Before activity, survey, mark, and where possible avoid areas that contain pocket gopher burrows by using travel corridors. |
| | On enrolled land that contains a dense extensive midstory, reduction of excessive midstory fuels through herbicide or mechanical treatment may be necessary prior to initiation of a prescribed fire program to reduce the risk of a catastrophic fire event. Treatment will target woody vegetation and minimize impact to herbaceous ground cover to the degree practicable. | Herbicide application by aircraft. | Minimal | Indiscriminate herbaceous groundcover reduction, potential temporary pocket gopher reduction | Discussion of alternatives with LDWF before decision on activity |
| | | Herbicide application by Off-road Vehicle (ORV). | Minimal | Vehicle mortality due to worksite access of crews and ORV travel through forest. | Before activity, survey, mark, and where possible avoid areas that contain pocket gopher burrows by using travel corridors. |
| | | Herbicide application by individual plant selection. | Minimal to None | Vehicle caused mortality due to worksite access of crews. | Provide LPS Awareness Training to crews. |
| | | Mechanical treatment | Minimal | Vehicle caused mortality due to | Provide LPS Awareness |

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| | | using power trimmers. (Mowers/bush hog?) | | worksite access of crews. | Training to crews. |
| Removal of merchantable midstory locally non-native pine trees and overstory hardwoods present in the stand due to fire exclusion. | Select harvest of merchantable midstory locally non-native pine trees and residual hardwood overstory exceeding 30% when practicable. | Timber harvest of overstocked mid-story pine and excess hardwood overstory. | Minimal | Vehicle caused mortality due to worksite access by harvest crews, equipment and log transport trucks; vehicle caused mortality due to off-road travel by harvest equipment; log-felling on LPS hiding in refugia. | Before activity, survey, mark, and where possible avoid areas that contain pocket gopher burrows by using travel corridors and buffers. |
| Thinning overstocked pine overstory areas, removal of excess midstory, and initiating and maintaining suitable herbaceous understory conditions. | Use individual tree and/or group selection to achieve a well-spaced canopy that will provide the fine fuels necessary for carrying prescribed fire through the stand while allowing sufficient light to penetrate to the forest floor. | Timber harvest of overstocked overstory and excess mid-story. | Minimal | Vehicle caused mortality due to worksite access by harvest crews, equipment and log transport trucks; vehicle caused mortality due to off-road travel by harvest equipment; log-felling on LPS hiding in refugia. | Before activity, survey, mark, and where possible avoid areas that contain pocket gopher burrows by using travel corridors and buffers. |
| Gradual replacement of locally non-native pine species with longleaf pine through group selection, generating an uneven-aged stand. | Use individual tree and/or group selection to create open areas in the stand to be planted with longleaf pine. Prescribed fire can be used as a management tool on these stands. | Group selection harvest and longleaf pine replanting. Machine planting when necessary. Hand planting is preferred in occupied areas especially near pocket gopher colonies. | Minimal | Vehicle caused mortality due to worksite access by harvest crews, equipment and log transport trucks; vehicle caused mortality due to off-road travel by harvest equipment; log-felling on LPS hiding in refugia. | Before activity, survey, mark, and where possible avoid areas that contain pocket gopher burrows by using travel corridors and buffers. |
| Replanting clearcut harvested areas in a manner that allows generation and maintenance of a suitable herbaceous understory. | After clearcuts, replant locally non-native pine species at a spacing and density that allows light penetration for the maximum amount of the harvest rotation as possible. | Clearcutting and replanting harvested areas with locally non-native pine in a spatial and temporal distribution and planting density that achieves suitable herbaceous understory conditions for the maximum amount of | Minimal | Vehicle caused mortality due to worksite access by harvest crews, equipment and log transport trucks; vehicle caused mortality due to off-road travel by harvest equipment; log-felling on LPS hiding in refugia. | Before activity, survey, mark, and where possible avoid areas that contain pocket gopher burrows by using travel corridors and buffers. If CMA stand rotation plan includes any period during rotation that any stand will be in an unsuitable habitat condition, that time will |

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| | | rotation time. | | | be minimized and an adequate amount of suitable habitat availability must be provided in adjacent stands (as described in the CMA). |
| | After clearcuts, replant longleaf pine trees at a spacing and density that allows light penetration for the maximum amount of the harvest rotation as possible and which allows for initiation of a prescribed fire program soon after planting. | Clearcutting and replanting harvested with longleaf pine in a manner that generates and maintains suitable herbaceous understory conditions mostly through prescribed fire. | Minimal | Vehicle caused mortality due to worksite access by harvest crews, equipment and log transport trucks; vehicle caused mortality due to off-road travel by harvest equipment; log-felling on LPS hiding in refugia. | Before activity, survey, mark, and where possible avoid areas that contain pocket gopher burrows by using travel corridors and buffers. |
| Reduce mechanical entry and eliminate the use of bedding or tilling of preferable soils. Reduce use of machine planting | Enter stands to conduct management with equipment the least amount practicable to achieve the desired herbaceous groundcover conditions. Use longest stand rotations practicable. No use of tilling or bedding on preferable/suitable soils. | Mechanical entry to accomplish management needs. Excludes the use of bedding or tilling of preferable/suitable soils but allows the use of "shearing" if there is no significant subsurface disturbance. | Minimal | Vehicle caused mortality due to worksite access by harvest crews, equipment and log transport trucks; vehicle caused mortality due to off-road travel by harvest equipment; log-felling on LPS hiding in refugia | Activity minimizes take. |
| | Use natural regeneration in longleaf stands to prevent the need to plant using mechanical equipment. | Natural longleaf pine regeneration through prescribed fire management. Supplemental hand planting of longleaf pine. | Minimal | LPS is adapted to frequent fire regimes and use pocket gopher burrows for refugia from fire. Take may occur if inadequate refugia amount is available in area burned but this type of management is expected to increase refugia availability. | Activity minimizes take. |

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| Encourage LPS compatible land use and habitat restoration; Avoid conversion of preferable LPS habitat to incompatible land-uses. | Minimize the amount of enrolled land, particularly on preferable soils, that would be converted to non-compatible land uses such as minor construction when under the control of the Enrollee. Maximum effort will be made to avoid or minimize adverse impacts to areas of known occupied habitat or preferable habitat and known capture occurrences. | Conversion of land use to non-pine forest will be minimized when those activities are under the control of the Enrollee and LDWF will be notified if any such conversions are planned by an Enrollee or other entity. | Minimal | Habitat loss by land use conversion or vehicle caused mortality due to increased traffic by construction and maintenance crews, equipment transport trucks; log-felling or construction site preparation mortality to LPS hiding in refugia during conversion. | Activity minimizes take. |
| | Using Conservation Measures above, maximize the amount of enrolled land, particularly on preferable soils, that would be converted to compatible land uses when under the control of the Enrollee. Maximum effort will be made in areas of known occupied habitat or preferable habitat and known capture occurrences. | Conversion of land with preferable soils from non-suitable land use to restored pine forest when those areas are under the control of the Enrollee. | Very Minimal | Possibly isolated individuals may persist or be travelling through areas of unsuitable habitat during conversion to suitable conditions and may be directly impacted by management activities. | None |
| Encourage LPS compatible land-use and habitat restoration to develop connectivity among isolated populations. | Maximize area of enrolled land in this CCAA, prioritized towards linking isolated occupied habitat areas, to reduce population isolation. Maximize the use of prescribed fire regimes, forest management, and harvest regimes in accordance with Conservation Measures above. | Between isolated suitable or occupied habitat, conversion of land with LPS preferable soils from non-suitable land use or habitat conditions to restored pine forest where those areas are under the control of the Enrollee. | Very Minimal | Possibly isolated individuals may persist or be travelling through areas of unsuitable habitat during conversion to suitable conditions and may be directly impacted by management activities. | None |
| Encourage LPS compatible land-use and habitat restoration to reduce isolation of | Maximize area of enrolled land in this CCAA, prioritized towards linking isolated suitable habitat, to reduce isolation of population | Between isolated suitable or occupied habitat, conversion of land with LPS | Very Minimal | Possibly isolated individuals may persist or be travelling through areas of unsuitable habitat during conversion to suitable conditions | None |

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| population segments. | segments. Maximize the use of prescribed fire regimes, forest management, and harvest regimes on enrolled lands to connect isolated population segments in accordance with Conservation Measures above. | preferable/suitable soils from non-suitable land use or habitat conditions to restored pine forest when those areas are under the control of the Enrollee. | | and may be directly impacted by management activities. | |
| | Stand-level harvest rotation and age-structure will be scheduled to achieve a spatial pattern, extent of harvest, and availability of remaining suitable habitat which is unlikely to compromise the persistence of LPS across the managed tract. | Stand-level harvest rotation plan that assures a spatial pattern, extent of harvest, and availability of remaining suitable habitat that is unlikely to compromise the persistence of LPS across the managed tract | Minimal | Suitable habitat availability reduction if stands rotate through the CMA plan into unsuitable habitat conditions (i.e. canopy closure, fire exclusion during specific period during rotation, etc.). | If CMA stand rotation plan includes any period during rotation that any stand will be in an unsuitable habitat condition, that time will be minimized and an adequate amount of suitable habitat availability must be provided in adjacent stands (as described in the CMA). |
| **B. Over utilization for commercial, recreational, scientific, or educational purposes.** | | | | | |
| Prohibit unauthorized collection of LPS and provide adequate enforcement of prohibition. | LPS Awareness Training provided to land managers, Conservation Measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, and restrictions against and ramifications of harm including the protection and prohibition of LPS take (unpermitted killing or removal from the wild). | Provide staff and stakeholders LPS Awareness Training. | None | None | Activity minimizes take. |

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| **C. Disease or predation.** | | | | | |
| Conduct public education to encourage people to avoid harassing or killing snakes | LPS Awareness Training provided to land managers, Conservation Measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take (unpermitted killing or removal from the wild). | Provide staff and stakeholders LPS Awareness Training. | None | None | Activity minimizes take. |
| **D. Inadequacy of existing regulatory mechanisms.** | | | | | |
| Implementation and enforcement of existing regulations. | LPS Awareness Training provided to land managers, conservation measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands regarding the protection and prohibition of take (unpermitted killing or removal from the wild). Training will include the need for any land users who witness the take of LPS to report such take. | Provide staff and stakeholders LPS Awareness Training. | None | None | Activity minimizes take. |
| **E. Other natural or manmade factors affecting the species' continued existence.** | | | | | |

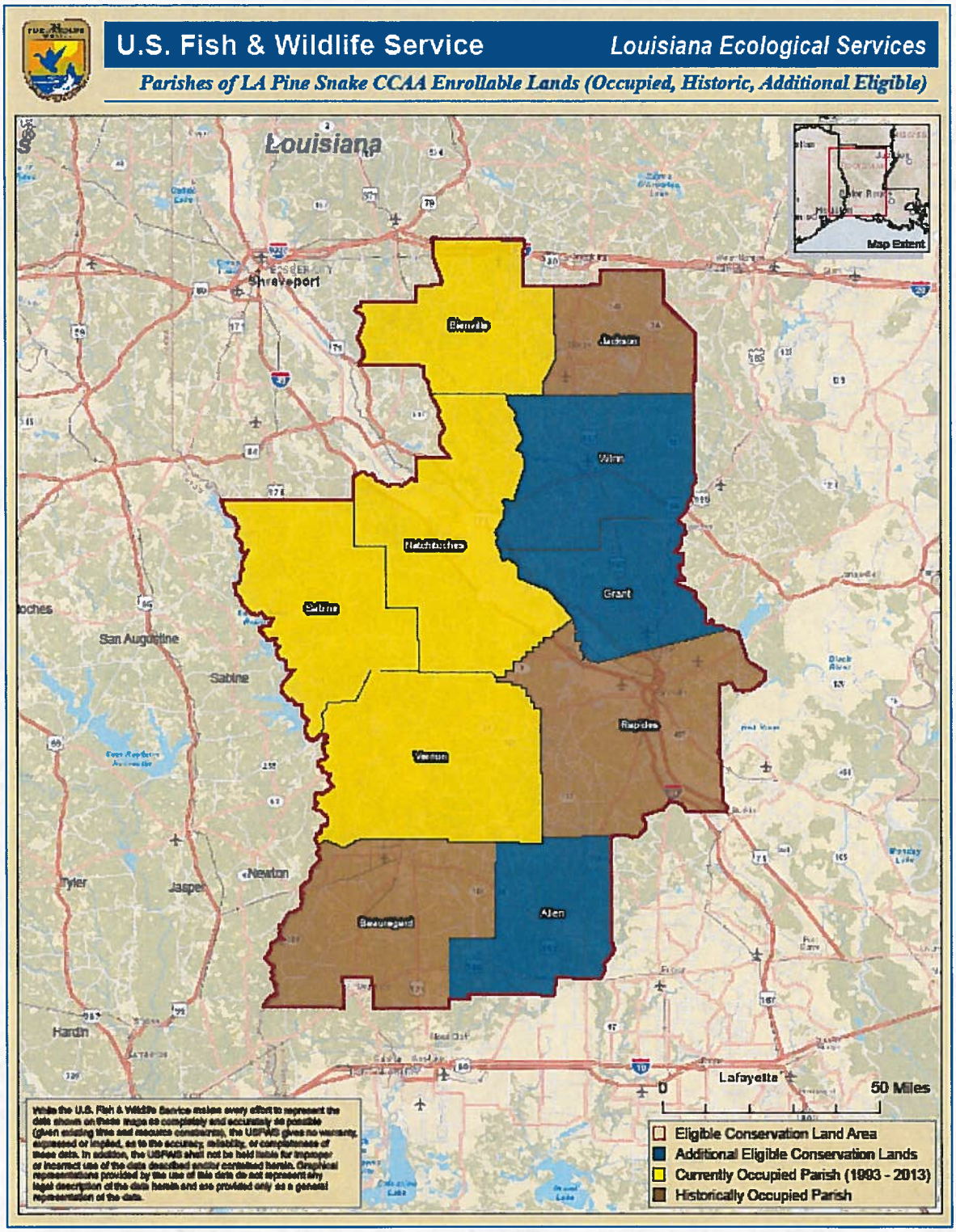
| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| Secure long-term LPS compatible management and habitat restoration through sufficient CCAA enrollment on occupied lands and unoccupied land between them to meet minimum area required to achieve long-term viability (when determined) and to achieve connectivity between isolated populations. | Implementation of this CCAA is anticipated to improve LPS habitat quality and quantity and increase LPS numbers, reducing but not eliminating, the risk posed by small population size, isolation from other populations, and demographic stochasticity. Through population monitoring on enrolled lands and subsequent cooperative genetic research on LPS potentially captured on enrolled lands, increased information will be generated to assess the effects of small population size and isolation throughout the species' range. | LPS conservation measures described above. Monitoring of habitat or pocket gopher response to LPS conservation management.). | Conservation measures: see above. Habitat or gopher monitoring: None. LPS monitoring: very minimal | LPS Monitoring: potential death or injury from trapping or capture and associated biological data collection. | LPS Monitoring: follow established protocols (trap checking frequency, etc.); use scent-detection dogs if available. |
| | Where and when deemed necessary and beneficial, reintroduce captive-bred LPS onto enrolled lands containing large blocks of continuous, suitable (through maintenance or restoration) LPS habitat on preferable soils. | Reintroduction of captive-bred LPS onto restored habitat. | None | None | None, activity is completely beneficial. |

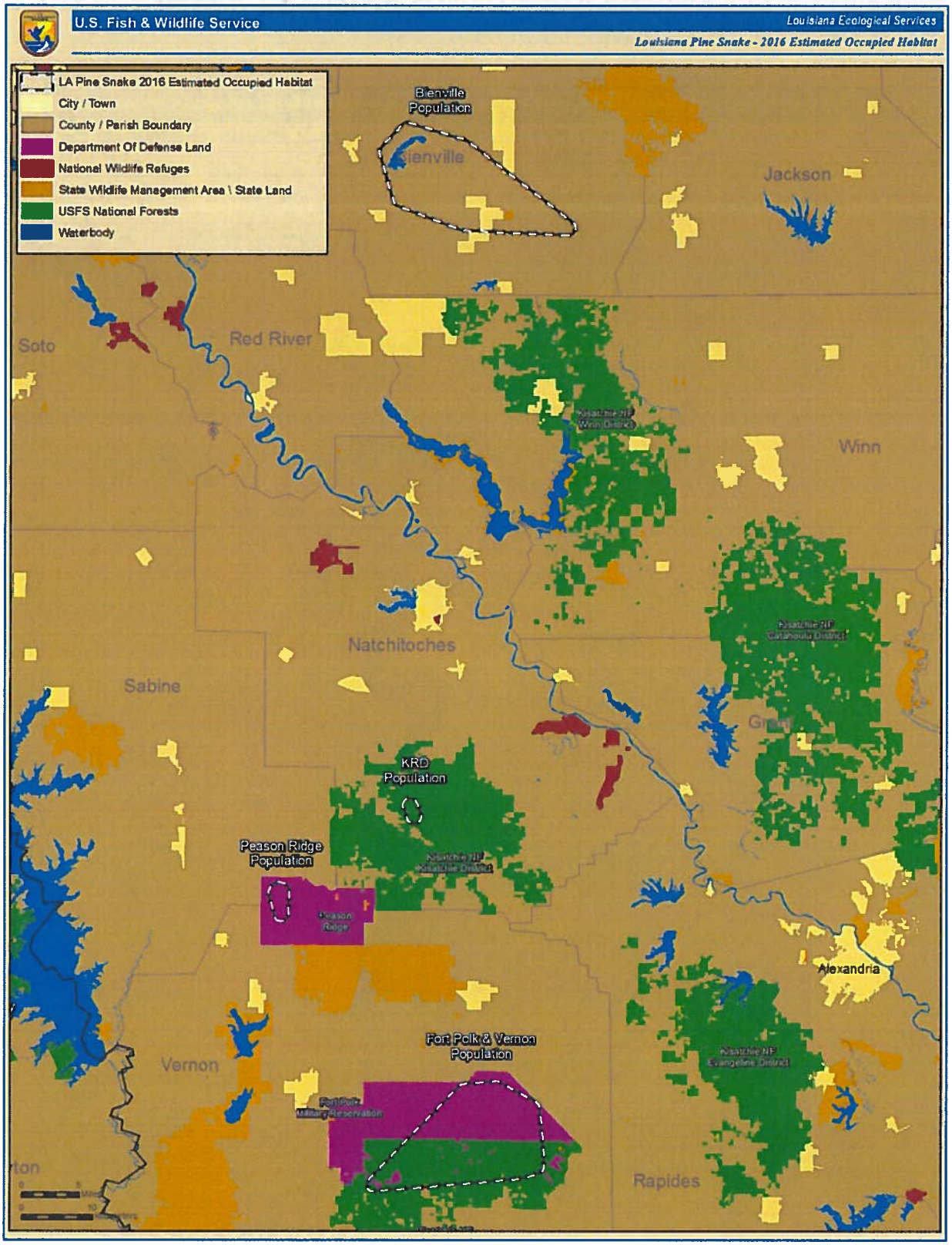
| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| | Implementation of this CCAA is anticipated to improve LPS habitat quantity and quality and increase LPS numbers, reducing but not eliminating, the risk posed by demographic stochasticity. Through population monitoring on enrolled lands and subsequent cooperative genetic research on LPS potentially captured on enrolled lands, increased information will be generated to assess the effects of potential population loss or critical depletion. | LPS conservation measures described above. Monitoring of habitat or pocket gopher response to LPS conservation management. Potential monitoring of LPS by trapping or scent-detection dogs (if available). | Conservation measures: see above. Habitat or gopher monitoring: None. LPS monitoring: very minimal | LPS Monitoring: potential death or injury from trapping or capture and associated biological data collection. | LPS Monitoring: follow established protocols (trap checking frequency, etc.); use scent-detection dogs if available. |
| Limit recreational ORV use on enrolled land where possible; minimize equipment entry/disturbance for timber harvest and other forest management to the extent practicable. | Any construction and/or establishment of ORV trails will avoid preferred LPS habitat to the maximum extent possible. Where possible, limit recreational ORV use on enrolled land to the degree practicable (e.g., limits on ORV weight, tire pressure, speed, time of year use). Minimize equipment entry/disturbance for timber harvest and other forest management to the extent practicable by lengthening harvest rotations, limiting the number of pre-clearcut harvests when they are not done to improve canopy conditions, and have logging crews avoid pocket gopher burrow complexes by travelling on established routes while harvesting. | Construction of ORV trails outside of preferred LPS habitat. Minimal ORV use in preferred LPS habitat by LPS awareness-trained people. Use of off-road timber harvest equipment to facilitate LPS conservation measures above. | General ORV use: Minimal. Timber Harvest: Moderate | ORV and harvest equipment caused mortality due to off-road travel. | Provide LPS awareness training to ORV users and timber harvest operators. Develop stand entry and harvest rotation plans to minimize frequency and duration of entry while still maximizing LPS habitat management goals. |
| Conduct land user LPS | LPS Awareness Training provided | Staff and stakeholder | None | None | Activity minimizes take. |

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| Awareness Training to encourage ORV users to avoid hitting snakes and remain on established trails | to land managers, Conservation Measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take. Training will also include the need to report any observed take and its cause to supervisors, land owners, or LDWF. | training. | | | |
| Close/restrict access to selected roads in critical areas where possible. | Private roads on enrolled lands are typically unimproved and are used by relatively slower moving vehicles which are expected to have a reduced likelihood of causing LPS mortality compared to public roads beyond Enrollee control. Restriction of access (locked gates) to the least number of land users of private roads under the control of the enrollee will be maximized. If private roads on enrolled lands are identified that are no longer needed for management or required lessee access, they will be closed. | Restrict enrolled land access to a minimum number of authorized and LPS awareness-trained people. Close roads that are not necessary. | Minimal | Vehicle caused mortality due to enrolled land access by harvest crews, equipment and log transport trucks and other lessees. | Activity minimizes take. |

| Action Needed | Conservation Measure | Covered Activity | Relative Amount of Potential Take | Type of Take | Minimization Measure |
|---|---|---|---|---|---|
| Conduct LPS Awareness Training to encourage drivers to avoid hitting snakes. | LPS Awareness Training provided to land managers, Conservation Measure monitoring crews, prescribed fire and/or herbicide or mechanical midstory management crews, timber harvesters, tree planters, equipment operators, hunters and other users of enrolled lands. Training will emphasize the importance of LPS conservation, conservation measures being performed on enrolled property, identification, avoidance, and restrictions against and ramifications of harm including the protection and prohibition of LPS take. Training will also include the need to report any observed take and its cause, and any dead-on-road LPS to supervisors, land owners, or LDWF. | Staff and stakeholder training. | None | None | Activity minimizes take. |
| Prevent future installation of synthetic-based ECBs, and where required, use the minimum amount of biodegradable ECBs or use HECPs instead. Have ECBs removed where possible. | When enrollees have control over surface easement agreements on their land, language would be included that recommends HECPs and prohibits all use of synthetic ECBs and minimizes the installation of any ECBs when possible for construction activities (pipelines, roads, etc.) that would potentially install ECBs. | ECB restrictive easement language in surface easement contracts. Removal of existing synthetic ECBs where possible. | None | None | Activity is completely beneficial. |

# Appendix C: LPS ENROLLABLE LANDS AND OCCURRENCE MAPS (PARISHES OF OCCURRENCE, OHMCPs)




U.S. Fish & Wildlife Service
Louisiana Ecological Services
Louisiana Pine Snake - 2016 Estimated Occupied Habitat
LA Pine Snake 2016 Estimated Occupied Habitat
City / Town
County / Parish Boundary
Department Of Defense Land
National Wildlife Refuges
State Wildlife Management Area \ State Land
USFS National Forests
Waterbody
Bienville Population
Bienville
Jackson
Soto
Red River
Winn
Natchitoches
Sabine
KRD Population
Peason Ridge Population
Alexandria
Fort Polk & Vernon Population
Vernon
Rapides

## Appendix D: LITERATURE CITED


Allender M.C., S. Baker S., D. Wylie D., D. Loper., M.J. Dreslik, C.A. Phillips, C. Maddox, and E.A. Driskell. 2015. Development of Snake Fungal Disease after Experimental Challenge with *Ophidiomyces ophiodiicola* in Cottonmouths (*Agkistrodon piscivorous*). PLoS ONE 10(10): e0140193. doi:10.1371/journal.pone.0140193.

Barton, C., and K. Kinkead. 2005. Do erosion control and snakes mesh? Journal of Soil and Water Conservation 60:33A–35A.

Baxley, D. 2007. Spatial ecology, prey dynamics, habitat modeling, resource selection, and phylogenetic assessment of the black pinesnake. A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, University of Southern Mississippi, Hattiesburg, Mississippi. 116 pp.

Beane, J.C. 2014. *Coluber* (= *Masticophis*) *flagellum flagellum* (eastern coachwhip) and Pituophis melanoleucus melanoleucus (northern pinesnake), Diet and predation. Herpetological Review 45(1):142-143.

Bonnet, X., G. Naulleau, and R. Shine. 1999. The dangers of leaving home: dispersal and mortality in snakes. Biological Conservation 89:39-50.

Boundy, J. 2008. Herpetologist, Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. March 13, 2008 email communication with Ben Thatcher, U.S. Fish and Wildlife Service, Lafayette, Louisiana.

Bridges, E.L. and S.L. Orzell. 1989. Longleaf pine communities of the West Gulf coastal Plain. Natural Areas Journal 9:246-253.

Burger, J., R.T. Zappalorti, J. Dowdell, T. Georgiadis, J. Hill, and M. Gochfeld. 1992. Subterranean predation on pine snakes (*Pituophis melanoleucus*). Journal of Herpetology 26:259-263.

Conant, R.T., 1956. A review of two rare pine snakes from the Gulf coastal plain. American Museum Novitates, 1781:1-31.

Conant, R.T. and J.T. Collins. 1991. A field guide to reptiles and amphibians of eastern and central North America. 3rd ed. Houghton Mifflin Co., Boston, MA. 450 pp.

Davis, B.J. 1971. A new size record for the Louisiana pine snake, *Pituophis melanoleucus ruthveni*. Texas Journal of Science 23:145.

Diffie, S., J. Miller, and K. Murray. 2010. Laboratory observations of red imported fire ant (Hymenoptera: Formicidae) predation on reptilian and avian eggs. Journal of Herpetology 44:294–296.

Dodd, C.K., W.J. Barichivich, and L.L. Smith. 2004. Effectiveness of a barrier wall and culverts in reducing wildlife mortality on a heavily traveled highway in Florida. Biological Conservation: 118:619-631.

Duran, C.M. 1998. Radio-telemetric study of the black pine snake (*Pituophis melanoleucus lodingi*) on the Camp Shelby Training site. Report to the Mississippi Natural Heritage Program and the Mississippi National Guard. 44 pp.

Ealy, M.J., R.R. Fleet, and D.C. Rudolph. 2004. Diel activity patterns of the Louisiana pine snake (*Pituophis ruthveni*) in eastern Texas. Texas Journal of Science 56:383-394.

Ernst, C.H. and E.M. Ernst. 2003. Snakes of the United States and Canada. Smithsonian Books, Washington, D.C. pp. 280-284.

Fischer, J.D., S.H. Cleeton, T.P. Lyons, and J.R. Miller. 2012. Urbanization and the predation paradox: the role of trophic dynamics in structuring vertebrate communities. BioScience 62:809-818.

Frost, C.C. 1993. Four centuries of changing landscape patterns in the longleaf pine ecosystem. Pgs. 17-43 *In*: S.M. Hermann (ed.). Proceedings of the Tall Timbers Fire Ecology Conference, No. 18, The longleaf pine ecosystem: ecology, restoration and management. Tall Timbers Research Station, Tallahassee, FL.

Gregory, B. 2008. Zoologist, Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. March 14, 2008, email communication with U.S. Fish and Wildlife Service, Lafayette, Louisiana.

Gregory, B. 2015. Zoologist, Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. Photographs provided to David Castellanos, U.S. Fish and Wildlife Service, Lafayette, Louisiana.

Gregory, B. 2016. Zoologist, Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. June 28, 2016, email communication with David Castellanos, U.S. Fish and Wildlife Service, Lafayette, Louisiana.

Guyer, C. and M.A. Bailey. 1993. Amphibians and reptiles of longleaf pine communities. Pages 17-43 *in* S.M. Hermann, editor. Proceedings of the Tall Timbers Fire Ecology Conference, No. 18, The longleaf pine ecosystem: ecology, restoration and management. Tall Timbers Research Station, Tallahassee, FL.

Himes, J.G. 1998. Activity patterns, habitat selection, excavation behavior, growth rates, and conservation of the Louisiana pine snake (*Pituophis melanoleucus ruthveni*). Masters thesis, Louisiana State University, Shreveport, LA. 58 pp.

Himes, J.G. 2000. Burrowing ecology of the rare and elusive Louisiana pine snake, *Pituophis ruthveni* (Serpentes: Colubridae). Amphibia-Reptilia 22:91-101.

Himes, J.G., L.M. Hardy, D.C. Rudolph, and S.J. Burgdorf. 2002. Growth rates and mortality of the Louisiana pine snake (*Pituophis ruthveni*). Journal of Herpetology 36(4):683-687.

Himes, J.G., L.H. Hardy, D.C. Rudolph, and S.J. Burgdorf. 2006. Movement patterns and habitat selection by native and repatriated Louisiana pine snakes (*Pituophis ruthveni*): Implications for conservation. Herpetological Natural History 9:103-116.

Holcomb, Samuel R., Amity A. Bass, Christopher S. Reid, Michael A. Seymour, Nicole F. Lorenz, Beau B. Gregory, Siarah M. Javed, and Kyle F. Balkum. 2015. Louisiana Wildlife Action Plan. Louisiana Department of Wildlife and Fisheries. Baton Rouge, Louisiana. 572 pp. http://www.wlf.louisiana.gov/wildlife/wildlife-action-plan

Kapfer, J. M., and R. A. Paloski. 2011. On the threat to snakes of mesh deployed for erosion control and wildlife exclusion. Herpetological Conservation and Biology 6(1):1-9.

Kwiatkowski, M.A., D.C. Rudolph, and J.B. Pierce. 2014. Conservation Genetics of Louisiana Pine Snakes, Pituophis ruthveni. Unpublished report to Louisiana Department of Wildlife and Fisheries, Baton Rouge, Louisiana. 29 pp

LDWF. 2010. Louisiana Department of Wildlife and Fisheries five-year strategic plan, fiscal year 2011-2012 through 2015-2016. Baton Rouge, LA. 33pp.

Lorch, J.M, J.S. Lankton, S. Knowles, K. Michell, J.L. Edwards, J.M. Kapfer, R.A.Staffen, E.R. Wild, K.Z. Schmidt, A.E. Ballman, D. Blodgett, T.M. Farrell, B.M. Glorioso, L.A. Last, S.J. Price, K.L. Schuler, C.E. Smith, J.F.X. Wellehan Jr., D.S. Blehert. Snake fungal disease: an emerging threat to wild snakes. Proceedings of the Royal Society of London. Series B-Biological Sciences. In press.

Lorch, J.M., J. Lankton, K. Werner, E.A. Falendysz, K. McCurley, and D.S. Blehert. 2015. Experimental infection of snakes with *Ophidiomyces ophiodiicola* causes pathological changes that typify snake fungal disease. mBio 6(6):e01534-15: doi:10.1128/mBio.01534-15

Outcalt, K.W. and R.M. Sheffield. 1996. The longleaf pine forest: trends and current conditions. Resource Bulletin SRS-9. Asheville, NC. U.S. Department of Agriculture, Forest Service, Southern Research Station. 23 pp.

Pierce, J. 2015. Unpublished Data. USDA Forest Service, Southern Research Station. Nacogdoches, TX.

Reichling, S.B. 1988. Reproduction in captive Louisiana pine snakes, *Pituophis melanoleucus ruthveni*. Herpetological Review 19(4):77-78.

Reichling, S.B. 1990. Reproductive traits of the Louisiana pine snake *Pituophis melanoleucus ruthveni* (Serpentes:Colubridae). Southwestern Naturalist 35(2):221-222.

Reichling, S.B. 1995. The taxonomic status of the Louisiana pine snake (*Pituophis melanoleucus ruthveni*) and its relevance to the evolutionary species concept. Journal of Herpetology 29(2):186-198.

Reichling, S.B. 2008a. Louisiana pine snake species survival plan. Unpublished report submitted to the U.S. Fish and Wildlife Service, Lafayette, LA. 15 pp. + tables and appendices.

Reichling, S.B. 2008b. Curator, Memphis Zoo, Memphis, Tennessee. March 14, 2008, email communication with Ben Thatcher, U.S. Fish and Wildlife Service, Lafayette, Louisiana.

Reichling, S.B., D.C. Rudolph, D. Ferri, and C. Baker. 2008. Relative abundances of snakes in Louisiana industrial forest, with special emphasis on *Pituophis ruthveni*. Unpublished report submitted to the U.S. Fish and Wildlife Service, Lafayette, LA. 11 pp. + tables.

Row, J. R., G. Blouin-Demers, and P. J. Weatherhead. 2007. Demographic effects of road mortality in black ratsnakes (*Elaphe obsoleta*). Biological Conservation 137:117-124.

Rudolph, D.C. 2000. Habitat quality at historical Louisiana pine snake localities. Unpublished report submitted to the U.S. Fish and Wildlife Service, Jackson, MS 11pp + tables and appendices.

Rudolph, D.C. 2008. USDA Forest Service, Southern Research Station, Nacogdoches, TX. March 11, 2008 email communication with Ben Thatcher, U.S. Fish and Wildlife Service, Lafayette, LA.

Rudolph, D.C., and S.J. Burgdorf. 1997. Timber rattlesnakes and Louisiana pine snakes of the west Gulf Coastal Plain: hypotheses of decline. Texas Journal of Science 49:111-122.

Rudolph, D.C., S.J. Burgdorf, J.C. Tull, M. Ealy, R.N. Conner, R.R. Schaefer, and R.R. Fleet. 1998. Avoidance of fire by Louisiana pine snakes, Pituophis melanoleucus ruthveni. Herpetological Review 29: 146-148.

Rudolph, D.C., and R.N. Conner. 1996. Radio-telemetry study of Louisiana pine snakes in eastern Texas and western Louisiana. Unpublished report to Texas Parks and Wildlife and Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. 7 pp.

Rudolph, D.C., S.J. Burgdorf, R.N. Conner, and J.G. Dickson. 1998. The impact of roads on the timber rattlesnake (*Crotalus horridus*) in eastern Texas. Proceedings of the International Conference on Wildlife Ecology and Transportation (Fort Myers, FL). G.L. Evink, P. Garrett, D. Zeigler, and J. Berry (eds.). Florida Department of Transportation, Tallahassee, FL.

Rudolph, D.C., S.J. Burgdorf, R.N. Conner, and R.R. Schaefer. 1999. Preliminary evaluation of the impact of roads and associated vehicular traffic on snake populations in eastern Texas. Proceedings of the Third International Conference on Wildlife Ecology and Transportation

(Missoula, MT). G.L. Evink, P. Garrett, and D. Zeigler (eds.). Florida Department of Transportation, Tallahassee, FL. FL-ER-73-99.

Rudolph, D.C., S.J. Burgdorf, R.N. Conner, C.S. Collins, D. Saenz, R.R. Schaefer, C.M. Duran, M. Ealy, and J.G. Himes. 2002. Prey handling and diet of Louisiana pine snakes (*Pituophis melanoleucus*) and black pine snakes (*P. melanoleucus lodingi*) with comparisons to other selected colubrid snakes. Herpetological Natural History 9:57-62.

Rudolph, D.C., S.J. Burgdorf, and R.R. Schaefer, R.N. Conner, and R.W. Maxey. 2006. Status of *Pituophis ruthveni* (Louisiana pine snake). Southeastern Naturalist 5:463-472.

Rudolph, D.C., C.A. Melder, J.B. Pierce, R.R. Schaefer, and B. Gregory. 2012. Diet of the Louisiana Pine Snake (*Pituophis ruthveni*). Herpetological Review 43:243-245.

Stuart, J.N., M.L. Watson, T.L. Brown, and C. Eustice. 2001. Plastic netting: an entanglement hazard to snakes and other wildlife. Herpetological Review 32:162–164.

Stull, O.G. 1929. The description of a new subspecies of *Pituophis melanoleucus* from Louisiana. Occasional Papers of Museum of Zoology, University of Michigan 205:1-3.

USDA Forest Service. 2002. Forest Service Manual (FSM) 2600 – Fish, wildlife, and sensitive plant habitat management. Accessed 23 April 2008.

U.S. Department of the Army. 2008. JRTC and Fort Polk Regulation 210-18; Installation hunting, trapping, and fishing regulation. July 1, 2008. Headquarters, JRTC and Fort Polk, Fort Polk, LA. 13 pp.

U.S. Department of the Army. 2013. JRTC and Fort Polk Regulation 210-1; Environmental quality; installation performance requirements. February 20, 2013. Headquarters, JRTC and Fort Polk, Fort Polk, LA. 177 pp.

USFWS. 2003. Candidate conservation agreement for the Louisiana pine snake *Pituophis ruthveni* between the USFWS, USFS, Fort Polk (DOD), TPWD, and LDWF. 30pp.

USFWS. 2013. Candidate conservation agreement for the Louisiana pine snake *Pituophis ruthveni* between the USFWS, USFS, Natural Resources Conservation Service, DOD (Fort Polk and the Joint Readiness Training Center), TPWD, LDWF, and Association of Zoos and Aquariums. 71pp.

USFWS. 2014. Species assessment and listing priority assignment form for the Louisiana pine snake *Pituophis ruthveni.* 34 pp.

USFWS and NMFS. 1999. Announcement of final policy for Candidate Conservation Agreements with Assurances. Federal Register: June 17, 1999 (Volume 64, Number 116). Pages 32726-32736.

Vandeventer, T.L. and R.A. Young. 1989. Rarities of the longleaf: the black and Louisiana pine snakes. Vivarium, 1:32-36.

Vandeventer, T. 2016. May 22, 2016, email communication with David Castellanos, U.S. Fish and Wildlife Service, Lafayette, Louisiana.

Wagner, R.O., J.B. Pierce, D.C. Rudolph, R.R. Schaefer and D.A. Hightower. 2014. Modeling Louisiana pine snake (*Pituophis ruthveni*) habitat use in relation to soils. Proceedings of the 5th Big Thicket Science Conference: Changing Landscapes and Changing Climate. Southeastern Naturalist 13 (Special Issue 5): 146-158.

Wood, G. W., and D. N. Roark. 1980. Food habits of feral hogs in coastal South Carolina. Journal of Wildlife Management 44:5–6–511.

Yager, L., J. Lee, M. Hinderliter, and S. Leonard. 2006. 2006 Annual Report. The Nature Conservancy, Camp Shelby Field Office, MS. 50 pp. + appendices.

Young, R.A., and T.L. Vandeventer. 1988. Recent observations of the Louisiana pine snake, *Pituophis melanoleucus ruthveni* Stull. Bulletin of the Chicago Herpetological Society 23(12):203-207.

Zappalorti, R.T. 2016. Do drift fences, in conjunction with funnel box traps, capture secretive terrestrial snakes? Report to New Jersey Division of Fish and Wildlife Endangered and Nongame Species Program. 34 pp.

**Attachment 1**
**Template Conservation Management Agreement (CMA)**
**Candidate Conservation Agreement with Assurances for Louisiana pinesnake**

## 1.0 Introduction

This Conservation Management Agreement ("CMA"), entered into by ***[insert name]*** ("Enrollee") and **Louisiana Department of Wildlife and Fisheries (LDWF)** ("Authorizing Party")(collectively the "Parties"), is intended to promote good land stewardship through the implementation of conservation activities on the Enrollee's property ("Enrolled Property") to preclude or remove the need to list the Louisiana pinesnake under the Endangered Species Act of 1973, as amended, 16 U.S.C. § 1531 *et seq*. ("ESA"). This CMA and the associated Certificate of Inclusion ("Certificate") ***[reference Certificate #XXX attachment to this CMA]*** are entered into and issued, respectively, in accordance with the *Programmatic Candidate Conservation Agreement with Assurances for the Louisiana Pinesnake* ("Agreement") between the U.S. Fish and Wildlife Service ("Service") and LDWF (collectively the "Authorizing Parties") and the associated Enhancement of Survival Permit (Permit).

The Louisiana pinesnake covered by this CMA is listed in Exhibit "A", which is attached hereto and incorporated herein. That also is the only species for which incidental take is authorized under this CMA and the associated Certificate, which is attached hereto as Exhibit "B" and incorporated herein.

CMA Tracking Number: ***[Service Louisiana Ecological Services Field Office will provide.]***

## 2.0 Enrolled Property

The Enrolled Property subject to this CMA is as follows: ***[include legal description]*** in ***[Parish]***, Louisiana. The Enrolled Property, which contains habitat that may be used by Louisiana pinesnakes lies within the Louisiana portion of the historical range of the Louisiana pinesnake and consists of ***[insert # of acres],*** as shown on the property map ***[reference map attached to this CMA]*** attached hereto as Exhibit "C" and incorporated herein. The boundaries of the Enrolled Property and the amount of Covered Species' habitat are reflected on the map.

## 3.0 CCAA Standard and Conservation Goals

### 3.1 CCAA Standard

The Parties reasonably expect this CMA to protect, enhance, and restore upland pine forest habitat, improve land use practices to promote the continued existence and/or reestablishment of viable populations of Louisiana pinesnakes in the portion of the species' range located on the Enrolled Property. For as long as the management activities set forth herein are implemented on the Enrolled Property, the Parties anticipate improvements in habitat quantity and quality for Louisiana pinesnakes will result in a net conservation benefit for the Louisiana pinesnake under the ESA, which is the CCAA standard. The net effect of implementation of the activities would

be to increase the likelihood that the Louisiana pinesnake will persist in the occupied habitat and inhabit unoccupied habitat that are within their historical ranges.

### 3.2 Conservation Goals

***[What are the specific conservation goals for this Enrolled Property?]***

3) Implement habitat management actions on upland, pine-dominated forests, preferably by applying prescribed fire to maintain/improve herbaceous groundcover conditions and pocket gopher populations on preferable and suitable soils.

4) Implement conservation measures not directly related to habitat management that would minimize potential impacts to individual Louisiana pinesnakes.

## 4.0 Existing Characteristics and Management Activities

### 4.1 Existing Characteristics

***[Describe the extent and current characteristics of the enrolled property and their acreage (e.g., major plant communities or habitat types, soils, hydrology, etc.) in terms of appropriate habitat for the Louisiana pinesnake. Existing characteristics necessary to meet the CCAA standard may be expressed either as forest habitat (width, length, type of vegetation; including herbaceous species), current or recommended land use practices (best management practices), and existing agreements on the property. Also include a description of how property habitat conditions were determined.]***

### 4.2 Land Management Activities and Other Conservation Activities

#### 4.2.1 Available Conservation Activities

1) Habitat management actions on upland, pine-dominated forests:

Highest Conservation Priority Lands:
Lands that are determined to have the highest conservation priority through evaluation of the prioritization factors above will receive the most extensive LPS habitat conservation management and have implementation of appropriate non-habitat management measures.

Conservation measure 1 must be implemented on these lands. The Louisiana pinesnake is strongly associated with the historic longleaf pine dominated forests of the west central and west northern parts of Louisiana that experienced regular wildfires. Those open canopy forests with a high percent of herbaceous cover consistently provided quality habitat for the pocket gopher and LPS. Consequently, we recommend that the highest priority lands, as determined by the Service and LDWF, should have a longleaf pine restoration component and the use of prescribed fire. Other pine species may be used in the highest priority lands provided management actions are taken to meet mandatory management goals as described below.

The highest priority lands must attain the following management goals:

a. Greater than 40% herbaceous vegetation cover (average cover value determined by ocular estimate in a standard sample area) continuously for at least 90% of the time of the rotation. If prescribed fire is used, the herbaceous vegetation should be dense enough to carry the fire according to the burn interval guidelines described below (referred to as the "groundcover goals"); In the event that 40% herbaceous vegetation cover is not achieved, an Enrollee may be deemed to be in compliance with this measure if : suitable open canopy and midstory control (comparable to the level observed in areas where 40% herbaceous vegetation is achieved) is maintained, and where accumulated organic matter and herbicide application are not inhibiting growth of herbaceous vegetation;
b. Hardwood midstory (scrub-shrub) covering no more than 15% of the area;
c. Canopy pine trees that are maintained at a stocking sufficient to allow achievement and maintenance of the groundcover goals. Achievement of groundcover goals will require a sufficiently sparse canopy to allow adequate light penetration to the forest floor. In areas treated with prescribed fire where herbaceous groundcover alone is inadequate to achieve the burn interval guidelines described below, sufficient pine stocking needs to be maintained to provide the needle cast necessary to carry prescribed fire and achieve those goals.
d. The longest feasible harvest rotation interval (potentially managing for saw timber and poles on highest priority land) to reduce potential take from entry and maximize time-availability of suitable groundcover conditions in each stand.

Lower Conservation Priority Lands

Some of the lands that are determined to have a lower conservation priority through evaluation of the prioritization factors above will require comparatively less LPS habitat conservation management than the highest conservation priority lands plus appropriate non-habitat management measures. Other lower priority lands will only require non-habitat management conservation measures.

On lower conservation priority lands with habitat management action, harvest on enrolled pine stands will be scheduled to achieve a spatial pattern and extent of harvested area within managed tracts that is unlikely to compromise the persistence of adequate amounts of suitable LPS habitat on preferable/suitable soils in the managed areas.

a) Suitable LPS habitat (i.e., >40% herbaceous cover, etc.) should persist in a stand for intervals of at least 11 years if possible (estimated average generation time of LPS).
b) Suitable LPS habitat should be always be available in an adjacent stand within the average estimated home range of LPS.
c) Alternatively, on lands with habitat management action: Surveying and documentation of the presence of pocket gopher burrows throughout (forest interior as well as edges) the enrolled property would be accepted as evidence of suitable LPS habitat (assuming that soils are preferable or suitable).

Recommendations For Implementing Habitat Conservation Management

Midstory and ground cover goals can be achieved or maintained on longleaf or off-site pine

forests primarily and preferably through application of prescribed fire though the maximum amount of the rotation period, with burn return interval and season of burn adjusted to realize midstory and ground cover goals. General guidelines for prescribed fire are to achieve an average burn return interval of 2 to 3 years (varying the interval from one but no longer than 5 years) and to achieve a mix of dormant season and early and mid-growing season fires after fuel loads have been reduced adequately. In areas with heavy midstory, mechanical shearing (only allowed if no subsurface disturbance) and/or chemical treatment to reduce midstory prior to reintroduction of prescribed fire may be necessary (drum chopping and other forms of significant soil disturbance are not acceptable treatments). Treatment with approved herbicide will be identified in an approved CMA; herbicides must not be toxic to small mammals. In areas determined to be high priority, if feasible, prescribed fire should be primary treatment for midstory control. Mechanical entry/disturbance for timber harvest and other silvicultural actions should be minimized to the degree practicable. Use site preparation methods that avoid soil disturbance. Prescribed fire is recommended for site preparation when feasible. Bedding is not an acceptable treatment for site prep. Management may be directed to longleaf pine restoration in areas with suitable conditions (all uplands are assumed to be suitable for longleaf restoration unless determined otherwise). Longleaf restoration may occur as part of the timber management cycle and in accordance with the CMA. If feasible, even-aged loblolly or slash pine stands may be transitioned to longleaf stands, preferably by regeneration methods conducive to uneven-aged stand structure such as shelterwood, seed tree, small patch clearcuts, and strip cuts. If even-aged longleaf pine management is used, initial longleaf planting density shall be designed to allow the stand to meet the ground cover goals throughout the maximum amount of the rotation. Non-traditional or innovative longleaf restoration methods may be utilized as a means of testing new approaches where appropriate

2) Conservation measures not directly related to habitat management:

-Within or between known and potential LPS habitat: minimize and/or modify off-road vehicular use, reduce speed, limit use to periods of low LPS activity, consider/continue road closures (gates to control access), and avoid new road construction.

-Avoid the use of ECBs for erosion control. Instead use wildlife-compatible erosion control measures such as nontoxic, hydraulically applied erosion control products (HECP). Less desirable alternative methods include unwoven and unbounded organic fiber matrix type ECBs.

-Within enrolled property, in known occupied areas with recent (within 5 years) Louisiana pinesnake occurrence records adjacent to roads under the Enrollee's control, create slow speed zones; and where road mortalities or live snake crossings are sighted (2 or more instances occurring within a 0.5 mile diameter area during a period of 2 years or less) install wildlife crossings and associated fencing, or other measures (any measure would be coordinated with the Service) to facilitate safe passage of LPS while moving above ground.

-Establish and implement land user education programs to reduce the likelihood of direct and indirect mortality of LPS.

-Create public awareness programs that emphasize the importance of LPS conservation. Distribute outreach materials such as pamphlets, newsletter articles, signage, or other educational materials.

-On enrolled lands not likely to be suitable for LPS, efforts for conservation measures that don't involve habitat management should be commensurate with the acreage of that type of land to be enrolled

### 4.2.2 Agreement of Conservation Actions

The Enrollee agrees to implement the following management activities on the Enrolled Property:

***[Describe the habitat management and other non-habitat conservation activities required for enrollee to meet the CCAA standard and attach a map showing the boundaries of the property].***

### 4.2.3 Schedule of Conservation Actions Implementation

The Enrollee agrees to implement the agreed to conservation actions according to the following schedule.

***[Describe agreed upon time frames in which these management actions will begin and remain in effect to achieve the anticipated results required for enrollee to meet the CCAA standard.***

## 4.3 Adjustments to Existing Characteristics

In spite of implementation of the management activities set forth herein, incidents may occur on the Enrolled Property that are the result of neither the Enrollee nor its agent(s)' actions or inactions but unforeseen and/or beyond the Enrollee's control (e.g., *force majeure* events such as tornados, rainstorms, severe drought, fires, or insect/disease epidemics, etc.). The effects of such incidents on some or all of the existing characteristics could range from destruction to degradation. The effects on Louisiana pinesnakes could range from extirpation to an inability to continue to occupy the Enrolled Property due to the non-suitability or non-existence of habitat. In either scenario, the Louisiana pinesnake's numbers and/or habitat could be reduced below the "existing circumstances" described in Section 4.1, above, or reduced to the extent that the CCAA standard is no longer satisfied.

When such incidents occur, the Enrollee will not be held responsible for the resulting loss and may request, in writing, that the Parties amend the CMA to adjust the description of the existing circumstances on the Enrolled Property and/or the management activities to be implemented thereon. The Enrollee's request to amend must also include a grant of access to the Authorizing Parties and/or the designee of the Authorizing Parties to enter onto the Enrolled Property to determine whether bases exist to approve the request to amend. The approval or denial of the request must be in writing and, if granted, must be approved by the Service and include a detailed description of the extent to which the existing circumstances have been adjusted as well as specify changes to the management activities, if applicable. Each approval must be

denominated as an amendment to the CMA and appended as an exhibit to the CMA. If the destruction or degradation of the existing circumstances is such that the Enrolled Property no longer satisfies the CCAA standard, the CMA and Certificate must be terminated in accordance with Section 11.2, below.

**5.0 Responsibilities of the Parties**

Each Party, respectively, agrees to do the following:

Enrollee:

a. To notify the Authorizing Party within 30 days of a Louisiana pinesnake detection or encounter on the Enrolled Property.

b. To notify the Authorizing Party in writing at least 30 days in advance of implementing any planned land management activity not anticipated in the CCAA that the Enrollee reasonably anticipates to result in incidental take of Louisiana pinesnakes. Before engaging in any such activity, the Enrollee shall provide the Service and/or LDWF the opportunity to enter upon the Enrolled Property to capture and/or relocate any potentially affected Louisiana pinesnakes.

c. To refrain in all circumstances from impacting or disturbing Louisiana pinesnakes as specified in the CCAA.

d. To notify the Authorizing Party, in writing, within three working days of finding any dead Louisiana pinesnakes or of accidentally killing a Louisiana pinesnake.

e. To allow any of the Authorizing Parties and/or their designees to enter upon the Enrolled Property for the purposes specified in 50 C.F.R. § 13.21(e)(2) as well as for law enforcement activities. With the exception of law enforcement personnel, any of the Authorizing Parties or their designees shall be allowed to enter upon the Enrolled Property at any reasonable hour and time after providing the Enrollee with reasonable advance notice of 7 days or more.

f. To provide the Authorizing Party with information necessary to compile the required five-year status report described in the Agreement. Such information shall include, but is not limited to, a description of all management activities undertaken on the Enrolled Property for the Louisiana pinesnake and any activities that did or could have resulted in incidental take of Louisiana pinesnakes during the reporting period.

g. To consider implementing and/or engaging in the adaptive management recommendations of the Authorizing Party and/or the Service.

h. To seek technical assistance from the Authorizing Party and/or the Service or AGFC prior to undertaking activities not included herein to improve habitat on the Enrolled Property for the Louisiana pinesnake.

Authorizing Party:

a. To issue or to ensure that another of the Authorizing Parties issues a Certificate to the Enrollee upon execution of this Agreement by both Parties.

b. To provide technical assistance to the Enrollee, to the maximum extent practicable, upon request.

c. To monitor whether the Enrollee is implementing the terms of the Agreement and, if not, to inform the Enrollee, and to inform the other Authorizing Parties that the Enrollee is not in compliance with the terms and conditions of the Agreement and of measures the Enrollee will take/has undertaken to cure non-compliance.

d. To conduct compliance and biological monitoring with Service preparing the status reviews from such monitoring activities.

e. To recommend procedures to the Enrollee to avoid the occurrence of incidental take of Louisiana pinesnakes, particularly where actual occurrences of take have been disclosed in the biannual reports prepared in accordance with the Agreement.

f. To work with the Enrollee, other Authorizing Parties, and established watershed conservation groups on new management activities and adaptive management plans, as necessary.

g. To collect data, along with the Enrollee, on management activities implemented in accordance with this CMA, including, but not limited to, data related to management of the Louisiana pinesnake and on activities that resulted or could have resulted in incidental take of the species and to include such data in the biannual reports prepared in accordance with the Agreement.

## 6.0 Emergency Situations

Emergency situations arising from natural disasters (e.g., tornados, fire, excessive rainfall, extreme drought, insect infestations, epidemic disease, etc.) may require the initiation of certain land management actions that could result in incidental take of the Louisiana pinesnake. The Enrollee agrees to notify the Authorizing Party and the Se4rvice and/or NRCS in writing 14 days prior to land management activities stemming from an emergency situation and to allow the Service and/or NRCS to enter onto the Enrolled Property to conduct surveys and/or relocate Louisiana pinesnakes prior to implementation of the land management action(s).

If it is not possible to provide notice before implementing the action(s), the Enrollee agrees, to the maximum extent practicable, to implement such action(s) so as to avoid impacting locations on the Enrolled Property where Louisiana pinesnakes are known to occur. The Enrollee will notify the Authorizing Party and the Service, in writing, within ten working days of implementing any such action(s) and report all measures undertaken to avoid impacts to the

Louisiana pinesnake and, if take occurred, the amount of such take.

## 7.0 CMA and Certificate Duration

This CMA will be in effect until _____ [insert a date that is at least 30 years or until the end of the 99-year duration of the Agreement]. This CMA shall be effective when signed by both Parties and the Certificate is issued.

## 8.0 Incidental Take Authorization

The Certificate authorizing incidental take of Louisiana pinesnakes shall not become effective until such time as a Covered Species was officially listed as an "endangered" or "threatened" species under the ESA but would authorize take of the species incidental to the Enrollee engaging in otherwise lawful activities on the Enrolled Property. Such activities may include, but are not limited to, driving vehicles, small building or fence construction, grazing of livestock, gardening, forestry, hunting, farming, mowing, or cultivation of agricultural crops. The Enrollee may continue current land-use practices, management activities and activities specified herein, or undertake any other lawful use of the Enrolled Property even if such use results in take of a Covered Species or loss and/or degradation of habitat.

***[Describe level of take that may potentially occur on the enrolled property based on property acreage, habitat types, and current distribution and population status of the Louisiana pinesnake.]***

The Service recognizes that the level of take specified above is consistent with the overall goal of precluding the need to list the Louisiana pinesnake and that if the management activities are implemented on other necessary properties, there would be no need to list the species.

## 9.0 Regulatory Assurances

Through this CMA, the Enrollee is assured that no additional management activities or additional land, water, or resource use restrictions, beyond those voluntarily agreed to and described in Section 8.2 the "Management activities" of this CMA will be required should a Covered Species be listed under the ESA as "threatened" or "endangered" in the future.

The following assurances apply to the Enrollee only where the Certificate and this CMA are being properly implemented and only with respect to the Louisiana pinesnake.

(a) Changed circumstances provided for in this CMA. If additional management activities are necessary to respond to changed circumstances and the measures are set forth herein, the Enrollee will implement such measures in the event of changed circumstances.

(b) Changed circumstances not provided for in this CMA. If additional management activities not provided for in this CMA are necessary to respond to changed circumstances, the Service will not require any management activities in addition to those provided herein without the consent of the Enrollee.

(c) Unforeseen circumstances

(1) If additional management activities are necessary to respond to unforeseen circumstances, the Director of the Service may require additional measures of the Enrollee, but only if such measures are limited to modifications within the conservation measures set forth herein for the Louisiana pinesnake and only if those measures maintain the original terms of this CMA to the maximum extent possible. Additional management activities will not involve the commitment of additional land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources available for development or use under the original terms of this CMA without the consent of the Enrollee.

(2) The Service will have the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the Covered Species. The Service will consider, but not be limited to, the following factors:

(a) Size of the current range of the Louisiana pinesnake;
(b) Percentage of the Louisiana pinesnake's range adversely affected;
(c) Percentage of the Louisiana pinesnake's range conserved;
(d) Ecological significance of the portion of the Louisiana pinesnake's range affected by the CMA;
(e) Level of knowledge about the Louisiana pinesnake and the degree of specificity of the species' conservation program under this CMA; and
(6) Whether failure to adopt additional management activities would appreciably reduce the likelihood of survival and recovery of the Louisiana pinesnake in the wild.

## 10.0 Funding

The Enrollee will be responsible for funding all management activities undertaken pursuant to this CMA. The Authorizing Party will inform the Enrollee of potential funding opportunities through state, federal, or private grant programs that may be relevant and available.

## 11.0 Terms and Conditions

In addition to the matters set forth herein, this CMA is subject to the terms and conditions of the Agreement and the Permit, both of which are incorporated herein by reference.

## 11.1 Modification of CMAs

The Authorizing Party and/or the Enrollee may propose minor modifications or amendments to this CMA by providing written notice to the other and to the Service. Such notice shall include a statement of the proposed modification, the reason for the proposed modification, and the expected results of the modification. Each Party agrees to use its best efforts to respond to proposed modifications within 60 calendar days of receiving the notice. Proposed minor modifications or amendments to this CMA will become effective upon written concurrence by the non-proposing Party and Service. If the proposed modification or amendment is deemed by

the Service to be major, it must be processed in the manner set forth in Part 13.3 of the Agreement.

### 11.2 Termination of the CMA

The Enrollee must give the Authorizing Party ninety (90) days written notice, via certified letter, of its intent to terminate this CMA. The Enrollee also must provide the Authorizing Parties and/or their designees to enter upon the Enrolled Property to capture and relocate Louisiana pinesnakes within thirty (30) days of the written notice. As provided for in Part of the Service's Candidate Conservation Agreement with Assurances Policy (FR), the Enrollee may terminate this CMA prior to the expiration date for circumstances beyond the Enrollee's control.

Provided that the existing conditions and responsibilities have been maintained, the Enrollee, subject to the previously mentioned notice requirement and opportunity to relocate Louisiana pinesnakes, may return the enrolled property to baseline conditions, even if the expected benefits have not been realized. If the Enrollee is unable to continue implementation of the management activities, plans and provisions of this CMA, whether due to catastrophic destruction of the species population numbers or habitat or due to unforeseen hardship, the Enrollee agrees to relinquish the Certificate of Inclusion to LDWF or Service. Termination of this CMA terminates the Certificate.

### 11.3 Suspension or Revocation of the Certificate

The Service may suspend or revoke the Enrollee's Certificate if the Enrollee breaches the obligations set forth in this CMA and fails to cure such breach in a timely manner.

### 11.4 Succession and Transfer

The Certificate may be transferred in accordance with 50 C.F.R. § 13.25. The Enrollee agrees to notify the Authorizing Party and the Service, in writing, of any transfer of ownership of the Enrolled Property, whether in part or in whole, at least 90 calendar days prior to the intended transfer in order to provide the Authorizing Party and/or the Service the opportunity to contact the new owner, explain the responsibilities applicable to the Enrolled Property, and seek to interest the new owner in becoming a party to the CMA or in entering into a new CMA.

### 11.5 Remedies

Each Party shall have all remedies otherwise available to enforce the terms of this CMA and the Certificate.

## 12.0 Relationship to Other Documents

This CMA is subordinate to the Agreement and the associated Permit.

## 13.0 Other Species

The Enrollee is not required to survey for other federally-listed species. However, neither this CMA nor the Certificate provides regulatory assurances or incidental take authorization, respectively for species other than the Louisiana pinesnake.

**14.0 Effective Date**

This CMA shall be effective and binding on the date of the last signature, below, and upon issuance of the Certificate.

**15.0 Notification**

Communication, reports, and correspondence required by this CMA should be directed to the persons listed below. The names and contact information may be changed upon written notice to the persons listed below.

ENROLLEE:
Landowner: Manager
Address
(Telephone)

AUTHORIZING PARTIES:

Service: Field Office Supervisor
Louisiana Ecological Services Office

LDWF: Natural Heritage Program Manager

IN WITNESS WHEREOF, each party hereto has caused this Conservation Management Agreement to be executed by an authorized official on the day and year set forth below their signature.

ENROLLEE

By: _____
Name and Title

Date: _____

AUTHORIZING PARTY

***[INSERT Louisiana Department of Wildlife and Fisheries]***

By: _____
[Name and Title]

Date: _____

AUTHORIZING PARTY

***[INSERT U. S. Fish and Wildlife Service, Louisiana Ecological Services Office]***

By: _____
[Name and Title]

Date: _____

**Attachment 2**
**Certificate Of Inclusion**

This certifies that the property described as follows [legal description of property covered by the Candidate Conservation Agreement with Assurances Permit] owned by [Enrollee's name], is included within the scope of the Section 10(a)(1)(A) permit issued by the U.S. Fish and Wildlife Service expiring on [date] under the authority of Section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended [reference number]. The Permit authorizes certain activities by the [Enrollee] as part of the Candidate Conservation Agreement program to protect, enhance, or restore populations of Louisiana pinesnakes in Louisiana, in the historical range of the Louisiana pinesnake, and in Winn, Grant, and Allen Parishes. The holder of this Certificate is authorized to engage in any otherwise lawful activity on the above described property that may result in the incidental taking of the Louisiana pinesnake or its habitat, should the species become listed, above predetermined existing conditions subject to the terms and conditions of the Permit. This Certificate is only valid for as long as the Enrollee fulfills the responsibilities as described in the Conservation Management Agreement [reference number] entered into by [insert Louisiana Department of Wildlife and Fisheries] and [Enrollee's name] on [date].

These authorizations and assurances expire on [Date permit expires].

_____
[Name and Title]

Date: _____

**Attachment 3**
**Compliance Actions**
**National Historic Preservation Act – Section 106**

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470 *et seq.*) requires Federal agencies to take into account the effects of their undertakings on properties eligible for inclusion in the National Register of Historic Places 9 (NRHP). An undertaking is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency, those carried out with federal financial assistance, those requiring a federal permit, license or approval, and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency.

This Agreement has been reviewed and evaluated by the Region 4, Ecological Services Staff Archeologist. The overall agreement does not meet the definition for an undertaking as defined in 36 CFR 800 since the Agreement is concerned with future actions that have not yet occurred.

In addition, the management activities are the type of actions that, by themselves, are unlikely to affect any cultural resources that may be present on a specific Enrollee's property. Past review and field evaluations of the type of management activities listed on pages 8 and 9 of this Agreement indicate that it is reasonable to assume that cultural resources will not be affected by the implementation of this Agreement.

The staff archeologist is available to assist the Louisiana Ecological Services Office and any Party or Enrollee on a project by project evaluation, should any conservation measure be planned that will require significant soil disturbance or the removal of a structure or building 50 years old or older.

**Attachment 4**
**Candidate Conservation Agreement**
**Assurances to the LDWF and Cooperators**

The assurances listed below apply to the LDWF and/or affected Enrollee(s). The assurances apply only where the enhancement of survival permit associated with the CCAA authorities and the CCAA element of the Agreement are being properly implemented and only with respect to species adequately covered by the CCAA.

(1) Changed circumstances provided for in the CCAA. If additional management activities are necessary to respond to changed circumstances and the measures were set forth in the operating conservation program of the Enrollee's Conservation Management Agreement (CMA), the Enrollee and the Parties will implement the measures specified in the affected CMA(s).

(2) Changed circumstances not provided for in the CCAA. If additional management activities not provided for in the CMA's operating conservation program are necessary to respond to changed circumstances, the Service will not require any management activities in addition to those provided for in the CMA without the consent of the Enrollee.

(3) Unforeseen circumstances. (A) If additional management activities are necessary to respond to unforeseen circumstances, Service may require additional measures of the Enrollee and/or Parties, but only if such measures are limited to modifications within the CMA's management activities and programs for the affected species, and only if those measures maintain the original terms of the CCAA elements of the Agreement and the CMA to the maximum extent possible. Additional management activities will not involve the commitment of additional land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources available for development or use under the original terms of the CCAA and/or CMA without the consent of the affected Enrollee and other affected Party(ies).

Service will have the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species. Service will consider, but not be limited to, the following factors: (1) Size of the current range of the affected species; (2) Percentage of range adversely affected; (3) Percentage of range conserved; (4) Ecological significance of that portion of the range affected; (5) Level of knowledge about the affected species and the degree of specificity of the species' conservation program; and (6) Whether failure to adopt additional management activities would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

**Attachment 5**

**Cooperator/Landowner Waiver to Release Information to Other Parties**

I do hereby grant permission to release all personal information, status review information, compliance and biological monitoring information, and any other pertinent information pertaining to my responsibilities as specified in the *Programmatic Candidate Conservation Agreement with Assurances for the Louisiana pinesnake* and the associated Cooperative Management Agreement to U. S. Fish and Wildlife Service, and The Louisiana Department of Wildlife and Fisheries. Such information may be subject to The Privacy Act of 1974, as amended (5 U. S. C. subsection 552a), or other applicable laws otherwise protected by the terms of the aforementioned agreement.

_____

Enrollee Name

_____

Signature

_____

Date