DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2014–0046; 4500030113]

RIN 1018–BA03

Endangered and Threatened Wildlife and Plants; Threatened Species Status for Black Pinesnake With 4(d) Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine threatened species status under the Endangered Species Act of 1973 (Act), as amended, for the black pinesnake (*Pituophis melanoleucus lodingi*), a reptile subspecies from Alabama, Louisiana, and Mississippi. The effect of this rule is to add this subspecies to the List of Endangered and Threatened Wildlife. We are also adopting a rule under the authority of section 4(d) of the Act (a ''4(d) rule'') to provide for the conservation of the black pinesnake.

DATES: This rule is effective November 5, 2015.

ADDRESSES: This final rule is available on the Internet at *http://www.regulations.gov* and *http://www.fws.gov/mississippiES/*. Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection at *http://www.regulations.gov*. All of the comments, materials, and documentation that we considered in this rulemaking are available by appointment, during normal business hours at: U.S. Fish and Wildlife Service, Mississippi Ecological Services Field Office, 6578 Dogwood View Parkway, Jackson, MS 39213; by telephone at 601–965–4900; or by facsimile at 601–965–4340.

FOR FURTHER INFORMATION CONTACT: Stephen Ricks, Field Supervisor, U.S. Fish and Wildlife Service, Mississippi Ecological Services Field Office, 6578 Dogwood Parkway, Jackson, MS 39213; by telephone 601–965–4900; or by facsimile 601–965–4340. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species may warrant protection through listing if we determine that it is endangered or threatened throughout all or a significant portion of its range. Listing a species as an endangered or threatened species can only be completed by issuing a rule.

This rule lists the black pinesnake *(Pituophis melanoleucus lodingi)* as a threatened species. It includes provisions published under the authority of section 4(d) of the Act that are necessary and advisable to provide for the conservation of the black pinesnake.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the black pinesnake is threatened based on four of these five factors (Factors A, C, D, and E), specifically the past and continuing loss, degradation, and fragmentation of habitat in association with silviculture, urbanization, and fire suppression; road mortality; and the intentional killing of snakes by individuals.

Peer review and public comment. We sought comments from independent specialists to ensure that our determination is based on scientifically sound data, assumptions, and analyses. We also considered all comments and information we received during two public comment periods.

Previous Federal Action

Federal actions for the black pinesnake prior to publication of the proposed listing rule are outlined in that rule, which was published on October 7, 2014 (79 FR 60406). Publication of the proposed rule opened a 60-day comment period, which closed on December 8, 2014. On March 11, 2015, we published a proposed critical habitat designation for the black pinesnake (80 FR 12846) and invited the public to comment on the critical habitat proposal; the entire October 7, 2014, proposed listing rule; and the draft economic analysis of the proposed critical habitat designation. This second 60-day comment period ended on May 11, 2015.

We will finalize the designation of critical habitat for the black pinesnake at a later date.

Background

Species Information

Species Description and Taxonomy

Pinesnakes (genus *Pituophis*) are large, non-venomous, oviparous (egg-laying) constricting snakes with keeled scales and disproportionately small heads (Conant and Collins 1991, pp. 201–202). Their snouts are pointed. Black pinesnakes are distinguished from other pinesnakes by being dark brown to black both on the upper and lower surfaces of their bodies. There is considerable individual variation in adult coloration (Vandeventer and Young 1989, p. 34), and some adults have russet-brown snouts. They may also have white scales on their throat and ventral surface (Conant and Collins 1991, p. 203). In addition, there may also be a vague pattern of blotches on the end of the body approaching the tail. Adult black pinesnakes range from 48 to 76 inches (in) (122 to 193 centimeters (cm)) long (Conant and Collins 1991, p. 203; Mount 1975, p. 226). Young black pinesnakes often have a blotched pattern, typical of other pinesnakes, which darkens with age. The subspecies' defensive posture when disturbed is particularly interesting; when threatened, it throws itself into a coil, vibrates its tail rapidly, strikes repeatedly, and utters a series of loud hisses (Ernest and Barbour 1989, p. 102).

Pinesnakes (*Pituophis melanoleucus*) are members of the Class Reptilia, Order Squamata, Suborder Serpentes, and Family Colubridae. There are three recognized subspecies of *P. melanoleucus* distributed across the eastern United States (Crother 2012, p. 66; Rodriguez-Robles and De Jesus-Escobar 2000, p. 35): The northern pinesnake (*P. m. melanoleucus*); black pinesnake (*P. m. lodingi*); and Florida pinesnake (*P. m. mugitus*). The black pinesnake was originally described by Blanchard (1924, pp. 531–532), and is geographically isolated from all other pinesnakes. However, there is evidence that the black pinesnake was in contact with other pinesnakes in the past. A form intermediate between *P. m. lodingi* and *P. m. mugitus* occurs in Baldwin and Escambia Counties, Alabama, and Escambia County, Florida, and may display morphological characteristics of both subspecies (Conant 1956, pp. 10–11). These snakes are separated from populations of the black pinesnake by the extensive Tensas-Mobile River Delta and the Alabama River, and it is unlikely that there is currently gene flow between pinesnakes across the Delta (Duran 1998a, p. 13; Hart 2002, p.

23). A study on the genetic structure of the three subspecies of *P. melanoleucus* (Getz *et al.* 2012, p. 2) showed evidence of mixed ancestry, and supported the current subspecies designations and the determination that all three are genetically distinct groups. Evidence suggests a possible historical intergradation between *P. m. lodingi* and *P. ruthveni* (Louisiana pinesnake), but their current ranges are no longer in contact and intergradation does not presently occur (Crain and Cliburn 1971, p. 496).

Habitat

Black pinesnakes are endemic to the longleaf pine ecosystem that once covered the southeastern United States. Optimal habitat for these snakes consists of sandy, well-drained soils with an open-canopied overstory of longleaf pine, a reduced shrub layer, and a dense herbaceous ground cover (Duran 1998a, p. 2). Duran (1998b, pp. 1–32) conducted a radio-telemetry study of the black pinesnake that provided data on habitat use. Snakes in this study were usually located on well-drained, sandy-loam soils on hilltops, on ridges, and toward the tops of slopes in areas dominated by longleaf pine. With other habitat types readily available on the landscape, we can infer that these upland habitats were preferred by black pinesnakes. They were rarely found in riparian areas, hardwood forests, or closed canopy conditions. From radio-telemetry studies, black pinesnakes were located below ground 53 to 70 percent of the time (Duran 1998a, p. 12; Yager *et al.* 2005, p. 27; Baxley and Qualls 2009, p. 288). These locations were usually in the trunks or root channels of rotting pine stumps.

During two additional radiotelemetry studies, individual pinesnakes were observed in riparian areas, hardwood forests, and pine plantations periodically, but the majority of their time was still spent in intact upland longleaf pine habitat. While they used multiple habitat types periodically, they repeatedly returned to core areas in the longleaf pine uplands and used the same pine stump and associated rotted-out root system from year to year, indicating considerable site fidelity (Yager, *et al.* 2006, pp. 34–36; Baxley 2007, p. 40). Several radio-tracked juvenile snakes were observed using mole or other small mammal burrows rather than the bigger stump holes used by adult snakes (Lyman *et al.* 2007, pp. 39–41).

Pinesnakes have shown some seasonal movement trends of emerging from overwintering sites in February, moving to an active area from March until September, and then moving back to their overwintering areas (Yager *et al.* 2006, pp. 34–36). The various areas utilized throughout the year may not have significantly different habitat characteristics, but these movement patterns illustrate that black pinesnakes may need access to larger, unfragmented tracts of habitat to accommodate fairly large home ranges while minimizing interactions with humans.

Life History

Black pinesnakes are active during the day but only rarely at night. As evidenced by their pointed snout and enlarged rostral scale (the scale at the tip of their snout), they are accomplished burrowers capable of tunneling in loose soil, potentially for digging nests or excavating rodents for food (Ernst and Barbour 1989, pp. 100–101). Black pinesnakes are known to consume a variety of food, including nestling rabbits (*Sylvilagus aquaticus*), bobwhite quail (*Colinus virginianus*) and their eggs, and eastern kingbirds (*Tyrannus tyrannus*) (Vandeventer and Young 1989, p. 34; Yager *et al.* 2005, p. 28); however, rodents represent the most common type of prey. The majority of documented prey items are hispid cotton rats (*Sigmodon hispidus*), various species of mice (*Peromyscus* spp.), and, to a lesser extent, eastern fox squirrels (*Sciurus niger*) (Rudolph *et al.* 2002, p. 59; Yager *et al.* 2005, p. 28). During field studies of black pinesnakes in Mississippi, hispid cotton rats and cotton mice (*Peromyscus gossypinus*) were the most frequently trapped small mammals within black pinesnake home ranges (Duran and Givens 2001, p. 4; Baxley 2007, p. 29). These results suggest that these two species of mammals represent essential components of the snake's diet (Duran and Givens 2001, p. 4).

Duran and Givens (2001, p. 4) estimated the average size of individual black pinesnake home ranges (Minimum Convex Polygons (MCPs)) at Camp Shelby, Mississippi, to be 117.4 acres (ac) (47.5 hectares (ha)) using data obtained during their radio-telemetry study. A more recent study conducted at Camp Shelby, a National Guard training facility operating under a special use permit on the De Soto National Forest (NF) in Forrest, George, and Perry Counties, Mississippi, provided home range estimates from 135 to 385 ac (55 to 156 ha) (Lee 2014a, p. 1). Additional studies from the De Soto NF and other areas of Mississippi have documented somewhat higher MCP home range estimates, from 225 to 979 ac (91 to 396 ha) (Baxley and Qualls 2009, p. 287). The smaller home range sizes from Camp Shelby may be a reflection of the higher habitat quality at the site (Zappalorti *in litt.* 2015), as the snakes may not have to travel great distances to meet their ecological needs. A modeling study of movement patterns in bullsnakes (*Pituophis catenifer sayi*) revealed that home range sizes increased as a function of the amount of avoided habitat, such as agricultural fields (Kapfer *et al.* 2010, p. 15). As snakes are forced to increase the search radius to locate preferred habitat, their home range invariably increases.

The dynamic nature of individual movement patterns supports the premise that black pinesnake habitat should be maintained in large unfragmented parcels to sustain survival of a population. In the late 1980s, a gopher tortoise preserve of approximately 2,000 ac (809 ha) was created at Camp Shelby. This preserve, which has limited habitat fragmentation and has been specifically managed with prescribed burning and habitat restoration to support the recovery of the gopher tortoise, is centrally located within a much larger managed area (over 100,000 ac (40,469 ha)) that provides habitat for one of the largest known populations of black pinesnakes in the subspecies' range (Lee 2014a, p. 1).

No population and habitat viability analyses have been conducted for the black pinesnake due primarily to a lack of essential life-history and demographic data, such as estimates of growth and reproductive rates, as is the case for many snake species (Dorcas and Willson 2009, p. 36; Willson *et al.* 2011, pp. 42–43). However, radio-tracking studies have shown that a reserve area should include an unconstrained (unfragmented) activity area large enough to accommodate the long-distance movements that have been reported for the subspecies (Baxley and Qualls 2009, pp. 287–288). As with many snake species, fragmentation by roads, urbanization, or incompatible habitat conversion continues to be a major threat affecting the black pinesnake (see discussion below under *Factor E: Other Natural or Manmade Factors Affecting Its Continued Existence*).

Very little information on the black pinesnake's breeding and egg-laying is available from the wild. Lyman *et al.* (2007, p. 39) described the time frame of mid-May through mid-June as the period when black pinesnakes breed at Camp Shelby, and mating activities may take place in or at the entrance to armadillo burrows. However, Lee (2007, p. 93) described copulatory behavior in a pair of black pinesnakes in late

September. Based on dates when hatchling black pinesnakes have been captured, the potential nesting and egg deposition period of gravid females extends from the last week in June to the last week of August (Lyman *et al.* 2009, p. 42). In 2009, a natural nest with a clutch of six recently hatched black pinesnake eggs was found at Camp Shelby (Lee *et al.* 2011, p. 301) at the end of a juvenile gopher tortoise burrow. As there is only one documented natural black pinesnake nest, it is unknown whether the subspecies exhibits nest site fidelity; however, nest site fidelity has been described for other *Pituophis* species. Burger and Zappalorti (1992, pp. 333–335) conducted an 11-year study of nest site fidelity of northern pinesnakes in New Jersey, and documented the exact same nest site being used for 11 years in a row, evidence of old egg shells in 73 percent of new nests, and recapture of 42 percent of female snakes at prior nesting sites. The authors suggest that females returning to a familiar site should have greater knowledge of available resources, basking sites, refugia, and predator pressures; therefore they would have the potential for higher reproductive success compared with having to find a new nest site (Burger and Zappalorti 1992, pp. 334–335). If black pinesnakes show similar site fidelity, it follows that they too might have higher reproductive success if their nesting sites were to remain undisturbed.

Specific information about underground refugia of the black pinesnake was documented during a study conducted by Rudolph *et al.* (2007, p. 560), which involved excavating five sites used by the subspecies for significant periods of time from early December through late March. The pinesnakes occurred singly at shallow depths (mean of 9.8 in (25 cm); maximum of 13.8 in (35 cm)) in chambers formed by the decay and burning of pine stumps and roots (Rudolph *et al.* 2007, p. 560). The refugia were not excavated by the snakes beyond minimal enlargement of the preexisting chambers. These sites are not considered true hibernacula because black pinesnakes move above ground on warm days throughout all months of the year (Rudolph *et al.* 2007, p. 561; Baxley 2007, pp. 39–40). Means (2005, p. 76, and references therein) suggested that longleaf pine is likely to be more important than other southern pine species to animals using stumpholes, because longleaf pine has a more resinous heartwood, deeper taproot, and lateral roots spreading out 50 feet (ft) (15.2 meters (m)) or more.

Longevity of wild black pinesnakes is not well documented, but can be at least 11 years, based on recapture data from Camp Shelby (Lee 2014b, pers. comm.). The longevity record for a captive male black pinesnake is 14 years, 2 months (Slavens and Slavens 1999, p. 1). Recapture and growth data from black pinesnakes on Camp Shelby indicate that they may not reach sexual maturity until their 4th or possibly 5th year (Yager *et al.* 2006, p. 34).

Potential predators of black pinesnakes include red-tailed hawks (*Buteo jamaicensis*), raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*), red foxes (*Vulpes vulpes*), feral cats (*Felis catus*), and domestic dogs (*Canis familiaris*) (Ernst and Ernst 2003, p. 284; Yager *et al.* 2006, p. 34; Lyman *et al.* 2007, p. 39).

Historical/Current Distribution

There are historical records for the black pinesnake from one parish in Louisiana (Washington Parish), 14 counties in Mississippi (Forrest, George, Greene, Harrison, Jackson, Jones, Lamar, Lauderdale, Marion, Pearl River, Perry, Stone, Walthall, and Wayne Counties), and 3 counties in Alabama west of the Mobile River Delta (Clarke, Mobile, and Washington Counties). Historically, populations likely occurred in all of these contiguous counties; however, current records do not support the distribution of black pinesnakes across this entire area. Recently, a black pinesnake was observed in a new county, Lawrence County, Mississippi, where the subspecies had not previously been documented (Lee 2014b, p. 1). However, is not known whether this snake represents a new extant population.

Duran (1998a, p. 9) and Duran and Givens (2001, p. 24) concluded that black pinesnakes have likely been extirpated from Louisiana and from two counties (Lauderdale and Walthall) in Mississippi. In these two studies, all historical and current records were collected; land managers from private, State, and Federal agencies with local knowledge of the subspecies were interviewed; and habitat of all historical records was visited and assessed. As black pinesnakes have not been reported west of the Pearl River in either Mississippi or Louisiana in over 30 years, and since there are no recent (post-1979) records from Pearl River County (Mississippi), we believe them to likely be extirpated from that county as well.

In general, pinesnakes are particularly difficult to survey given their tendency to remain below ground most of the time. However, a review of records, interviews, and status reports, coupled with a Geographic Information System (GIS) analysis of current suitable habitat, indicated that black pinesnakes likely remain in all historical counties in Alabama and in 11 out of 14 historical counties in Mississippi (Forrest, George, Greene, Harrison, Jackson, Jones, Lamar, Marion, Perry, Stone, and Wayne Counties). Black pinesnake populations in many of the occupied counties in Mississippi occur in the De Soto NF. Much of the habitat outside of De Soto NF has become highly fragmented, and populations on these lands appear to be small and isolated on islands of suitable habitat (Duran 1998a, p. 17; Barbour 2009, pp. 6–13).

Population Estimates and Status

Duran and Givens (2001, pp. 1–35) reported the results of a habitat assessment of all black pinesnake records (156) known at the time of their study. Habitat suitability of the sites was based on how the habitat compared to that selected by black pinesnakes in a previously completed telemetry study of a population occupying what was considered high-quality habitat (Duran 1998b, pp. 1–44). Black pinesnake records were joined using a contiguous suitable habitat model (combining areas of suitable habitat with relatively unrestricted gene flow) to create ''population segments'' (defined as ''that portion of the population located in a contiguous area of suitable habitat throughout which gene flow is relatively unrestricted'') from the two-dimensional point data. These population segments were then assessed using a combination of a habitat suitability rating and data on how recently and/or frequently black pinesnakes had been recorded at the site. By examining historical population segments, Duran and Givens (2001, p. 10) determined that 22 of the 36 (61 percent) population segments known at the time of their study were either extirpated (subspecies no longer present), or were in serious jeopardy of extirpation. During the development of this listing rule, we used GIS to reassess the habitat suitability of the 14 population segments not determined to be in serious jeopardy of extirpation by Duran and Givens (2001, p. 10). Our estimate of the number of populations was derived by overlaying habitat from a current GIS analysis with the locality record data (post-1990) from species/subspecies experts, Natural Heritage Programs, State wildlife agencies, and the site assessments of Duran and Givens (2001, pp. 1–35) and Barbour

(2009, pp. 1–36). We used locality records back to 1990, because this date coincides with that chosen by Duran and Givens (2001, pp. 1–35) and Barbour (2009, pp. 1–36) in their comprehensive black pinesnake habitat assessments. Using the movement and home range data provided by black pinesnake researchers (Duran 1998b, pp. 15–19; Yager *et al.* 2005, pp. 27–28; Baxley and Qualls 2009, pp. 287–288), a population was determined to be distinct if it was separated from other localities by more than 1.3 miles (mi.) (2.1 kilometers (km)). Using our recent assessment, we estimate that 11 of the 14 populations of black pinesnakes remain extant today. Five of these 11 populations occur in Alabama and 6 in Mississippi. However, current data are insufficient to make a determination of the number of individuals that comprise each remaining population.

Our current GIS analysis indicates that 3 of the 11 remaining black pinesnake populations, all located in Alabama and lacking recent records, are not likely to persist long term due to: Presence on, or proximity to, highly fragmented habitat; lack of protection and habitat management for the site; or both. The majority of the known black pinesnake records, and much of the best remaining habitat, occurs within the two ranger districts that make up the De Soto NF in Mississippi. These lands represent a small fraction of the former longleaf pine ecosystem that was present in Louisiana, Mississippi, and Alabama, and was historically occupied by the subspecies. At this time, we believe the six populations in Mississippi (five on the De Soto NF and one in Marion County) and two sites in Alabama (in Clarke County) are the only ones considered likely to persist long term because of their presence on relatively unfragmented forest and protection or management afforded to the habitat or subspecies.

Summary of Comments and Recommendations

In the proposed rule published on October 7, 2014 (79 FR 60406), we requested that all interested parties submit written comments on the proposal by December 8, 2014. We reopened the comment period on the listing proposal on March 11, 2015 (80 FR 12846) with our publication of a proposed critical habitat designation for the subspecies. This second 60-day comment period ended on May 11, 2015. During both comment periods, we also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Newspaper notices inviting general public comment were published in the Mobile Press Register and Hattiesburg American on October 12, 2014, and again on March 15, 2015. We also presented several webinars on the proposed listing and critical habitat rules, and invited all stakeholders, media, and congressional representatives to participate and ask any questions. The webinar information was posted on our Web site along with copies of the proposed listing rule, press release, and a question/answer document. We did not receive any requests for a public hearing within the designated timeframe. During the two comment periods for the proposed rule, we received nearly 300 comments addressing the proposed listing and critical habitat rules. In this final rule, we address only the comments regarding the proposed listing and the associated rule under section 4(d) of the Act (16 U.S.C. 1531 *et seq.*). Comments specific to the proposed critical habitat designation (80 FR 12846) for this subspecies will be addressed in the final critical habitat determination at a later date. All relevant substantive information provided during comment periods has either been incorporated directly into this final determination or is addressed below.

Peer Reviewer Comments

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinion from six knowledgeable individuals with scientific expertise that included familiarity with the black pinesnake and its habitat, biological needs, and threats, as well as those with experience in studying other pinesnake species. We received responses from all of the peer reviewers.

We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the listing of black pinesnake. The peer reviewers generally concurred with our methods and conclusions, and provided additional information, clarifications, and suggestions to improve this final rule. Four of the peer reviewers specifically expressed their support for the subspecies' listing as a threatened species; a fifth peer reviewer questioned our characterization that the rate of decline had moderated for this subspecies due to conservation actions, and suggested the black pinesnake might actually qualify as endangered. The sixth peer reviewer limited her comments to the critical habitat proposal and did not specifically address the proposed listing rule. Several peer reviewers noted that information was limited on some life-history attributes but stated that, based on the best available information, the Service had presented a compelling case for listing as threatened. Four of the peer reviewers stressed the importance of stump holes and associated root systems to the subspecies and most noted the importance of conserving outlying populations to support conservation genetics of the subspecies. Substantive peer reviewer comments are addressed in the following summaries and incorporated into the final rule as appropriate.

(1) Comment: Peer reviewers provided additional information and suggestions for clarifying and improving the accuracy of the information in the ''Habitat,'' ''Life History,'' ''Historical/Current Distribution,'' Summary of Factors Affecting the Species, and Available Conservation Measures sections of the preamble of the proposed rule.

Our Response: We appreciate these corrections and suggestions, and have made changes to this final rule to reflect the peer reviewers' input.

(2) Comment: Two peer reviewers stated that our characterization of ''open canopy'' as ≤70 percent canopy coverage in our discussion of target suitable black pinesnake habitat, under the ''Provisions of the Proposed Special Rule'' section, was not appropriate. They stated that studies have shown that pinesnakes more frequently utilize areas with <50 percent canopy coverage.

Our Response: There appears to be some variability in the literature as to what percentage of canopy closure constitutes an open canopy. Therefore, we have removed any reference of a specific value for canopy coverage as optimal habitat for the black pinesnake in this final rule. We have focused instead on the presence of an abundant herbaceous groundcover, which is a component of optimal habitat for this subspecies and is provided for in an appropriately open-canopied forest.

(3) Comment: One peer reviewer stated that the increasing use of erosion control blankets (ECBs) containing polypropylene mesh poses a potential threat to black pinesnakes. ECBs, which are often used for erosion control on pipeline construction projects, but may also be used for bird exclusion, have been documented to entangle many species of snakes, causing lacerations and mortality. They often take years to decompose, presenting a long-term entanglement hazard, even when discarded.

Our Response: We appreciate this new information, and have made changes to this final rule to reflect the

peer reviewer's input (see ''*Factor E: Other Natural or Manmade Factors Affecting Its Continued Existence*'' in the Summary of Factors Affecting the Species section, below).

(4) Comment: One peer reviewer and several public commenters questioned whether our determination of ''threatened'' was appropriate, instead of ''endangered.'' While the public commenters provided no justification for their statements, the peer reviewer suggested there are no data that indicate rates of population decline have moderated; therefore it is possible that the decline has accelerated. The peer reviewer mentioned that there have been minimal conservation accomplishments concerning the black pinesnake throughout its intermittent status as a candidate species over the last 30 years.

Our Response: The Act defines an endangered species as any species that is ''in danger of extinction throughout all or a significant portion of its range'' and a threatened species as any species ''that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.'' The determination to list the black pinesnake as threatened was based on the best available scientific and commercial data on its status, the existing and potential threats to the subspecies, and ongoing conservation actions. While it may be difficult to determine the ultimate success of these conservation actions, we know that discussions between the Service and our public lands partners, in particular, have resulted in new language within their formal management plans to protect and enhance black pinesnake habitat. For example, the Mississippi Army National Guard (MSARNG) has amended its integrated natural resources management plan (INRMP) to provide for the protection and management of the black pinesnake (see ''Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range'' under Factor A in the Summary of Factors Affecting the Species section, below).

We find that endangered status is not appropriate for the black pinesnake because, while we found the threats to the subspecies to be significant and rangewide, we did not find that the threats currently place the subspecies in danger of extinction throughout all or a significant portion of its range. Although there is a general decline in the overall range of the subspecies and its available habitat, we believe that the rate of decline has slowed in recent years due to restoration efforts, and range contraction is not severe enough to indicate imminent extinction. Therefore, we find that the black pinesnake meets the definition of a threatened species based on the immediacy, severity, and scope of the threats described above (see Determination section, below).

(5) Comment: Two peer reviewers and several public commenters questioned our determination that illegal collection from the wild was not a significant threat to the black pinesnake. One peer reviewer suggested that people in the pet trade may value wild-caught individuals with novel genetics, while public commenters postulated that the listing of the pinesnake may make it more difficult for enthusiasts and hobbyists to purchase individuals, therefore snakes from wild populations may be more vulnerable to collection. Additionally, a peer reviewer suggested that illegal collection would have a drastic impact on those populations that may have only a few individuals.

Our Response: In this final listing rule, we continue to rely upon the best scientific and commercial information available, which in this case includes correspondence with individuals who have experience with the history of the pinesnake pet trade in the area (see ''*Factor B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*'' in the Summary of Factors Affecting the Species section, below). Those sources maintained that the need for collection of wild specimens is thought to have declined dramatically due to the pet trade being currently saturated with captive-bred black pinesnakes. There is no information available to suggest that illegal collection will increase once the subspecies is listed (and no new information to support this was received during the comment periods). Since the black pinesnake is fossorial (and thus difficult to locate), and does not overwinter in communal den sites, we believe this potential threat to be minor.

(6) Comment: Two peer reviewers and a number of public commenters stated that using locality data from 1990 as support for presence of extant populations may not reflect the current status of black pinesnakes and the subspecies may have since disappeared from these sites. On the other hand, a third peer reviewer stated that the lack of records for several decades in an area is not sufficient evidence to support that black pinesnakes have been extirpated from that area if some suitable habitat still exists.

Our Response: As we discussed in ''Population Estimates and Status'' in the Background section (above), we used data dated back to 1990, which is consistent with the date used by black pinesnake researchers to represent occupied localities in their comprehensive habitat assessments of black pinesnake localities. These records and the researchers' reports represent the best scientific data available at the time of listing. We conducted an updated GIS habitat analysis of the areas containing the post-1990 records, and if we found that sufficient forested habitat was still present, we determined that there was a reasonable likelihood that black pinesnake populations may still occur in those areas. If suitable habitat had disappeared in proximity to the record, we made the assumption that although a few individual snakes may still be present, the area likely could no longer support a population capable of persisting long term.

(7) Comment: Three peer reviewers and several other commenters questioned our discussion and assessment relating to the viability of the black pinesnake populations. Two peer reviewers noted we needed to supply numerical values to demonstrate both population viability and minimum reserve area.

Our Response: We do not currently have data (numerical values) on what constitutes a viable population for the black pinesnake and, therefore, have removed any discussion on viability of populations from this final listing rule. As stated in the ''Population Estimates and Status'' section under the Background section, above, we determined that 3 of the 11 currently known populations were not likely to persist in the long term due to their location on fragmented habitat and the lack of any protection or management in place. Viability, particularly with respect to minimum reserve area (minimal acreage necessary to support a viable population), will be discussed in our final critical habitat designation.

Federal Agency Comments

(8) Comment: One Federal agency and many public commenters disagreed with our assessment of the current decline of the longleaf pine ecosystem in the Southeast. These commenters also questioned our statement that increases in longleaf pine forests through restoration efforts in the Southeast do not align with the range of the black pinesnake.

Our Response: See our discussion of longleaf pine habitat under *Factor A: The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.* Although there has been an extensive effort to restore longleaf pine in the Southeast, the

footprint of the longleaf pine ecosystem across its historical range continues to contract, with considerable losses being attributed to the conversion to loblolly pine (Oswalt *et al.* 2015, p. 504). Increases in longleaf pine acreage from restoration efforts do not overlap completely with the range of the black pinesnake (Ware 2014, pers. comm.). Recent outlooks for the southern Gulf region (which includes the range of the black pinesnake) still predict large percentage losses in longleaf pine distribution; in fact, Clarke County, Alabama, and several Mississippi counties occupied by the black pinesnake are predicted to have some of the highest percentages of longleaf pine loss in the Southeast (Klepzig *et al.* 2014, p. 53).

(9) Comment: One Federal agency and many public commenters disagreed that urbanization is still a contributor to habitat loss within the range of the black pinesnake and expressed concern with our forecast on the continued loss of forest land to urbanization over the next 50 years. Commenters stated that our forestry forecast was not adjusted to account for the recent economic collapse and subsequent changes in U.S. timber markets and forecasts.

Our Response: We recognize that not all areas within the range of the black pinesnake are forecast to have the same predicted levels of population growth in the next few decades, and some rural areas may experience population declines. However, we also recognize that many counties within the black pinesnake's range are still forecast to experience increases in urban land use, especially in areas near Mobile, Alabama, that have historically seen drastic habitat loss. We used the Southern Forest Futures Project to develop information in this rule regarding factors that are likely to result in forest changes within the range of the black pinesnake; this analysis covered a number of different scenarios of future population/income growth and timber prices and baseline tree planting rates (Klepzig *et al.* 2014, pg. vi). In all future scenarios, the southern Gulf region (which includes the range of the black pinesnake), as well as all the other southern U.S. subregions, exhibited a strong growth in population (Klepzig *et al.* 2014, pg. 20). See our discussion of longleaf pine habitat under *Factor A: The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.*

(10) Comment: One Federal agency and numerous commenters disagreed that clearcut harvesting (clearcutting) constituted a management activity that destroys black pinesnake habitat. Some public commenters further elaborated that it is the activities occurring prior to the clearcut, or the managed condition after the clearcut, which are the potential threats to habitat. Many public commenters recommended that clearcutting be exempted as an intermediate treatment under the 4(d) rule.

Our Response: We recognize that while some clearcut harvesting may have a negative impact on black pinesnake habitat, at other times it is a necessary management tool to restore a forest to a condition suitable for pinesnakes and other native wildlife. For instance, clearcutting off-site pine species prior to afforestation or reforestation with longleaf pine and clearcutting with longleaf reserves to promote natural regeneration can both be very appropriate for creating and maintaining suitable black pinesnake habitat. Therefore, we removed the specific activity ''clearcutting'' from the list of activities which could potentially result in a violation of Section 9 of the Act. The 4(d) rule identifies activities causing significant subsurface disturbance or the conversion of the native longleaf pine forest to another forest cover type (or agricultural/urban uses) as the specific activities potentially causing take and threatening the subspecies.

(11) Comment: Two Federal agencies, one State agency, and numerous public commenters stated that more data and information were needed before proceeding with a federal listing of the black pinesnake. Commenters noted the lack of demographic data, life-history studies, and current rangewide surveys and population estimates as critical information needed to assess the subspecies' status and population trends. Several others noted that population estimates should be considered a minimum because pinesnakes are difficult to locate given their tendency to remain below ground most of the time, and because most black pinesnake records were the result of incidental observations in the course of other activities or biased based on number of observers frequenting the area.

Our Response: It is often the case that data are limited for rare species, and we acknowledge that it would be useful to have more information on the black pinesnake. However, as required by the Act, we base our determination on the best available scientific and commercial information at the time of our rulemaking. Trend information on population levels and habitat loss/availability or population/habitat indices often represent the best available information upon which to base listing actions. In arriving at our determination that the black pinesnake meets the definition of ''threatened'' under the Act, we note our conclusion is not based on estimates of population size or strictly on observational data, but on the reductions in range and numbers of populations due to past threats, and the negative impact of ongoing threats to those few populations that remain. Observational data (records) were only part of the analysis of population trends, as we evaluated habitat suitability through GIS as part of a probability of occurrence determination (please see our response to Comment 6, above). The Service determined that the available suitable habitat has diminished to the point that many historical populations have been severely reduced and gene flow between surviving populations has been restricted to the point of preventing the natural recovery of the subspecies.

(12) Comment: One Federal agency expressed concern over our statement that activities causing ''ground disturbance'' could potentially result in a violation of take under section 9 of the Act and thereby impact military training or habitat restoration on the Camp Shelby Joint Forces Training Center (Camp Shelby) in Mississippi.

Our Response: Following a review of the comments and our revision of the 4(d) rule, we have clarified the list of potential section 9 violations (see Available Conservation Measures, below). We specifically focused on those activities that may impact the black pinesnake refugia (stump holes), the most important habitat feature for the subspecies, in our development of the list of potential section 9 violations. Therefore, we have replaced ''activities causing ground disturbance'' with a more focused statement of those ''activities causing significant subsurface disturbance.'' We do not believe that normal military training operations will cause significant subsurface disturbance in the forested areas occupied by black pinesnakes, as artillery firing occurs on ranges that are maintained as mowed open fields, and troop- and vehicle-maneuvering activities do not cause significant disturbance that would destroy underground refugia. Habitat restoration and maintenance activities are covered under Camp Shelby's INRMP, which includes specific conservation measures to benefit black pinesnakes, including protection and maintenance of pine stumps (MSARNG 2014, p. 93). Military training operations on Camp Shelby have been compatible with protection measures for the burrows of the gopher

tortoise (*Gopherus polyphemus*), which has been federally listed for 28 years. We believe these operations will be compatible with protecting black pinesnakes and their habitat as well. As we have done with the gopher tortoise, we will work with the Department of Defense (DoD) and Camp Shelby to ensure their military mission can be accomplished and habitat restoration efforts can continue.

Comments From States

Section 4(b)(5)(A)(ii) of the Act requires the Service to give actual notice of any proposed listing regulation to the appropriate agency of each State in which the species is believed to occur, and invite each such agency to comment on the proposed regulation. We received comments from the Alabama Department of Conservation and Natural Resources, Wildlife and Freshwater Fisheries Division (ADCNR); the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP); the Secretary of State for Mississippi; and the Louisiana Department of Wildlife and Fisheries (LDWF). The ADCNR provided an initial comment supporting the listing of the black pinesnake as threatened, which was followed later by a letter rescinding its support for the threatened listing and citing its belief that additional information was needed prior to making a listing decision. The MDWFP noted that it did not support any regulation or listing that would restrict or prohibit private landowners from managing their property for their objectives, specifically timber management. These agencies in Alabama and Mississippi also expressed concern that the 4(d) rule as proposed was too narrow in scope and would negatively impact private landowners managing timber. The LDWF initially commented that it did not consider the black pinesnake extirpated in Louisiana, based on a 2005 reported observation; however, they later retracted this statement. Based on further analysis, LDWF determined that the 2005 report was unverifiable and scientifically invalid; therefore, it failed to meet the criteria as an element of occurrence in the Louisiana Natural Heritage Program database. LDWF also stated that it supported the black pinesnake's proposed listing as threatened with a 4(d) rule to exempt beneficial management practices and noted that Louisiana is continuing to lose suitable upland pine habitat due to urban development. Specific issues raised by the States are addressed below.

(13) Comment: ADCNR and many public commenters stated that the proposed 4(d) rule was overly prescriptive and recommended a 4(d) rule similar to the Louisiana black bear (*Ursus americanus luteolus*) 4(d) rule, which exempts take occurring during all normal forestry activities that do not negatively impact den trees (see 50 CFR 17.40(i)). ADCNR also stated that it would support a 4(d) rule that provides for open canopy conditions; abundant ground cover; and refugia habitat such as stumps, snags, and woody debris.

Our Response: We appreciate the input from ADCNR and other commenters, and have made adjustments to the 4(d) rule to exempt, among other things, all forest management activities that maintain lands in a forested condition, except those activities causing significant subsurface disturbance or converting longleaf pine forests to other forest cover types. This change is in recognition of the naturally decayed or burned-out pine stump holes as an essential habitat feature for the black pinesnake, much like the Louisiana black bear 4(d) rule was developed to protect an essential habitat feature for that species. Not all suggested changes were incorporated because not all activities are consistent with a 4(d) rule that is ''necessary and advisable for the conservation of the species.'' We believe this revised 4(d) rule for the black pinesnake focuses on protecting those habitats and features most important to black pinesnake conservation, and addresses the standards supported by ADCNR. In addition, many forest operations in Alabama and Mississippi may already be operating in a manner consistent with the 4(d) rule. For instance, the language associated with conversion of longleaf pine forests to other forest types is consistent with Sustainable Forestry Initiative guidelines that protect rare and ecologically significant native forests (SFI 2015, p. 4), while some landowners indicated that they did not routinely remove stumps in these habitats.

(14) Comment: One state agency (ADCNR) and many public commenters requested that the comment period be extended for the proposed listing.

Our Response: We consider the two comment periods on the proposed listing, totaling 120 days, to have provided the public a sufficient opportunity for submitting comments. We provided a 60-day comment period associated with the publication of the listing proposed rule, which opened on October 7, 2014 (79 FR 60406), and closed on December 8, 2014. We then reopened the comment period for an additional 60 days on March 11, 2015, in association with our publication of our proposed critical habitat designation for the black pinesnake (80 FR 12846). This second comment period closed on May 11, 2015.

The Act requires the Service to publish a final rule within 1 year from the date we propose to list a species. In order to extend the comment period, we would have risked missing this deadline, unless we sought an extension under section 4(b)(6)(B)(i) of the Act. The Act allows this extension is if there is substantial disagreement regarding the sufficiency or accuracy of the available data relevant to the determination or revision concerned, but only for 6 months and only for purposes of soliciting additional data. Based on the comments we received and data we evaluated, although there are differences in interpretation of the existing data, there is not substantial scientific disagreement regarding the sufficiency or accuracy of the available data. Please also see our response to Comment 11, above.

(15) Comment: MDWFP and many public commenters voiced opposition to any regulations that would prohibit landowners from managing their lands for their objectives with the focus on timber management operations. The Secretary of State for Mississippi and many public commenters expressed concern due to their perception that the proposed 4(d) rule, as written, specifically required landowners to adhere to certain timber management metrics, including placing limitations on harvest size and canopy closure, as well as requiring the planting of only longleaf pine.

Our Response: Throughout the development of this listing rule, we have attempted to describe black pinesnake habitat by characterizing the historical ecosystem in which pinesnakes evolved, and the primary habitat features important to pinesnakes, with data from publications and reports to support the utility of these habitat features. This has been taken by many as a prescription for how all landowners must manage their land from now on; however, in no way is the rule intended to prescribe management conditions. The Service will not require landowners to harvest their timber in a certain way, nor will we restrict landowners from managing loblolly or other pine tree species on their lands.

We will continue to recommend that longleaf pine be the preferred overstory species within the historical longleaf range. While black pinesnake habitat management can be successfully integrated with forestry practices in all pine species, longleaf pine is better suited for many reasons. Longleaf pines have open crowns that allow more

sunlight to reach the ground. The trees can be burned at younger ages and can be managed on longer rotations. Further, longleaf pines are more disease- and insect-resistant when compared to loblolly pines, and more resistant to wind damage due to the deep taproot and smaller crown density.

It should also be noted that densely planted pine plantations are not considered habitat for the black pinesnake, and, therefore, any actions in these stands are unlikely to result in take. In addition, landowners are not required to adhere to the conditions outlined in the 4(d) rule. There is no requirement to follow these voluntary guidelines and landowners who would prefer not to use the exemptions may consult with the Service on their forestry management practices if there is a potential to impact the black pinesnake. No consultation would be needed for forest management activities outside of the known areas occupied by the subspecies.

(16) Comment: ADCNR and many public commenters stated that it is not essential for longleaf pine to be the primary forest cover for an area to be considered black pinesnake habitat and that it is the structure of the forest that is more important. Therefore, longleaf pine should be de-emphasized throughout the rule, and it should not be a requirement to meet the provisions for the 4(d) rule. Consequently, some public commenters maintained that if there is no indication that longleaf pines are a necessary component of black pinesnake habitat, then the assumption that black pinesnake populations have declined proportionately with the decline in longleaf pine forests is invalid.

Our Response: We believe the structure of the forest occupied by black pinesnakes is very important, and we recognize that some studies have shown that pinesnakes have not always been found exclusively using longleaf pine forests, though it should be noted that the need for open-canopy and herbaceous understory has been supported in these studies.

Many forests are not managed to foster open conditions in the understory. Typical pine plantation management (*i.e.,* characterized by high stocking rates), for instance, differs from the conditions favored by this subspecies for several reasons. Pine plantations are not typically maintained in the open-canopied condition with an abundant herbaceous groundcover that is characteristic of the structure of this historical ecosystem. These converted forests differ from the native longleaf pine ecosystem in which the black pinesnake evolved, most noticeably in that they exhibit frequent canopy closure, often use practices that destroy subsurface structure, and have more limitations on how fire may be used as the primary management tool.

Even in cases where loblolly is favored in a more open condition, it does not function in the same way as longleaf over the long term. In fact, the Longleaf Alliance has said, ''The introduction of periodic fire and recovery of groundcover and wildlife communities may be possible without longleaf for the short term. Eventually, however, the fire regime necessary to maintain the desired groundcover and wildlife communities can only be maintained in longleaf pine forests. Treating longleaf pine like loblolly pine will not achieve the desired results'' (Longleaf Alliance 2015, unpaginated). The tree species itself matters because, over time, the fire necessary to maintain the herbaceous groundcover that supports this subspecies is only well-tolerated by longleaf pine. Further, Means (2005, p. 76, and references therein) suggested that longleaf pine is likely to be more important than other southern pine species to animals using stumpholes, because longleaf pine has a more resinous heartwood, deeper taproot, and lateral roots spreading out 50 ft (15.2 m) or more. Therefore, we believe that the decline of the black pinesnake is closely linked to the decline of the characteristic longleaf pine ecosystem.

Typically, if converted forests display an open-canopied condition, it is only temporary, and when the canopy closes that habitat becomes unsuitable for both black pinesnakes and their prey. Occurrence of pinesnakes in these forests should not be confused with preference for those types of habitat. We believe the pinesnakes in converted forests are selecting for the best available sub-optimal habitat, and although they may be persisting sporadically in the modified habitat, once the canopy closes again they will be forced to relocate because there will be no herbaceous groundcover to support prey populations on which the subspecies depends for survival. This has been supported through radio-telemetry data, which show that black pinesnakes most often utilize open-canopied forests (Baxley and Qualls 2009, p. 289).

A long history of removal of subsurface structure (*e.g.,* stumps and root channels) and conversion from native forests to other uses has eliminated both the subspecies and suitable habitat; therefore, it is unlikely that sites that have been intensively managed through multiple rotations or converted to agriculture or urban areas will support populations long term. This is likely because the refugia habitat has been removed, the surface can no longer support prey species, road density and thereby the threat posed by road crossings increases, or simply because the habitat (in any condition, optimal or suboptimal) no longer remains on a site.

Public Comments

General Issue 1: Captive Propagation

(17) Comment: A number of commenters representing the captive breeding community voiced concern over the listing, especially with its impact to pet owners, future sales of black pinesnakes, work of researchers, and zoological institutions. Some specifically requested that captive-bred animals be excluded from the listing or exempted through a 4(d) rule to allow unfettered continuation of captive breeding, pet ownership, and trade.

Our Response: Black pinesnakes acquired before the effective date of the final listing of this subspecies (see **DATES**, above) may be legally held and bred in captivity as long as laws regarding this activity within the State in which they are held are not violated. This would include snakes acquired pre-listing by pet owners, researchers, and zoological institutions. Future sale of captive-bred black pinesnakes, born from pre-listing acquired parents, within their State of their origin would be regulated by applicable laws of that State. If individuals outside the snake's State of origin wish to purchase captive-bred snakes, they would have to first acquire a 10(a)(1)(A) Interstate Commerce permit from the Service (Web site: *http://www.fws.gov/forms/3-200-55.pdf*). Information about the intended purpose of purchasing a black pinesnake is required because using federally threatened species as pets is not consistent with the purposes of the Act, which is intended to support the conservation of species and recovery of wild populations. However, an animal with threatened species status may be legally kept in captivity if it is captive-bred and used for educational and/or breeding purposes consistent with the aforementioned intent of the Act. Through the permit process, we are able to track and monitor the trade in captive-bred listed species. For this reason, we believe exemption for this activity through a 4(d) rule would not be appropriate, as it would not meet the standard of providing for the conservation of the subspecies.

(18) Comment: Several commenters stated that the Service should have taken information relating to the large captive-bred population into the decision to list the subspecies. Several other commenters stated listing was unnecessary because captive-bred animals could be released in the wild.

Our Response: While there have been great advances by snake enthusiasts and hobbyists in successful breeding programs for pinesnakes, they are not animals bred to be returned to wild habitats. The Service views captive propagation programs as a last recourse for conserving species. The Act directs the Service to focus on conserving the ecosystems upon which endangered and threatened species depend. Loss of habitat is one of the primary threats to this subspecies. Before captive animals can be reintroduced, questions of genetics, disease, and survival in the wild must be evaluated, which is generally done in a recovery setting while considering all of the options available for conservation. Captive populations, even when they are healthy and genetically diverse, will likely not survive in the wild without adequate habitat to support the subspecies. As we begin the recovery process, we will consider various options for recovery of the subspecies, which may include captive propagation. If you have interest in participating, please refer to the Available Conservation Measures section, below, for further guidance on participating in this process.

General Issue 2: Forestry Management Practices

(19) Comment: Several commenters representing the forestry industry stated that the Service misunderstands the nature and ecology of modern pine plantations and mistakenly thinks that pine plantations are static ''closed canopies'' and have ''thick mid-stories.'' They stated that pine plantations can provide suitable black pinesnake habitat, and across a broad, actively-managed forest landscape, pine plantations that are at different stages of development ensure that suitable habitat is available at all times. The commenters referred to a 2013 National Council for Air and Stream Improvement (NCASI) report, which states that of the almost 9 million acres of planted pine forests owned by large corporate forest landowners, two-thirds of those acres were in some form of open-canopied condition. The commenters suggested that suitable black pinesnake habitat should include this type of matrix of forested stands where the canopy cover is at various stages of being open and closed, as the pinesnakes would always be able to find areas where they could locate food, shelter, and mates.

Our Response: We sincerely appreciate the efforts of forest landowners to provide habitat for a variety of species and would like to continue working with the forest industry to further explore the benefits of pine plantations. We believe there are several potential issues with depending on a matrix of pine plantations to provide suitable habitat for the subspecies long term; most notably, that not all forests are managed in a way that will protect the subspecies or its habitat. At the time of the survey cited by the commenter, two-thirds of those acres were comprised of young trees that had not grown large enough to close the canopy, as many of those lands go through cycles of having closed canopies. For example, if a stand becomes closed when the trees are 5 to 7 years old, and the first thinning is at age 14 to 20, there is a period of 7 to 15 years when that stand is unsuitable for pinesnakes.

The idea that a matrix of intermittently open- and closed-canopied forest stands provides suitable habitat for black pinesnakes relies on several assumptions, such as that suitable open habitat will always be located in close proximity to areas where the canopy is closing, that areas of suitable habitat will be expansive enough to support the large home ranges of these snakes, and that snakes which must relocate due to canopy closure will be able to find adequate access to relocated mates and prey in their shifted home range. Both Lane *et al.* (2013, p. 231) and Hanberry *et al.* (2013, p. 57) state that small mammal abundance decreases in response to canopy closure, often to the point of mammals abandoning the site. Therefore, stands such as these, although open for a part of the time during the cycle of management and harvesting activities, are not stable habitats for pinesnakes and do not contribute to the long-term conservation of the subspecies. In addition, if incompatible site preparation activities remove subsurface refugia from a site, it is unlikely pinesnakes would have retreat sites within these stands for several years following harvest. This increases the amount of time the subspecies has to spend on the surface vulnerable to predators.

(20) Comment: Commenters disagreed with the Service's characterization that site preparation in a modern pine plantation frequently involves mechanical clearing of downed logs and stumps, greatly reducing the availability of suitable refugia to black pinesnakes.

Our Response: It is likely that activities during site preparation that may greatly reduce the availability of refugia, such as clearing of stumps and other subsurface disturbance, may not occur as commonly now as in previous years, particularly on industrial forest lands, and we have altered the language in this final rule to reflect that. However, because we received comments from many others asking that these mechanical site preparation activities be exempted under the 4(d) rule, we know that they do still occur. These activities must be identified as potential threats because one of the most important features of the habitat for black pinesnakes is the presence and availability of naturally decayed or burned-out pine stump holes in which the snakes spend a large percentage of their time. Although pinesnakes may occasionally use debris piles and other aboveground refugia, it is the subterranean refugia (*i.e.,* stump holes) that are thought to be most important to the subspecies. Those who manage to the standards laid out under the 4(d) rule will be exempted from ''take'' for this subspecies.

General Issue 3: Private Land Issues

(21) Comment: Many public commenters stated that there are insufficient data to determine the effects of the listing on landowners. They expressed concern that the listing will put an economic burden on private landowners and restrict their activities.

Our Response: We understand that there is confusion and concern about the effect of listing the black pinesnake. We acknowledge that some economic impacts are a possible consequence of listing a species under the Act. However, the Act does not allow us to consider such impacts when making a listing decision. Rather, section 4(b)(1)(A) of the Act specifies that listing determinations be made ''solely on the basis of the best scientific and commercial data available.'' Such potential costs are therefore precluded from consideration in association with a listing determination. We are required to consider economic impacts in the decision to designate critical habitat, and have conducted an economic analysis for the proposed critical habitat rule, which is available at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2014–0065.

The Service believes that restrictions alone are neither an effective nor a desirable means for achieving the conservation of listed species. We prefer to work collaboratively with private

landowners. We encourage any landowners with a listed species present on their properties and who think they may conduct activities that negatively impact that species to work with the Service. We can help those landowners determine whether a habitat conservation plan (HCP) or safe harbor agreement (SHA) may be appropriate for their needs. These plans or agreements provide for the conservation of the listed species while providing the landowner with a permit for incidental take of the species during the course of otherwise lawful activities. Furthermore, our 4(d) rule for black pinesnake, which includes exemptions for certain forest management activities, was developed with the intent of maximizing timber management flexibility to landowners while also providing for the conservation of the subspecies. Other voluntary programs, such as the Service's Partners for Fish and Wildlife program and the Natural Resources Conservation Service's Farm Bill programs, offer opportunities for private landowners to enroll their lands and receive cost-sharing and planning assistance to reach their management goals. The conservation and recovery of endangered and threatened species, and the ecosystems upon which they depend, is the ultimate objective of the Act, and the Service recognizes the vital importance of voluntary, nonregulatory conservation measures that provide incentives for landowners in achieving that objective. We are committed to working with landowners to conserve this subspecies and develop workable solutions.

(22) Comment: Several commenters stated that property rights granted by the Constitution preclude the government from preventing landowners from managing property to meet their goals. Landowners should be able to make use of property at their own free will as long as it falls within the current county, State, and Federal regulations.

Our Response: The agency acknowledges the rights granted by the Constitution. Prior court rulings address this concern in more detail. However, Section 9 of the Act makes it illegal for anyone to ''take'' (defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any of these actions) an endangered or threatened species. However, the mere promulgation of a regulation, such as listing a species under the Act, does not prevent landowners from managing their property to meet their goals. As discussed in our response to Comment 21, above, programs are available to private landowners for managing habitat for listed species, as well as permits that can be obtained to protect private landowners from the take prohibition when such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Private landowners may contact their local Service field office to obtain information about these programs and permits.

(23) Comment: Private landowners should be compensated if land use is restricted on their property.

Our Response: There is no provision in the Act to compensate landowners if they have a federally listed species on their property. However, as addressed in our response to Comment 22, above, the private landowners' only obligation is not to ''take'' the subspecies, and many forestry management activities have now been exempted from ''take'' (see 4(d) Rule, below). Also, as mentioned in our response to Comment 21, above, we have a number of programs to provide management guidance and financial assistance to private landowners managing their lands to benefit the recovery of listed species. A number of other Federal agencies and individual States provide financial assistance and similar programs to interested landowners.

(24) Comment: Several commenters stated that no private lands or State lands should be included in the listing.

Our Response: Under the Act, we determine whether a species warrants listing based on our assessment of the five-factor threat analysis using the best available scientific and commercial information; land ownership is not a consideration in that determination. The action of listing a species provides protection for the species wherever it occurs. Protection for lands essential to the conservation of a listed species is covered under a designation of critical habitat and is not a part of this listing rule. A proposed rule to designate critical habitat for the black pinesnake was published separately on March 11, 2015 (80 FR 12846), and comments regarding that proposal will be addressed in the final critical habitat determination and if appropriate, the designation.

(25) Comment: Several commenters noted that the continuous threat of species listings and designations of critical habitat will be a disincentive for landowners to participate in longleaf pine restoration efforts, may encourage more landowners to grow a monoculture of loblolly, or may encourage more landowners to abandon forest ownership and management.

Our Response: We acknowledge and commend landowners for their land stewardship and want to continue to encourage those management practices that support the black pinesnake. Under the Act, we have an obligation to assess threats to species and, if appropriate, provide for their protection. We have no desire to limit private landowners' ability to provide habitat for these imperiled species; in fact, we have a number of financial incentives through our Private Lands program to help private landowners manage their properties for endangered and threatened species. Continuation of longleaf pine restoration efforts across the subspecies' range will be necessary for conservation and recovery of this subspecies and many other species. We have reviewed all the comments we received from forest stakeholders and have used them to refine the 4(d) rule and improve the balance of activities that would promote conservation of the black pinesnake and its habitat and not unnecessarily burden private landowners. Please see also our responses to Comments 21 and 23, above.

General Issue 4: Science

(26) Comment: Several commented that the Service is using any scientific and commercial data available and not necessarily the best available. They further stated that the Service did not undertake efforts to fill the data gaps concerning life history, habitat, and status of the black pinesnake and have put the burden on private landowners to provide commercial and scientific data rebutting the data advanced by the Service.

Our Response: No new data were provided by these commenters to support this statement, although some have offered different interpretations of the existing data. We have used the best scientific and commercial data available to finalize our determination of threatened status for the black pinesnake. Furthermore, our analysis is supported by our peer reviewers. Please also see our responses to Comments 11 and 14, above.

(27) Comment: One commenter stated that the sightings of black pinesnakes in Alabama in the mid-1990s were reported by individuals that were not biologists or herpetologists, so these records cannot be ''scientific data.''

Our Response: All Alabama records for the black pinesnake are either from the Alabama Natural Heritage Program's databases or from reputable herpetologists. Heritage data are automatically accepted by the Service as valid due to the strict criteria for their acceptance as scientific records. Although the descriptive data (observer, date, coordinates, condition of the

animal) were not always recorded at a consistent level of detail in some of the older records, we scrutinized all reputable location data to differentiate between separate pinesnake observations.

General Issue 5: Procedural/Legal Issues

(28) Comment: One commenter stated that the Service should not use information that is not peer-reviewed in listing determinations.

Our Response: The Act and our regulations do not require us to use only peer-reviewed literature, but instead they require us to use the ''best scientific data available'' in a listing decision. Our Policy on Information Standards under the Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines (*http://www.fws.gov/informationquality/*), provide criteria and guidance, and establish procedures to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to list a species. Primary or original information sources are those that are closest to the subject being studied, as opposed to those that cite, comment on, or build upon primary sources. In making our listing decisions, we use information from many different sources, including articles in peer-reviewed journals, scientific status surveys and studies completed by qualified individuals, other unpublished governmental and nongovernmental reports, reports prepared by industry, personal communication about management or other relevant topics, management plans developed by Federal agencies or the States, biological assessments, other unpublished materials, experts' opinions or personal knowledge, and other sources. In finalizing this listing determination, we have relied on published articles, unpublished research, habitat reports, digital data publicly available on the Internet, and the expert opinions of subject biologists.

That said, in accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited peer review from knowledgeable individuals with scientific expertise that included familiarity with this subspecies and other pinesnakes, the geographic region in which the subspecies occurs, and conservation biology principles. Additionally, we requested comments or information from other concerned governmental agencies, the scientific community, industry, and any other interested parties concerning the proposed rule. Comments and information we received helped inform this final rule.

(29) Comment: Several commenters stated that because the proposed rule arose from the Service's settlement of a lawsuit, the Service is indirectly encouraged to list the subspecies, or avoid any delays in listing, even though such delays might result in a more scientifically sound analysis of the subspecies.

Our Response: Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. We adhered to the requirements of the Act to determine whether a species warrants listing based on our assessment of the five-factor threats analysis using the best available scientific and commercial data (see Summary of Factors Affecting the Species, below). We had already determined, prior to the settlement agreement, that the black pinesnake warranted listing under the Act, but listing had been precluded by the necessity to commit limited funds and staff to complete higher priority species actions. The black pinesnake has been included in our annual candidate notices of review since 1999, during which time scientific literature and data have and continue to indicate that the subspecies is detrimentally impacted by ongoing threats, and we continued to find that listing was warranted but precluded. Thus, the listing process is not arbitrary, but uses the best available scientific and commercial data and peer review to ensure sound science and sound decision-making.

(30) Comment: Several commented that the Service should not list another species in Alabama because the Service is unable to fulfill various mandated obligations with respect to other species already listed (*i.e.,* timely recovery plans, 5-year reviews)

Our Response: The listing of a species is based on an analysis of threats according to the Act (see Determination section, below). The Act does not allow the Service to delay listing of new species until the Service has completed certain actions, such as recovery plans and 5-year reviews, for other previously listed species.

(31) Comment: Several comments stated that our proposed rule denied potentially affected landowners due process in that all landowners were not provided actual notice of this rulemaking.

Our Response: In the proposed listing rule published on October 7, 2014 (79 FR 60406), we requested that all interested parties submit written comments on the proposal by December 8, 2014. We reopened the comment period on the listing proposal on March 11, 2015 (80 FR 12846) with our publication of a proposed critical habitat designation for the subspecies. This second 60-day comment period ended on May 11, 2015. During both comment periods, we also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Newspaper notices inviting general public comment were published in the Mobile Press Register and Hattiesburg American on October 12, 2014, and again on March 15, 2015. We also presented several webinars on the proposed listing and critical habitat rules, and invited all stakeholders, media, and congressional representatives to participate and ask any questions. The webinar information was posted on our Web site along with copies of the proposed listing rule, press release, and a question/answer document. As such, we have met our obligations under the Act with regard to notification concerning the proposed listing.

General Issue 6: Other

(32) Comment: Several commented that existing State regulations are adequate to protect the black pinesnake. A Federal listing would only duplicate existing protection because it is illegal to kill the snakes.

Our Response: Section 4(b)(1)(A) of the Act requires us, in making a listing determination, to take into account those efforts being made by a State or foreign nation, or any political subdivision of the State or foreign nation, to protect the species. Under Factor D in the proposed and final rules to list the subspecies, we provide an analysis of the existing regulatory mechanisms. In that analysis, we consider relevant Federal, State, and tribal laws and regulations. Regulatory mechanisms may negate the need for listing if we determine such mechanisms address the threat to the species such that listing is not, or no longer, warranted. However, for the black pinesnake, the best available information supports our determination that State regulations are not adequate to remove the threats to the point that listing is not warranted. Existing State

regulations, while providing some protection for individual snakes, do not provide any protection for their habitat (see Summary of Factors Affecting the Species, *Factor D* discussion). Loss of habitat has been a primary driver of the subspecies' decline. The Act provides habitat protection for listed species both through section 7 and the designation of critical habitat. In addition, listing provides resources under Federal programs to facilitate restoration of habitat, and helps bring public awareness to the plight of the species.

(33) Comment: One commenter stated that the Service should delay listing and work with other State and Federal agencies and with private landowners to develop prescribed burning programs to improve habitat and reverse the trend of decline of the black pinesnake, as it is largely due to the lack of fire in the woods.

Our Response: We acknowledge that the absence of prescribed burning has contributed to the degradation of the black pinesnake's habitat and the decline of the longleaf pine ecosystem. The Service has made the determination that the black pinesnake is likely to become endangered in the foreseeable future and that listing is warranted after an analysis of the five threat factors under the Act. There is no provision in the Act that would allow us to decline to list a species once that determination has been made. Furthermore, as discussed in our response to Comment 14, the criteria for delaying our listing decision have not been met. As discussed above in our response to Comment 21, we have a number of programs that provide assistance and financial incentives to private landowners to increase the use of fire as a management tool, and we will continue to actively pursue ways to work with the public and partners to reverse the decline of the black pinesnake and its habitat.

(34) Comment: Several commenters stated that endangered species protection is more effectively achieved by allowing forest landowners to continue to manage their land under voluntary best management practices or by providing incentives to landowners to initiate longleaf pine management. Landowners and groups like Longleaf Alliance and American Forest Foundation encourage landowners to return to longleaf pine and to manage with fire, thinning, and harvesting, all of which enhances black pinesnake habitat. Regulations through listing would serve to further deter cooperative management between public agencies and landowners.

Our Response: We recognize that the black pinesnake remains primarily on lands where habitat management has allowed them to survive, due in large part to voluntary actions incorporating good land-stewardship, and we want to encourage management practices that support the subspecies. However, the Service, in conducting its assessment of the status of the black pinesnake according to standards in the Act, has determined that certain forest management practices have contributed to the subspecies' decline. In order to protect the black pinesnake from continued decline, and because we have determined that it is likely to become endangered in the foreseeable future, we are listing the subspecies as threatened. We do recognize the contributions of forest landowners and have exempted from take a number of forest management activities under the 4(d) rule. We maintain that the best chance for conservation and, ultimately, the recovery of the subspecies will require the protections afforded by listing, as well as voluntary conservation measures undertaken by private landowners, with support from the States and conservation organizations. We, and other Federal and State agencies, have a number of existing programs that provide incentives to private landowners to initiate longleaf pine management (*e.g.,* Working Lands for Wildlife, Conservation Reserve Program). We will continue to work with the public through these programs to benefit the black pinesnake as we have done for other longleaf pine endemics such as the threatened gopher tortoise and endangered red-cockaded woodpecker (*Picoides borealis*) and dusky gopher frog (*Rana sevosa*).

(35) Comment: Several commenters asserted that because the proposed rule was opposed by the ADCNR and Alabama Forestry Association (AFA), which have expertise with the subspecies and Alabama forests, that the Service should not ignore ADCNR's admonitions to gather further information before proceeding with a listing decision.

Our Response: We acknowledge and value the expertise of the ADCNR and the AFA. We fully respect the position of the State, even when we do not entirely agree on their interpretation of the data. The Service is required to make a determination based on the best available scientific information, and after reviewing the comments presented by ADCNR and AFA, as well as all other comments we received, we believe that the information warrants a final listing determination as threatened for the black pinesnake. ADCNR stated that it supported a 4(d) rule that provides for open canopy conditions; abundant ground cover; and refugia habitat such as stumps, snags, and woody debris, and we believe our 4(d) rule in this final listing determination is consistent with that recommendation.

(36) Comment: One commenter questioned why the black pinesnake needed Federal listing as it occurs in the range of other listed species.

Our Response: The current range of the black pinesnake overlaps with several other longleaf pine endemics that are federally listed including the gopher tortoise, red-cockaded woodpecker, and dusky gopher frog. The black pinesnake likely receives benefit from longleaf pine restoration efforts and other recovery actions implemented for these listed species, as some threats to the black pinesnake are similar to other listed species in its range. However, there are aspects of black pinesnake habitat that are unique to them, specifically their use of and need for belowground habitat, such as stump holes, which are not required by these other listed species.

Any ongoing conservation actions and the manner in which they are helping to ameliorate threats to the subspecies were considered in our final listing determination for the black pinesnake (see ''Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range'' under *Factor A,* below). Our determination is guided by the Act and its implementing regulations, considering the five listing factors and using the best available scientific and commercial information. Our analysis supported our determination of threatened status for this subspecies.

(37) Comment: Several commenters questioned why the subspecies should be listed if the most important areas are already being protected and managed. Another commenter stated that the vast acres of public lands that exist within the range of the black pinesnake should be enough to ensure the subspecies continues to persist.

Our Response: Conservation of the black pinesnake will require collaboration between Federal, State, and local agencies wherever the subspecies occurs. About half of the known black pinesnake populations occur primarily on public lands that are typically managed to protect longleaf pine habitat, and management efforts are ongoing on these public lands that benefit the black pinesnake; however, these efforts do not always meet all of the ecological needs of the subspecies (see Comment 36, above). We consider the populations occupying the De Soto

NF in Mississippi as representing the core of the subspecies' range, and these public lands are very important for the conservation and recovery of the black pinesnake, but Federal lands alone are insufficient to conserve the subspecies. These areas represent only a small fraction of the current range of the subspecies. Populations on the periphery of the range have high conservation value as well in terms of maintaining the subspecies' genetic integrity, representing future conservation strongholds, providing future opportunities for population connectivity and augmentation, and contributing to important ecosystem functions in the ecological communities where they occur (see also ''Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range'' under *Factor A,* below).

(38) Comment: One individual commented that we should exempt activities conducted with cost-share funding sources under the 4(d) rule. This would include sources such as the Service's Partners for Fish and Wildlife Program (PFW) and the Natural Resource Conservation Service's Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), and Wildlife Habitat Incentives Program (WHIP).

Our Response: The primary requirement for activities to qualify for exemption under section 4(d) of the Act is that they must be necessary and advisable to provide for the conservation of the species. These programs play an incredibly valuable role in conservation by providing assistance to private landowners to manage their lands. However, there is also a high level of variability among cost-share programs in terms of their primary conservation and management objectives, which makes it difficult to determine definitively which programs would always be beneficial to black pinesnakes. Therefore, we chose to concentrate on the forestry and management activities beneficial to pinesnakes for exemption, instead of the individual programs.

Summary of Changes From the Proposed Rule

Based upon our review of the public comments, comments from other Federal and State agencies, peer review comments, and other new relevant information that has become available since the publication of the proposal, we reevaluated our proposed rule and made changes as appropriate. During the comment periods, the Service received clarifications and additional information on habitat, threats, the subspecies' biology, and timber management practices, which have been incorporated into this final rule. We have removed our discussion relating to the development of a candidate conservation agreement (CCA) for the black pinesnake between the Service and the U.S. Forest Service, U.S. Department of Defense, the Mississippi Army National Guard (MSARNG), and the Mississippi Department of Wildlife, Fisheries, and Parks because it was never finalized. However, the conservation measures outlined in the draft CCA were incorporated into the MSARNG's 2014 updated integrated natural resources management plan (see ''Conservation Efforts to Reduce Habitat Destruction, Modification, or Curtailment of Its Range'' under **Summary of Factors Affecting the Species**). We have also made the following significant changes to the 4(d) rule:

- We have provided clarification to take exemptions regarding prescribed burning and invasive species and vegetation control.
- We have removed the take exemption for ''restoration along riparian areas and stream buffers'' as there is no need to exempt these activities because these areas are not considered habitat for the subspecies, and, therefore, activities associated with their restoration are unlikely to result in take or promote conservation of this subspecies. Any observations of black pinesnakes in riparian areas are incidental to individuals moving between areas of suitable habitat, typically uplands.
- We have broadened the scope of timber management activities exempted from take to include all forest management activities that maintain lands in a forested condition, except for conversion of longleaf-pine-dominated forests to other cover types or land uses, or those activities causing significant subsurface disturbance to the underground refugia for the black pinesnake.
- We have removed the requirement that silvicultural treatments exempted from take be performed under a management plan or prescription toward target conditions for optimal longleaf pine forest. Our revised 4(d) rule allows for the management of other open-canopied pine species.

We have modified the list of actions that may result in take under section 9 in light of modifications made to the exemptions in the 4(d) rule, with the focus on protecting this subspecies' underground refugia.

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species based on (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination.

Factor A: The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Fire-maintained southern pine ecosystems, particularly the longleaf pine ecosystem, have declined dramatically across the South. Current estimates show that the longleaf pine forest type has declined 96 percent from the historical estimate of 88 million ac (35.6 million ha) to approximately 3.3 million ac (1.3 million ha) (Oswalt *et al.* 2012, p. 13). During the latter half of the 20th century, Louisiana, Alabama, and Mississippi lost between 60 and 90 percent of their longleaf acreage (Outcalt and Sheffield 1996, pp. 1–10). Recently, longleaf acreage has been trending upward in parts of the Southeast through restoration efforts; however, the footprint of the longleaf pine ecosystem across its historical range continues to contract, primarily due to conversion to loblolly pine (Oswalt *et al.* 2015, p. 504). Additionally, increases in longleaf pine acreage across the Southeast from longleaf restoration efforts do not overlap completely with the range of the black pinesnake (Ware 2014, pers. comm.); recent outlooks for the southern Gulf region still predict large percentage losses in longleaf pine in many of the areas currently occupied by the subspecies (Klepzig *et al.* 2014, p. 53). Southern forest futures models predict declines of forest land area between 2 and 10 percent in the next 50 years, with loss of private forest land to urbanization accounting for most of these declines (Wear and Greis 2013, p. 78).

Natural longleaf pine forests, which are characterized by a high, open canopy and shallow litter and duff layers, have evolved to be maintained by frequent, low-intensity fires, which

in turn restrict a woody midstory, and promote the flowering and seed production of fire-stimulated groundcover plants (Oswalt *et al.* 2012, pp. 2–3). Although there are records of black pinesnakes occurring in open-canopied forests with overstories of loblolly, slash, and other pines, they are historically associated with the natural longleaf pine forests, which have the abundant herbaceous groundcover (Duran 1998a, p. 11; Baxley *et* al. 2011, p. 161; Smith 2011, pp. 86, 100) necessary to support the black pinesnake's prey base (Miller and Miller 2005, p. 202).

The current and historical range of the black pinesnake is highly correlated with the current and historical range of these natural longleaf pine forests, leading to the hypothesis that black pinesnake populations, once contiguous throughout these forests in Alabama, Mississippi, and southeast Louisiana, have declined proportionately with the ecosystem (Duran and Givens 2001, pp. 2–3). In the range of the black pinesnake, longleaf pine is now largely confined to isolated patches on private land and larger parcels on public lands. Black pinesnake habitat has been eliminated through land use conversions, primarily conversion to agriculture and densely stocked pine plantations and development of urban areas. Most of the remaining patches of longleaf pine on private land within the range of the snake are fragmented, degraded, second-growth forests (see discussion under *Factor E: Other Natural or Manmade Factors Affecting Its Continued Existence*).

Conversion of longleaf pine forests to densely stocked pine plantations often reduces the quality and suitability of a site for black pinesnakes. Duran (1998b, p. 31) found that black pinesnakes prefer the typical characteristics of the longleaf pine ecosystem, such as open canopies, reduced mid-stories, and dense herbaceous understories. He also found that these snakes are frequently underground in rotting pine stumps. Some pine plantations have closed canopies and thick mid-stories with limited herbaceous understories during portions of the timber rotation. Site preparation for planting of pine plantations sometimes involves clearing of downed logs and stumps, thereby interfering with the natural development of stump holes and root channels through decay or from burning, and greatly reducing the availability of suitable refugia (Rudolph *et al.* 2007, p. 563). This could have negative consequences if the pinesnakes are no longer able to locate a previous year's refugium, and are subject to overexposure from thermal extremes or elevated predation risk while the snakes are above ground searching for suitable shelter. Black pinesnakes have persisted in those areas of pine forest, composed of both longleaf pine and other pine species, where the forest structure approximates that which occurred historically in longleaf pine forests, as described above. However, conservation of black pinesnakes requires the long-term availability of these forest structure habitat features, not just in the landscape, but within the subspecies' activity range. If they are required to move from area to area with the change in habitat conditions, as would likely occur on a pine plantation, their fitness and long-term survival will be in question (Yager *et al.* 2006, pp. 34–36).

When a site is converted to agriculture, all vegetation is cleared and underground refugia are destroyed during soil disking and compaction. Forest management strategies, such as fire suppression (see discussion under *Factor E: Other Natural or Manmade Factors Affecting Its Continued Existence*), increased stocking densities, densely planting off-site pine species (*i.e.,* slash and loblolly pines), bedding, and removal of whole trees during harvesting (including downed trees and stumps), all contribute to degradation of habitat attributes preferred by black pinesnakes. It is likely that the diminishing presence and distribution of decaying stump holes and their associated rotting root channels may be a feature that limits the abundance of black pinesnakes within their range (Baxley 2007, p. 44).

Baxley *et al.* (2011, pp. 162–163) compared habitat at recent (post-1987) and historical (pre-1987) black pinesnake localities. She found that sites recently occupied by black pinesnakes were characterized by significantly less canopy cover; lower basal area; less midstory cover; greater percentages of grass, bare soil, and forbs in the groundcover; less shrubs and litter in the groundcover; and a more recent burn history than currently unoccupied, historical sites. At the landscape level, black pinesnakes selected upland pine forests that lacked cultivated crops, pasture and hay fields, developed areas, and roads (Baxley *et al.* 2011, p. 154). Thus, areas historically occupied by black pinesnakes are becoming unsuitable at both the landscape and microhabitat (small-scale habitat component) levels (Baxley *et al.* 2011, p. 164).

Degradation and loss of longleaf pine habitat (*e.g.,* sandy, well-drained soils with an open-canopied overstory of longleaf pine, a reduced shrub layer, and a dense herbaceous ground cover) within the range of the black pinesnake is continuing. The coastal counties of southern Mississippi and Mobile County, Alabama, are being developed at a rapid rate due to increases in the human population. While forecast models show that Federal forest land will remain relatively unchanged overall in the next few decades, projected losses in forest land are highest in the South, with declines in private forest land from urbanization accounting for most of the loss (Wear 2011, p. 31).

Habitat fragmentation within the longleaf pine ecosystem threatens the continued existence of all black pinesnake populations, particularly those on private lands. This is frequently the result of urban development, conversion of longleaf pine sites to densely stocked pine plantations, and the associated increases in number of roads. When patches of available habitat become separated beyond the dispersal range of a species, populations are more sensitive to genetic, demographic, and environmental variability, and extinction becomes possible. This is likely a primary cause for the extirpation of the black pinesnake in Louisiana and the subspecies' contracted range in Alabama and Mississippi (Duran and Givens 2001, pp. 22–26).

Private landowners hold more than 86 percent of forests in the South and produce nearly all of the forest investment and timber harvesting in the region (Wear and Greis 2013, p. 103). Forecasts indicate a loss of 11 to 23 million ac (4.5 million to 9.3 million ha) of private forest land in the South by 2060. This loss, combined with expanding urbanization in many areas and ongoing splitting of land ownership as estates are divided, will result in increased fragmentation of remaining forest holdings (Wear and Greis 2013, p. 119). This assessment of continued future fragmentation throughout the range of the black pinesnake, coupled with the assumption that large home range size increases extinction vulnerability, emphasizes the importance of conserving and managing large tracts of contiguous habitat to protect the black pinesnake (Baxley 2007, p. 65). This is in agreement with other studies of large, wide-ranging snake species sensitive to landscape fragmentation (Hoss *et al.* 2010; Breininger *et al.* 2012). When factors influencing the home range sizes of the threatened eastern indigo snake (*Drymarchon corais couperi*) were analyzed, the results suggested that

maintaining populations of this subspecies will require large conservation areas with minimum fragmentation (Breininger *et al.* 2011, pp. 484–490).

Impacts from urbanization are not consistent throughout the Southeast, and some parts of Mississippi and Alabama may actually experience human population declines (Wear and Greis 2013, p. 21); however, the most recent assessment still predicts increased change in urban land use in the next 45 years in most of the counties occupied by the black pinesnake (Klepzig *et al.* 2014, p. 23). Urbanization appears to have reduced historical black pinesnake populations in Mobile County by approximately 50 percent (Duran 1998a, p. 17), to the point where pinesnakes are thought to be extirpated from some areas directly surrounding Mobile (Nelson and Bailey 2004, p. 44). Substantial population declines were noted throughout the 1970s and 1980s (Mount 1986, p. 35). Jennings and Fritts (1983, p. 8) reported that, in the 1980s, the black pinesnake was one of the most frequently encountered snakes on the Environmental Studies Center (Center) in Mobile County. Urban development has now engulfed lands adjacent to the Center, and black pinesnakes are thought to likely have been extirpated from the property (Duran 1998a, p. 10). Black pinesnakes were commonly seen in the 1970s on the campus of the University of South Alabama in western Mobile; however, there have not been any observations in at least the past 25 years (Nelson 2014, p. 1).

Populations on the periphery of the range have conservation value in terms of maintaining the subspecies' genetic integrity (*i.e.,* maintaining the existing genetic diversity still inherent in populations that have not interbred in hundreds or thousands of years), providing future opportunities for population connectivity and augmentation, and contributing to important ecosystem functions (such as maintaining rodent populations) in the ecological communities where they occur (Steen and Barrett 2015, p. 1). Many of the populations on the edge of the range are smaller, which increases their susceptibility to localized extinction from catastrophic and stochastic events, subsequently causing further restriction of the subspecies' range. Additionally, the footprint of longleaf pine in the Southeast has gone through substantial contraction recently (Oswalt *et al.* 2015, p. 504), creating even higher susceptibility for these peripheral populations. Although the black pinesnake was thought to be fairly common in parts of south Alabama as recently as 30 years ago, we believe many populations have disappeared or drastically declined due to continued habitat loss and fragmentation. For instance, several sites where snakes have been captured historically are now developed and no longer contain habitat.

Conservation Efforts To Reduce Habitat Destruction, Modification, or Curtailment of Its Range

When considering whether or not to list a species under the Act, we must identify existing conservation efforts and their effect on the species.

The largest known populations of black pinesnakes (5 of 11) occur in the De Soto NF, which is considered the core of the subspecies' known range. The black pinesnake likely receives benefit from longleaf pine restoration efforts, including prescribed fire, implemented by the U.S. Forest Service in accordance with its Forest Plan, in habitats for the federally listed gopher tortoise, dusky gopher frog, and red-cockaded woodpecker. (USDA 2014, pp. 60–65). Within the recently revised Forest Plan, black pinesnakes are included on lists of species dependent on fire to maintain habitat, species sensitive to recreational traffic, species that are stump and stump-hole associates, and species sensitive to soil disturbance (USDA 2014, Appendix G–85, G–92, G–100). The management strategies described within the Forest Plan provide general guidance that states project areas should be reviewed to determine if such species do occur and if so to develop mitigation measures to ensure sustainability of the species, such as, in general, not removing dead and downed logs or other woody debris from rare communities.

The MSARNG updated its INRMP in 2014, and outlined conservation measures to be implemented specifically for the black pinesnake on lands owned by the DoD and the State of Mississippi on Camp Shelby. Planned conservation measures include: Supporting research and surveys on the subspecies; habitat management specifically targeting the black pinesnake, such as retention of pine stumps and prescribed burning; and educational programs for users of the training center to minimize negative impacts of vehicular mortality on wildlife (MSARNG 2014, pp. 93–94). However, the INRMP addresses integrative management and conservation measures only on the lands owned and managed by DoD and the State of Mississippi (15,195 ac (6,149 ha)), which make up approximately 10 percent of the total acreage of Camp Shelby (132,195 ac (53,497 ha)). Most of this land is leased to DoD and owned by the Forest Service, which manages the land in accordance with its Forest Plan (see explanation above). Only 5,735 ac (2,321 ha) of the acreage covered by the INRMP provides habitat for the black pinesnake.

Longleaf pine habitat restoration projects have been conducted on selected private lands within the range historically occupied by the black pinesnake and likely provide benefits to the subspecies (U.S. Fish and Wildlife Service 2012, pp. 12–13). Additionally, restoration projects have been conducted on wildlife management areas (WMAs) (Marion County WMA in Mississippi; Scotch, Fred T. Stimpson, and the area formerly classified as the Boykin WMAs in Alabama) occupied by or within the range of the black pinesnake, and on three gopher tortoise relocation areas in Mobile County, Alabama. The gopher tortoise relocation areas are managed for the open-canopied, upland longleaf pine habitat used by both gopher tortoises and black pinesnakes, and there have been recent records of black pinesnakes on the properties; however, the managed areas are all less than 700 ac (283 ha) and primarily surrounded by urban areas with incompatible habitat. Therefore, we do not believe they would provide sufficient area to support a black pinesnake population long term. Furthermore, although there is beneficial habitat management occurring on some of these WMAs and on the tortoise relocation areas, these efforts do not currently target the retention or restoration of black pinesnake habitat, which would include management targeted to maintain larger, unfragmented tracts of open longleaf habitat. Stump removal still occurs within the range of the subspecies and is particularly problematic as it removes refugia habitat for the subspecies. We will continue to work with our State and private partners to encourage the incorporation of these practices, where appropriate.

Summary of Factor A

In summary, the loss and degradation of habitat was a significant historical threat, and remains a current threat, to the black pinesnake. The historical loss of habitat within the longleaf pine ecosystem occupied by black pinesnakes occurred primarily due to timber harvest and subsequent conversion of pine forests to agriculture, residential development, and intensively managed pine plantations. This loss of habitat has slowed

considerably in recent years, in part due to efforts to restore the longleaf pine ecosystem in the Southeast. However, habitat loss is continuing today due to due to incompatible forestry practices, conversion to agriculture, and urbanization, which result in increasing habitat fragmentation (see discussion under *Factor E: Other Natural or Manmade Factors Affecting Its Continued Existence*). While the use of prescribed fire for habitat management and more compatible site preparation has seen increased emphasis in recent years, expanded urbanization, fragmentation, and regulatory constraints will continue to restrict the use of fire and cause further habitat degradation (Wear and Greis 2013, p. 509). Conservation efforts are implemented or planned that should help maintain black pinesnake habitat on Camp Shelby and the De Soto NF; however, these areas represent a small fraction of the current range of the subspecies.

Impacts from urbanization are not consistent throughout the Southeast, and some parts of Mississippi and Alabama may actually experience human population declines (Wear and Greis 2013, p. 21); however, the most recent assessment still predicts increased change in urban land use in the next 45 years in most of the counties occupied by the subspecies (Klepzig *et al.* 2014, p. 23). Smaller populations on the edge of the range are more susceptible to localized extinction from catastrophic and stochastic events. Additionally, the footprint of longleaf pine in the Southeast has gone through substantial contraction recently (Oswalt *et al.* 2015, p. 504), creating even higher susceptibility for these peripheral populations. Thus, habitat loss and continuing degradation of the black pinesnake's habitat remains a significant threat to this subspecies' continued existence.

Factor B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Although there is some indication that collection for the pet trade may have been a problem (Duran 1998a, p. 15), and that localized accounts of a thriving pet trade for pinesnakes have been reported previously around Mobile, Alabama (Vandeventer and Young 1989, p. 34), direct take of black pinesnakes for recreational, scientific, or educational purposes is not currently considered to be a significant threat. This overutilization would be almost exclusively to meet the demand from snake enthusiasts and hobbyists; however, the pet trade is currently saturated with captive-bred black pinesnakes (Vandeventer *in litt.* 2014). The need for the collection of wild specimens is thought to have declined dramatically from the levels previously observed in the 1960s and 1970s (Vandeventer *in litt.* 2014). Though concern has been expressed that Federal listing may increase the demand for wild-caught animals (McNabb *in litt.* 2014), based on current information we have determined that overutilization for commercial, recreational, scientific, or educational purposes is not a threat to the black pinesnake at this time.

Factor C: Disease or Predation

Snake fungal disease (SFD) is an emerging disease in certain populations of wild snakes, though specific pathological criteria for the disease have not yet been established. The disease has been linked to mortality events for other species, but has not yet been documented in *Pituophis* or in any of the States within the range of the black pinesnake. While it is suspected of threatening small, isolated populations of susceptible snake species, we currently have no evidence it is affecting the black pinesnake. We know of no other diseases that are affecting the subspecies, and, therefore, disease is not presently considered a threat to the black pinesnake.

Red imported fire ants (*Solenopsis invicta*), an invasive species, have been implicated in trap mortalities of black pinesnakes during field studies (Baxley 2007, p. 17). They are also potential predators of black pinesnake eggs, especially in disturbed areas (Todd *et al.* 2008, p. 544), and have been documented predating snake eggs under experimental conditions (Diffie *et al.* 2010, p. 294). In 2010 and 2011, trapping for black pinesnakes was conducted in several areas that were expected to support the subspecies; no black pinesnakes were found, but high densities of fire ants were reported (Smith 2011, pp. 44–45). However, the severity and magnitude of effects, as well as the long-term effects, of fire ants on black pinesnake populations are currently unknown.

Other potential predators of pinesnakes include red-tailed hawks, raccoons, skunks, red foxes, and feral cats (Ernst and Ernst 2003, p. 284; Yager *et al.* 2006, p. 34). Lyman *et al.* (2007, p. 39) reported an attack on a black pinesnake by a stray domestic dog, which resulted in the snake's death. Several of these mammalian predators are anthropogenically enhanced (urban predators); that is, their numbers often increase with human development adjacent to natural areas (Fischer *et al.* 2012, pp. 810–811). However, the severity and magnitude of predation by these species are unknown.

In summary, disease is not considered to be a threat to the black pinesnake at this time. However, predation by fire ants and urban predators may represent a threat to the black pinesnake.

Factor D: The Inadequacy of Existing Regulatory Mechanisms

In Mississippi, the black pinesnake is classified as endangered by the Mississippi Department of Wildlife, Fisheries and Parks (Mississippi Museum of Natural Science 2001, p. 1). In Alabama, the pine snake (*Pituophis melanoleucus* spp.) is protected as a non-game animal (Alabama Department of Conservation and Natural Resources 2014, p. 1), and in the 2015 draft of the Alabama Comprehensive Wildlife Conservation Strategy, the black pinesnake is identified as a Priority 1, Species of Greatest Conservation Need (ADCNR 2015, p. 297). In Louisiana, the black pinesnake is considered extirpated (Louisiana Department of Wildlife and Fisheries (LDWF) 2014, p. 2; Anthony *in litt.* 2015); however, Louisiana Revised Statutes for Wildlife and Fisheries were recently amended to prohibit killing black pinesnakes or removing them from the wild without a permit from the LDWF (Louisiana Administrative Code, 2014, p. 186), should they be found in the State again. Both Mississippi and Alabama have regulations that restrict collecting, killing, or selling of the subspecies, but do not have regulations addressing habitat loss, which has been the primary cause of decline of this subspecies.

Where the subspecies co-occurs with species already listed under the Act, the black pinesnake likely receives ancillary benefits from the protective measures for the already listed species, including the gopher tortoise, dusky gopher frog, and red-cockaded woodpecker.

The largest known expanses of suitable habitat for the black pinesnake are in the De Soto NF in Mississippi. The black pinesnake's habitat is afforded some protection under the National Forest Management Act (NFMA; 16 U.S.C. 1600 *et seq.*) where it occurs on lands managed by the Forest Service that are occupied by federally listed species such as the gopher tortoise and red-cockaded woodpecker. Forest Service rules and guidelines implementing NFMA require land management plans that include provisions supporting recovery of endangered and threatened species. As a result, land managers on the De Soto NF have conducted management actions, such as prescribed burning and

longleaf pine restoration, which benefit gopher tortoises, red-cockaded woodpeckers, and black pinesnakes. Within the recently revised Forest Plan, black pinesnakes are included on lists of species dependent on fire to maintain habitat, species sensitive to recreational traffic, species that are stump and stump-hole associates, and species sensitive to soil disturbance (USDA 2014, Appendix G–85, G–92, G–100). The management strategies described within the Forest Plan provide general guidance that states project areas should be reviewed to determine if such species do occur and if so to develop mitigation measures to ensure sustainability of the subspecies, such as, in general, not removing dead and downed logs or other woody debris from rare communities.

As discussed under Factor A above, the MSARNG recently updated its INRMP for Camp Shelby, and outlined conservation measures to be implemented specifically for the black pinesnake on 5,735 ac (2,321 ha) of potential pinesnake habitat owned or managed by DoD. These measures will benefit black pinesnake populations, and include a monitoring protocol to help evaluate the population and appropriate guidelines for maintaining suitable habitat and microhabitats.

In summary, outside of the National Forest and the area covered by the INRMP, existing regulatory mechanisms provide little protection from the primary threat of habitat loss for the black pinesnake. Longleaf restoration activities on Forest Service lands in Mississippi conducted for other federally listed species do improve habitat for black pinesnake populations located in those areas, but could be improved by ensuring the protection of the belowground refugia critical to the snake. We will continue to work with the Forest Service to design and implement a more aggressive strategy for protecting and monitoring the black pinesnake.

Factor E: Other Natural or Manmade Factors Affecting Its Continued Existence

Fire is the preferred management technique to maintain the longleaf pine ecosystem, and fire suppression has been considered a primary reason for the degradation of the remaining longleaf pine forest. It is a contributing factor in reducing the quality and quantity of available habitat for the black pinesnake. According to Wear and Greis (2013, p. 509), southern forests are likely to see increasing challenges to prescribed burning in the future as land-use changes involving fuels management, increased urban interface, and revised safety and health regulations will continue to constrain prescribed fire efforts. Some of these constraints could be in the form of reduced fire intervals or reductions in average area burned per fire event (strategies often used in management of pine plantations), which may not provide adequate fire intensity or frequency to suppress the overgrown understory and mid-story conditions that black pinesnakes are known to avoid (Duran 1998b, p. 32). During a 2005 study using radio-telemetry to track black pinesnakes, a prescribed burn bisected the home range of one of the study animals. The snake spent significantly more time in the recently burned area than in the area that had not been burned in several years (Smith 2005, 5 pp.).

Roads surrounding and traversing the remaining black pinesnake habitat pose a direct threat to the subspecies. Dodd *et al.* (2004, p. 619) determined that roads fragment habitat for wildlife. Population viability analyses have shown that road mortality estimates in some snake species have greatly increased extinction probabilities (Row *et al.* 2007, p. 117). In an assessment of data from radio-tracked eastern indigo snakes, 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). 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 (Clark *et al.* 2010, p. 1059). 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 and that populations of large snakes may be depressed by 50 percent or more due to this mortality (Rudolph *et al.* 1999, p. 130).

Black pinesnakes frequent the sandy hilltops and ridges where roads are most frequently sited. Even on public lands, roads are a threat. During Duran's (1998b 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 represent about 13 percent of all the pinesnakes found on Camp Shelby during that 8-year span (Lyman *et al.* 2012, p. 42). The majority of road crossings occurred between the last 2 weeks of May and the first 2 weeks of June (Lyman *et al.* 2011, p. 48), a time period when black pinesnakes are known to breed (Lyman *et al.* 2012, p. 42). In the study conducted by Baxley (2007, p. 83) on De Soto NF, 2 of the 8 snakes monitored with radio-transmitters were found dead on paved roads. This is an especially important issue on these public lands because the best remaining black pinesnake populations are concentrated there. It suggests that population declines may be due in part to adult mortality in excess of annual recruitment (Baxley and Qualls 2009, p. 290). Additional support for the threat of fragmentation by roads is presented by Steen *et al.* (2012, p. 1092) who suggested that their modelling study of habitat loss and degradation in snakes provided evidence that fragmentation by roads may be an impediment to maintaining viable populations of pinesnakes.

Exotic plant species degrade habitat for wildlife. In the Southeast, longleaf pine forest associations are susceptible to invasion by the exotic cogongrass (*Imperata cylindrica*), which may rapidly encroach into areas undergoing habitat restoration, and is very difficult to eradicate once it has become established, requiring aggressive control with herbicides (Yager *et al.* 2010, pp. 229–230). Cogongrass displaces native grasses, greatly reducing foraging areas, and forms thick mats so dense that ground-dwelling wildlife has difficulty traversing them (DeBerry and Pashley 2008, p. 74).

In many parts of Louisiana, Mississippi, and Alabama, there is a lack of understanding of the importance of snakes to a healthy ecosystem. Snakes are often killed intentionally when they are observed, and dead pinesnakes have been found that were shot (Duran 1998b, p. 34). Lyman *et al.* (2008, p. 34) and Duran (1998b, p. 34) both documented finding dead black pinesnakes that were intentionally run over, as evidenced by vehicle tracks that went off the road in vicinity of dead snakes. In addition, in one of these instances (Lyman *et al.* 2008, p. 34), footprints were observed going from the vicinity of the truck to the snake's head, which had been intentionally crushed. As development pressures mount on remaining black pinesnake habitat, human-snake interactions are expected to increase, which in turn is expected to increase mortality, especially of adults.

Questionnaires have shown that snakes are more likely to be intentionally run over than any other animal (Langley *et al.* 1989, p. 43), and black pinesnakes represent a large target as they attempt to cross roads, which may increase the frequency of deliberate killing (Whitaker and Shine 2000, p. 121).

On many construction project sites, erosion control blankets are used to lessen impacts from weathering, secure newly modified surfaces, and maintain water quality and ecosystem health. However, this polypropylene mesh netting (also often utilized for bird exclusion) has 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). 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 no known instance of injury or death from this netting has been documented for black pinesnakes, it has been demonstrated to have negative impacts on other terrestrial snake species of all sizes and thus poses a potential threat to the black pinesnake when used in its habitat.

Duran (1998b, p. 36) suggested that reproductive rates of wild black pinesnakes may be low, based on failure to detect either nests or mating behaviors as observed during his studies. This observation has not been corroborated in the literature for other *Pituophis* species; however, if low reproductive rates were common, it would inhibit conservation and recovery.

Random environmental events may also play a part in the decline of the black pinesnake. Two black pinesnakes were found dead on the De Soto NF during drought conditions of mid-summer and may have succumbed due to drought-related stress (Baxley 2007, p.41).

In summary, a variety of natural or manmade factors currently threaten the black pinesnake. Fire suppression has been considered a primary reason for degradation of the longleaf pine ecosystem; however, invasive species such as cogongrass also greatly reduce the habitat quality for the black pinesnake. Isolation of populations beyond the dispersal range of the subspecies is a serious threat due to the fragmentation of available habitat. The high percentage of radio-tracked black pinesnakes killed while trying to cross roads supports our conclusion that this is a serious threat, while human attitudes towards snakes represent another source of mortality. Stochastic threats such as drought have the potential to threaten black pinesnake populations, especially considering the possibility of more drastic thermal extremes due to climate change, and the suspected low reproductive rate of the subspecies could exacerbate other threats and limit population viability. Overall, the threats under Factor E may act in combination with threats listed above under Factors A through D and increase their severity.

Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the black pinesnake. The black pinesnake is considered extirpated from Louisiana and three counties in Mississippi. Threats to the remaining black pinesnake populations exist primarily from two of the five threat factors (Factors A and E); however, predation by fire ants and urban predators (Factor C), and limitations of existing laws and regulations (Factor D) also pose lower-magnitude threats to the subspecies. Potential threats such as snake fungal disease (Factor C) and entanglement in erosion control blankets (Factor E) represent documented sources of mortality in other snake species, but there is no evidence yet that these have caused mortality in black pinesnakes.

Threats also occur in combination, resulting in synergistically greater effects. Threats of habitat loss and degradation (Factor A) represent primary threats to the black pinesnake. While habitat restoration efforts are beginning to reverse the decline of the longleaf pine forest in parts of the southeastern United States, most of the black pinesnake's original habitat has been either converted from forests to other uses or is highly fragmented. Today, the longleaf pine ecosystem occupies less than 4 percent of its historical range, and the black pinesnake has been tied directly to this ecosystem. Much of the habitat outside of the De Soto National Forest in Mississippi (the core of the range) has become highly fragmented, and populations on these lands appear to be small and isolated on islands of suitable longleaf pine habitat (Duran 1998a, p. 17; Barbour 2009, pp. 6–13).

A habitat suitability study of all historical sites for the black pinesnake estimated that this subspecies likely no longer occurs in an estimated 60 percent of historical population segments. It is estimated that only 11 populations of black pinesnakes are extant today, of which about a third are located on isolated patches of longleaf pine habitat that continue to be degraded due to fire suppression and fragmentation (Factor E), incompatible forestry practices, and urbanization.

Threats under Factor E include fire suppression; roads; invasive plant species, such as cogongrass; random environmental events, such as droughts; and intentional killing by humans. Fire suppression and invasive plants result in habitat degradation. Roads surround and traverse the upland ridges, which are primary habitat for the black pinesnake, and these roads cause further fragmentation of the remaining habitat. In addition, roads also increase the rate of human-snake interactions, which likely result in the death of individual snakes. Vehicles travelling these roads cause the deaths of a substantial number of snakes. These threats in combination lead to an increased chance of local extirpations by making populations more sensitive to genetic, demographic, and environmental variability. This is especially true of populations on the periphery of the range, where smaller populations are considerably more vulnerable to the documented contraction of the longleaf pine ecosystem, and where stochastic events are more likely to cause further restrictions of the range of the black pinesnake.

Habitat loss has been extensive throughout the black pinesnake's range, and the remaining habitat has been fragmented into primarily small patches with barriers to dispersal between them, creating reproductively isolated individuals or populations. The inadequacy of laws and regulations protecting against habitat loss contributes to increases in urbanization and further fragmentation. Urbanization results in an increased density of roads, intensifying the potential for direct mortality of adult snakes and reductions in population sizes. Reductions in habitat quality and quantity have synergistic effects that may eventually cause localized extirpations. Threats to the black pinesnake, working individually or in combination, are ongoing and significant and have resulted in curtailment of the range of the subspecies.

The Act defines an endangered species as any species that is ''in danger of extinction throughout all or a significant portion of its range'' and a threatened species as any species ''that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.'' We find that the black pinesnake meets the definition of a threatened species

based on the immediacy, severity, and scope of the threats described above.

We find that endangered status is not appropriate for the black pinesnake because, while we found the threats to the subspecies to be significant and rangewide, we believe it is unlikely that the threats will act on the subspecies in a way that place the subspecies in danger of extinction throughout all or a significant portion of its range. About half of the remaining black pinesnake populations occur primarily on public lands that are at least partially managed to protect remaining longleaf pine habitat. Management efforts on those lands specifically targeting listed longleaf pine specialists, such as the gopher tortoise and red-cockaded woodpecker, should benefit the black pinesnake as well, especially if measures are employed to protect belowground refugia. Additionally, the 5,735 ac (2,321 ha) of suitable pinesnake habitat covered by the Camp Shelby INRMP are under a conservation plan whose objectives include specifically protecting black pinesnake microhabitats and increasing awareness of the human impacts to rare wildlife. Thus, although there is a general decline in the overall range of the subspecies and its available habitat, range contraction is not severe enough to indicate imminent extinction because of these existing efforts on public land and other ongoing restoration activities. Therefore, on the basis of the best available scientific and commercial information, we are listing the black pinesnake as threatened in accordance with sections 3(20) and 4(a)(1) of the Act.

Significant Portion of the Range

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. Because we have determined that black pinesnake is threatened throughout all of its range, no portion of its range can be ''significant'' for purposes of the definitions of ''endangered species'' and ''threatened species.'' See the Final Policy on Interpretation of the Phrase ''Significant Portion of Its Range'' in the Endangered Species Act's Definitions of ''Endangered Species'' and ''Threatened Species'' (79 FR 37578; July 1, 2014).

Available Conservation Measures

Other conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan identifies site-specific management actions that set a trigger for review of the five factors that control whether a species remains endangered or may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our Web site (*http://www.fws.gov/endangered*), or from our Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (*e.g.,* restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

Following publication of this final listing rule, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the States of Alabama, Louisiana, and Mississippi would be eligible for Federal funds to implement management actions that promote the protection or recovery of the black pinesnake. Information on our grant programs that are available to aid species recovery can be found at *http://www.fws.gov/grants.*

Please let us know if you are interested in participating in recovery efforts for the black pinesnake. Additionally, we invite you to submit any new information on this subspecies whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the subspecies' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the Forest Service or on National Wildlife Refuges

managed by the Service; issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq.*) permits by the U.S. Army Corps of Engineers; construction and maintenance of gas pipeline and power line rights-of-way by the Federal Energy Regulatory Commission; construction and maintenance of roads or highways by the Federal Highway Administration; land management practices supported by programs administered by the U.S. Department of Agriculture; Environmental Protection Agency pesticide registration; and projects funded through Federal loan programs, which may include, but are not limited to, roads and bridges, utilities, recreation sites, and other forms of development.

4(d) Rule

Under section 4(d) of the Act, the Service has discretion to issue regulations that we find necessary and advisable to provide for the conservation of threatened wildlife. We may also prohibit by regulation with respect to threatened wildlife any act prohibited by section 9(a)(1) of the Act for endangered wildlife. For the black pinesnake, the Service has developed a 4(d) rule that is tailored to the specific threats and conservation needs of this subspecies. Exercising this discretion, the Service has developed a 4(d) rule containing all the general prohibitions and exceptions to those prohibitions; these are found at 50 CFR 17.31 and 50 CFR 17.32. However, as a means to promote conservation efforts on behalf of the black pinesnake, we are finalizing a 4(d) rule for this subspecies that modifies the standard protection for threatened wildlife found at 50 CFR 17.31. In the case of a 4(d) rule, the general regulations (50 CFR 17.31 and 17.71) applying most prohibitions under section 9 of the Act to threatened species do not apply to that species, and the 4(d) rule contains the prohibitions necessary and advisable to conserve that species.

As discussed in the Summary of Factors Affecting the Species section of this rule, the primary threat to this subspecies is the continuing loss and degradation of the open pine forests habitat (*e.g.,* the longleaf pine ecosystem), which requires active management to ensure appropriate habitat conditions are present. Therefore, for the black pinesnake, the Service has determined that exemptions authorized under section 4(d) of the Act are appropriate to promote conservation of this subspecies. Foremost in the degradation of this habitat is the decline or absence of prescribed fire, as fire is the primary source of historical disturbance and maintenance, reduces mid-story and understory hardwoods, and promotes abundant native herbaceous groundcover in the natural communities of the longleaf pine ecosystem where the black pinesnake normally occurs. We recognize that forest management activities such as thinning, reforestation and afforestation, mid-story and understory vegetation management, and final harvest (particularly in stands with undesirable conditions) are often needed to maintain and/or restore forests to the conditions that are preferable to black pinesnakes. The primary habitat features that require protection in this ecosystem are the burned-out or naturally decayed pine stump holes that are heavily utilized by black pinesnakes, in association with the development of the herbaceous plant community that provides habitat and forage for prey. Therefore, activities causing significant subsurface disturbance (like those listed below under 3(b)) will not be exempted as these actions are detrimental to maintenance and development of stump holes and root channels critical to this subspecies. Another factor affecting the integrity of this ecosystem is the infestation of invasive plants, particularly cogongrass. Activities such as prescribed burning and invasive weed control, as well as forest management activities associated with restoring and maintaining the natural habitat to meet the needs of the black pinesnake, positively affect pinesnake habitat and provide an overall conservation benefit to the subspecies.

Provisions of the 4(d) Rule

See Summary of Changes to the Proposed Rule, above, for changes to the 4(d) rule based on information we received during the public comment period.

This 4(d) rule exempts from the general prohibitions at 50 CFR 17.31 take incidental to the following activities when conducted within habitats currently or historically occupied by the black pinesnake:

(1) Prescribed burning, including all fire break establishment and maintenance actions, as well as actions taken to control wildfires.

(2) Herbicide application for invasive plant species control, site-preparation, and mid-story and understory woody vegetation control. All exempted herbicide applications must be conducted in a manner consistent with Federal law, including Environmental Protection Agency label restrictions; applicable State laws; and herbicide application guidelines as prescribed by herbicide manufacturers.

(3) All forest management activities that maintain lands in a forested condition, except for: (a) Conversion of longleaf-pine-dominated forests (>51 percent longleaf in the overstory) to other forest cover types or land uses; or (b) those activities causing significant subsurface disturbance, including, but not limited to, shearing, wind-rowing, stumping, disking (except during fire break creation or maintenance), root-raking, and bedding.

We believe these actions and activities, while they may have some minimal level of harm or temporary disturbance to the black pinesnake, are not expected to adversely affect the subspecies' conservation and recovery efforts. They will have a net beneficial effect on the subspecies. When practicable and to the extent possible, the Service encourages managers to conduct the activities listed above in a manner to: Maintain suitable black pinesnake habitat in large tracts; minimize ground and subsurface disturbance; promote a diverse, abundant native herbaceous groundcover; and allow for the natural decay or burning of pine stumps. It should be noted that harvest of longleaf pine (and other species) is included in the exemption, as long as the longleaf pine forests are not converted to other forest cover types. Should landowners undertake activities in these areas (*e.g.,* such as converting from longleaf to loblolly) that are not covered by the exemptions above and are likely to result in take (as described below), they would need to consult with the Service to find ways to minimize impacts to the subspecies before proceeding with the activity.

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.32. With regard to threatened wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the subspecies, for economic hardship, for zoological exhibition, for educational purposes, and for incidental take in connection with otherwise lawful activities. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of

the effect of a final listing on proposed and ongoing activities within the range of a listed species. Based on the best available information, the following activities may potentially result in a violation of section 9 the Act; this list is not comprehensive:

(1) Unauthorized collecting, handling, possessing, selling, delivering, carrying, or transporting of the black pinesnake, including import or export across State lines and international boundaries, except for properly documented antique specimens of these taxa at least 100 years old, as defined by section 10(h)(1) of the Act.

(2) Introduction of nonnative species that compete with or prey upon the black pinesnake.

(3) Unauthorized destruction or modification of occupied black pinesnake habitat (*e.g.,* stumping, root raking, bedding) that results in significant subsurface disturbance or the destruction of pine stump holes and their associated root systems used as refugia by the black pinesnake, or that impairs in other ways the subspecies' essential behaviors such as breeding, feeding, or sheltering; and conversion of occupied longleaf-pine-dominated forests (>51 percent of longleaf in the overstory) to other forest cover types or land uses.

(4) Unauthorized use of insecticides and rodenticides that could impact small mammal prey populations, through either unintended or direct impacts within habitat occupied by black pinesnakes.

(5) Actions, intentional or otherwise, that would result in the destruction of eggs or cause mortality or injury to hatchling, juvenile, or adult black pinesnakes.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**). We encourage any landowner who is concerned about potential take of the pinesnake on their property from an action that is not covered under the 4(d) rule to consult with the Service on conservation measures that would avoid take or the process for obtaining an incidental take permit under a safe harbor agreement or habitat conservation plan.

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act, need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes. There are no tribal lands located within the range of the subspecies.

References Cited

A complete list of references cited in this rulemaking is available on the Internet at *http://www.regulations.gov* and upon request from the Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are the staff members of the Mississippi Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as follows:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. Amend § 17.11(h) by adding an entry for ''Pinesnake, black'' in alphabetical order under REPTILES to the List of Endangered and Threatened Wildlife to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
REPTILES							
*	*	*	*	*	*		*
Pinesnake, black	*Pituophis melanoleucus lodingi.*	U.S.A. (AL, LA, MS).	Entire	T	861	NA	17.42(h)
*	*	*	*	*	*		*

■ 3. Amend § 17.42 by adding paragraph (h) to read as follows:

§ 17.42 Special rules—reptiles.

* * * * *

(h) Black pinesnake (*Pituophis melanoleucus lodingi*).

(1) *Prohibitions.* Except as noted in paragraph (h)(2) of this section, all prohibitions and provisions of §§ 17.31 and 17.32 apply to the black pinesnake.

(2) *Exemptions from prohibitions.* Incidental take of the black pinesnake will not be considered a violation of section 9 of the Act if the take results from:

(i) Prescribed burning, including all fire break establishment and maintenance actions, as well as actions taken to control wildfires.

(ii) Herbicide application for invasive plant species control, site-preparation, and mid-story and understory woody vegetation control. All exempted herbicide applications must be conducted in a manner consistent with Federal law, including Environmental Protection Agency label restrictions; applicable State laws; and herbicide application guidelines as prescribed by herbicide manufacturers.

(iii) All forest management activities that maintain lands in a forested condition, except for:

(A) Conversion of longleaf-pine-dominated forests (>51 percent longleaf in the overstory) to other forest cover types or land uses; and

(B) Those activities causing significant subsurface disturbance, including, but not limited to, shearing, wind-rowing, stumping, disking (except during fire break creation or maintenance), root-raking, and bedding.

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Dated: September 28, 2015.

Stephen Guertin,

Acting Director, U.S. Fish and Wildlife Service.

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