warbler provided these activities abide by the conservation measures set forth in this paragraph and are conducted in accordance with applicable State, Federal, and local laws and regulations:

(i) The conversion of sun-grown coffee to shade-grown coffee plantations by the restoration and maintenance (*i.e.,* removal of invasive, exotic, and feral species; shade and coffee tree seasonal pruning; shade and coffee tree planting and replacement; coffee bean harvest by hands-on methods; and the use of standard pest control methods and fertilizers within the plantations) of shade-grown coffee plantations and native forests associated with this type of crop. To minimize disturbance to elfin-woods warbler, shade and coffee tree seasonal pruning must be conducted outside the peak of the elfin-woods warbler's breeding season (*i.e.,* July through February). The Service considers the use of pest control methods (*e.g.,* pesticides, herbicides) and fertilizers ''standard'' when it is used only twice a year during the establishment period of shade and coffee trees (*i.e.,* the first 2 years). Once the shade-grown coffee system reaches its functionality and structure (*i.e.,* 3 to 4 years), little or no chemical fertilizers, herbicides, or pesticides may be used.

(ii) Riparian buffer establishment though the planting of native vegetation and selective removal of exotic species.

(iii) Reforestation and forested habitat enhancement projects within secondary forests (*i.e.,* young and mature) that promote the establishment or improvement of habitat conditions for the species by the planting of native trees, selective removal of native and exotic trees, seasonal pruning of native and exotic trees, or a combination of these.

* * * * *

Dated: September 17, 2015.

Stephen Guertin,

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

[FR Doc. 2015–24775 Filed 9–29–15; 8:45 am]

BILLING CODE 4310–55–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R3–ES–2015–0145;4500030113]

RIN 1018–BA98

Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Eastern Massasauga Rattlesnake

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the eastern massasauga rattlesnake (*Sistrurus catenatus*), a rattlesnake species found in 10 States and 1 Canadian Province, as a threatened species under the Endangered Species Act (Act). If we finalize this rule as proposed, it would extend the Act's protections to this species. We have also determined that the designation of critical habitat for the eastern massasauga rattlesnake is not prudent.

DATES: We will accept comments received or postmarked on or before November 30, 2015. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by November 16, 2015.

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Search box, enter FWS–R3–ES–2015–0145, which is the docket number for this rulemaking. Then click on the Search button. On the resulting page, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on ''Comment Now!''

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R3–ES–2015–0145, U.S. Fish and Wildlife Service, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

We request that you send comments only by the methods described above. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see *Public Comments,* below, for more information).

FOR FURTHER INFORMATION CONTACT: Louise Clemency, Field Supervisor, U.S. Fish and Wildlife Service, Chicago Ecological Services Field Office, 1250 S. Grove Ave., Suite 103, Barrington, IL 60010–5010; by telephone 847–381–2253. 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, if a species is determined to be an endangered or threatened species throughout all or a significant portion of its range, we are required to promptly publish a proposal in the **Federal Register** and make a determination on our proposal within 1 year. Critical habitat shall be designated, to the maximum extent prudent and determinable, for any species determined to be an endangered or threatened species under the Act. Listing a species as an endangered or threatened species and designations and revisions of critical habitat can only be completed by issuing a rule. We have determined that designating critical habitat is not prudent for the eastern massasauga rattlesnake.

This rule proposes the listing of the eastern massasauga rattlesnake as a threatened species. The eastern massasauga rattlesnake is a candidate species for which we have on file sufficient information on biological vulnerability and threats to support preparation of a listing proposal, but for which development of a listing rule has been precluded by other higher priority listing activities. This rule reassesses all available information regarding status of and threats to the eastern massasauga rattlesnake.

The basis for our action. Under the Act, we can 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. Although there are several factors that are affecting the species' status, the loss of habitat was historically, and continues to be, the primary threat, either through development or through

changes in habitat structure due to vegetative succession.

We will seek peer review. We will seek comments from independent specialists to ensure that our designation is based on scientifically sound data, assumptions, and analyses. We will invite these peer reviewers to comment on our listing proposal. Because we will consider all comments and information we receive during the comment period, our final determination may differ from this proposal.

A Species Status Assessment (SSA) team prepared an SSA report for the eastern massasauga rattlesnake. The SSA team was composed of U.S. Fish and Wildlife Service biologists, in consultation with other species experts. The SSA represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the eastern massasauga rattlesnake. The SSA underwent independent peer review by 21 scientists with expertise in eastern massasauga rattlesnake biology, habitat management, and stressors (factors negatively affecting the species) to the species. The SSA and other materials relating to this proposal can be found on the Midwest Region Web site at *http://www.fws.gov/midwest/Endangered/* and at *http://www.regulations.gov* under docket number FWS–R3–ES–2015–0145.

Information Requested

Public Comments

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other concerned governmental agencies, Native American tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) The eastern massasauga rattlesnake's biology, range, and population trends, including:

(a) Biological or ecological requirements of the species, including habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution patterns;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the species or its habitat.

(2) Factors that may affect the continued existence of the species, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors.

(3) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this species and existing regulations that may be addressing those threats.

(4) Whether designating critical habitat is prudent for this species and, if so, the reasons why any habitat should or should not be determined to be critical habitat for the eastern massasauga rattlesnake as provided by section 4 of the Act, including physical or biological features within areas occupied or specific areas outside of the geographic area occupied that are essential for the conservation of the species.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or threatened species must be made ''solely on the basis of the best scientific and commercial data available.''

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section. We request that you send comments only by the methods described in the **ADDRESSES** section.

If you submit information via *http://www.regulations.gov,* your entire submission—including any personal identifying information—will be posted on the Web site. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *http://www.regulations.gov.*

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov,* or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Chicago Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearing

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the **Federal Register** (see DATES, above). Such requests must be sent to the address shown in the **FOR FURTHER INFORMATION CONTACT** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our listing determination is based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in eastern massasauga rattlesnake biology, habitat management, climate change, and other stressors to the species. We previously conducted peer review on the SSA, which informs our determination as discussed below. We invite comment from the peer reviewers during this public comment period.

Previous Federal Actions

We identified the eastern massasauga rattlesnake as a Category 2 species in the December 30, 1982, Review of Vertebrate Wildlife for Listing as Endangered or Threatened Species (47 FR 58454). Category 2 candidates were defined as species for which we had information that proposed listing was possibly appropriate, but conclusive data on biological vulnerability and threats were not available to support a proposed rule at the time. The species remained so designated in subsequent candidate notices of review (CNORs) for animal species (50 FR 37958, September 18, 1985; 54 FR 554, January 6, 1989; 56 FR 58804, November 21, 1991; 59 FR 58982, November 15, 1994). In the February 28, 1996, CNOR (61 FR 7596), we discontinued the designation of Category 2 species as candidates; therefore, the eastern massasauga rattlesnake was no longer a candidate species.

Subsequently, in 1999, the eastern massasauga rattlesnake was added to the

candidate list (64 FR 57534; October 25, 1999) through the Service's internal candidate review process. Candidates are those fish, wildlife, and plants for which we have on file sufficient information on biological vulnerability and threats to support preparation of a listing proposal, but for which development of a listing regulation is precluded by other higher priority listing activities. The eastern massasauga rattlesnake was included in all of our subsequent CNORs (66 FR 54808, October 30, 2001; 67 FR 40657, June 13, 2002; 69 FR 24876, May 4, 2004; 70 FR 24870, May 11, 2005; 71 FR 53756, September 12, 2006; 72 FR 69034, December 6, 2007; 73 FR 75176, December 10, 2008; 74 FR 57804, November 9, 2009; 75 FR 69222, November 10, 2010; 76 FR 66370, October 26, 2011; 77 FR 69994, November 21, 2012; 78 FR 70104, November 22, 2013; 79 FR 72450, December 5, 2014). On May 11, 2004, we were petitioned to list the eastern massasauga rattlesnake, although no new information was provided in the petition. Because we had already found the species warranted listing through our internal candidate assessment process and it was already a candidate species, no further action was taken on the petition. The eastern massasauga rattlesnake has a listing priority number of 8, which reflects a species with threats that are imminent and of moderate to low magnitude.

Background

A thorough background and review of the ecology, life history, and taxonomy of the eastern massasauga rattlesnake can be found in the Species Status Assessment for the Eastern Massasauga Rattlesnake (Szymanski *et al.* 2015, entire) available at *http://www.fws.gov/midwest/Endangered/* and at *http://www.regulations.gov* under Docket No. FWS–R3–ES–2015–0145. The eastern massasauga rattlesnake is a pitviper with a small (0.6 to 1 meter (2 to 3 feet)) but heavy body, heart-shaped head, and vertical pupils. As a pitviper, eastern massasaugas have an extrasensory ''pit'' located on each side of the head between the eyes and the nares (nostrils). Adult eastern massasaugas have gray or light brown coloration with large brown to black blotches encircled in lighter edges (these blotches are smaller on their sides). Tipped by gray-yellow keratinized (containing the fibrous protein called keratin) rattles, eastern massasauga tails have several dark brown rings. Younger snakes are distinguished from adults only by paler versions of the same markings and bright yellow tails that grow darker with age. This species can be distinguished from the closely related western massasauga rattlesnake (*Sistrurus tergeminus*) by the number of ventral (belly) scales, the ventral coloration and pattern, the number of and shape of dorsal blotches, and markings and patterns on the nape of the neck and head (Gloyd 1940, pp. 36, 38–40, 42–44, 46–49, 52–55; Evans and Gloyd 1948, pp. 3–6).

First described by Rafinesque in 1818, the eastern massasauga rattlesnake is known by several locally used common names: Eastern massasauga rattlesnake, eastern massasauga prairie rattlesnake, spotted rattler, and swamp rattler (Glody 1940, p. 44; Minton 1972, p. 315). The eastern massasauga rattlesnake was previously recognized by the Service as a subspecies (*Sistrurus catenatus catenatus*) of a wider-ranging species (Conant and Collins 1998, pp. 231–232) (*Sistrurus catenatus*), but in 2011, was categorized as a distinct species based on published scientific information on the phylogenetic relationships of massasaugas (Kubatko *et al.* 2011, p. 13; Gibbs *et al.* 2011, pp. 433–439). The historical range documented for eastern massasauga rattlesnakes included western New York, western Pennsylvania, the lower peninsula and on Bois Blanc Island in Michigan, the northern two-thirds of Ohio and Indiana, the northern three-quarters of Illinois, the southern half of Wisconsin, extreme southeast Minnesota, east-central Missouri, the eastern third of Iowa, and far southwestern Ontario, Canada. Currently, the eastern massasauga rattlesnake's range still reflects this distribution, although the range is now more restricted than at the time the eastern massasauga rattlesnake was first identified as a candidate species in 1999, because populations in central and western Missouri have since been reclassified as western massasauga rattlesnakes (Kubatko *et al.* 2011, p. 404; Gibbs *et al.* 2011, pp. 433–439).

Eastern massasauga rattlesnakes hibernate in the winter and are active in spring, summer, and fall. The type of habitat used during the active season generally consists of higher, drier habitats, open canopy wetlands, and adjacent upland areas (Sage 2005, p. 32; Lipps 2008, p. 1). Active season habitat use varies regionally (Reinert and Kodrich 1982, p. 169; Johnson *et al* 2000, p. 3), and individual snakes can be found in a wide variety of habitats, including old fields (Reinert and Kodrich 1982, p. 163; Mauger and Wilson 1999, p. 111), bogs, fens (Kingsbury *et al* 2003, p. 2; Marshall *et al.* 2006, p. 142), shrub swamps, wet meadows, marshes (Wright 1941, p. 660; Sage 2005, p. 32), moist grasslands, wet prairies (Siegel 1986, p. 334), sedge meadows, peatlands (Johnson and Leopold 1998, p. 84), forest edge, scrub shrub forest (DeGregorio *et al.* 2011, p. 378), floodplain forests (Moore and Gillingham 2006, p. 745), and coniferous forests (Harvey and Weatherhead 2006, p. 207). During the active season, snakes thermoregulate (regulate body temperature) through basking in order to perform physiological functions like shedding, digestion, movement, and gestation (process of carrying young in the uterus). Basking sites are generally open, sunny areas in higher and drier habitats than those used for hibernation.

While there is regional variation, in general, after using higher, drier habitats during the active season, the eastern massasauga rattlesnake moves to lower, wet areas for overwintering or hibernation (Reinert and Kodrich 1982, pp. 164, 169; Johnson *et al.* 2000, p. 3; Harvey and Weatherhead 2006, p. 214; Mauger and Wilson 1999, p. 117). Hibernation sites provide insulated and moist subterranean spaces below the frost line where individuals can avoid freezing and dehydration (Sage 2005, p. 56). These hibernation sites can occur in wetland, wetland edges, wet prairie, closed canopy forests with mossy substrates (DeGregorio 2008, p. 20), wet grassland, and sedge meadow (Mauger and Wilson 1999, p. 116).

The availability of retreat sites is important to the snake at all times of the year. Retreat sites are generally used by the snake to hide from potential predators, but are also important to gain shelter from extreme temperatures, because these sites are more thermally stable than surface habitat (Shoemaker 2007, pp. 9–10). Retreat sites can be hibernacula, rock crevices, hummocks, live or dead tree root systems, mammal holes, crayfish burrows, shrubs, boards, burn piles before burning, or any structure that a snake can crawl into or under.

Adult eastern massasauga rattlesnakes forage by ambushing prey, which are primarily small mammals (voles (*Microtus* spp.), deer mice (*Peromyscus* spp.), and short-tailed shrew (*Blarina* spp.)), that vary according to whatever prey species is most readily available within the habitat. Juvenile eastern massasaugas also prey on small mammals, but feed occasionally on other species of snakes (*e.g.,* brown snakes, *Storeria dekayi*). Neonates, born near the end of summer with a short active season before hibernation, feed mainly on snakes, perhaps due to the size of their mouth openings

(VanDeWalle and VanDeWalle 2008, p. 358; Shepard *et al.* 2004, p. 365).

Eastern massasauga rattlesnakes (both males and females) reach sexual maturity at roughly 2 years of age and are ovoviviparous (the females give birth to broods of live young) ranging from 3 to 20 in number, with an average brood size of 9 but varying throughout the range (Anton 2000, p. 248; Bielma 1973, p. 46; Aldridge *et al.* 2008, p. 404; Jellen 2005, p. 47). Both annual and biennial reproductive cycles have been reported (Reinert 1981, pp. 383–384; Johnson 1995, p. 109). Those individuals that do reproduce annually most likely mate in the spring and bear young in the late summer or autumn. Conversely, biennially reproductive females probably mate in the autumn and either store sperm until the following spring (Johnson 1992, p. 52) or suspend embryo development over winter and bear young the next summer (Prior 1991). Mating is most prevalent in the summer or early autumn and occasionally in spring (Aldridge and Duvall 2002, p. 6; Aldridge *et al.* 2008, p. 405; Jellen 2005, p. 41; Johnson 1995, p. 109; Johnson 2000, p. 189; Reinert 1981, pp. 383–384; Swanson 1933, p. 37). Male eastern massasaugas tend to occur in higher ratios than receptive females, because the most common female condition (biennial reproduction) essentially results in two female reproductive populations, whereas males can breed every year. Because of the higher ratio of males, males intensely compete for mates and face prolonged periods of mate searching, longer daily movements, and defensive female polygyny (having multiple mates) during the mating season (Jellen 2005, p. 9; Johnson 2000, p. 189).

Summary of Biological Status and Threats

The Act directs us to determine whether any species is an endangered species or a threatened species because of any factors affecting its continued existence. We completed a comprehensive assessment of the biological status of the eastern massasauga rattlesnake, and prepared the SSA report, which provides a thorough description of the species' overall viability. We define viability as the ability of the species to maintain multiple, self-sustaining populations across the full gradient of genetic and ecological diversity of the species. We used the conservation biology principles of resiliency, representation, and redundancy in our analysis. Briefly, resiliency is the ability of the species to withstand stochasticity; redundancy is the ability of the species to withstand catastrophic events; and representation is the ability of the species to adapt over time to long-term changes in the environment. In general, the more redundant, representative, and resilient a species is, the more likely it is to sustain populations over time, even under changing environmental conditions. Using these principles, we considered the eastern massasauga rattlesnake's needs at the individual, population, and species scales. We also identified the beneficial and risk factors influencing the species' viability. We considered the degree to which the species' ecological needs are met both currently and as can be reliably forecasted into the future, and assessed the consequences of any unmet needs as they relate to species viability. In this section, we summarize the conclusions of the SSA, which can be accessed at *http://www.fws.gov/midwest/Endangered/* and at *http://www.regulations.gov* under Docket No. FWS–R3–ES–2015–0145.

For survival and reproduction at the individual level, the eastern massasauga rattlesnake requires appropriate habitat, which varies depending on the season and its life stage (see Background section, above). During the winter (generally October through March), they occupy hibernacula, such as crayfish burrows. Intact hydrology at eastern massasauga rattlesnake sites is important in maintaining conditions, such as crayfish burrows with high enough water levels to support the survival of hibernating eastern massasauga rattlesnakes. During their active season (after they emerge from hibernacula), they require low canopy cover and sunny areas (intermixed with shaded areas) for thermoregulation (basking and retreat sites), abundant prey (foraging sites), and the ability to escape predators (retreat sites). Habitat structure, including early successional stage and low canopy cover, appears to be more important for eastern massasauga rattlesnake habitat than plant community composition or soil type. Maintaining such habitat structure may require periodic management of most habitat types occupied by the eastern massasauga rattlesnake.

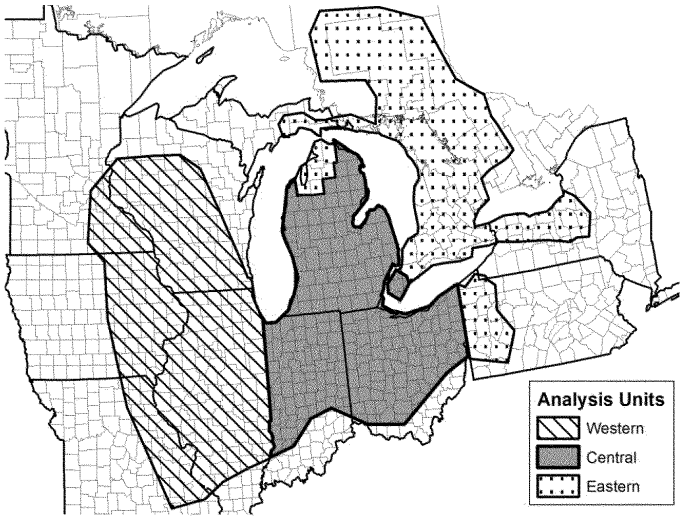
At the population level, the eastern massasauga rattlesnake requires sufficient population size, population growth, survivorship (the number of individuals that survive over time), recruitment (adding individuals to the population through birth or immigration), population structure (the number and age classes of both sexes), and size. Populations also require a sufficient quantity of high-quality microhabitats with intact hydrology and ecological processes that maintain suitable habitat, and connectivity among these microhabitats. In the SSA, a self-sustaining population of eastern massasauga rattlesnakes is defined as one that is demographically, genetically, and physiologically robust (a population with 50 or more adult females and a stable or increasing growth rate), with a high level of persistence (a probability of persistence greater than 0.9) given its habitat conditions and the risk or beneficial factors operating on it.

We relied on a population-specific model developed by Faust *et al.* (2011, entire) (hereafter referred to as the Faust model) to assess the health of populations across the eastern massasauga rattlesnake's range. Faust and colleagues developed a generic, baseline model for a hypothetical, healthy (growing) eastern massasauga rattlesnake population. Using this baseline model and site-specific information, including population size estimate, risk factors operating at the site, and potential future management changes that might address those factors, the Faust model forecasted the future condition of 57 eastern massasauga rattlesnake populations over three different time spans (10, 25, and 50 years) (for more details on the Faust model, see pp. 4–6 in the SSA report). We extrapolated the Faust model results and supplemental information gathered since 2011 to forecast the future conditions of the other (non-modeled; n=331) eastern massasauga rattlesnake populations.

At the species level, the eastern massasauga rattlesnake requires multiple (redundant), self-sustaining (resilient) populations distributed across areas of genetic and ecological diversity (representative). Using the literature on distribution of genetic diversity across the range of this species, we identified three geographic ''analysis units'' corresponding to ''clumped'' genetic variation patterns across the eastern massasauga rattlesnake populations (Figure 1). A reasonable conclusion from the composite of genetic studies that exist (Gibbs *et al.* 1997, entire; Andre 2003, entire; Chiucchi and Gibbs 2010, entire; Ray *et al.* 2013, entire) is that there are broad-scaled genetic differences across the range of the eastern massasauga rattlesnake, and within these broad units, there is genetic diversity among populations comprising the broad units. Thus, we assume these genetic variation patterns represent areas of unique adaptive diversity. We subsequently use these analysis units (eastern, central, and

western) to structure our analysis of viability.

Figure 1: The three genetically distinct "analysis units" (western, central, and eastern) adapted from Ray *et al.* 2013.



Species' Current Condition

As a result of the risk factors acting on eastern massasauga rattlesnake populations, the resiliency of the eastern massasauga rattlesnake across its range and within each of the three analysis units has declined from its historically known condition. Rangewide, there are 581 known historical eastern massasauga rattlesnake populations, of which 267 are known to still be extant, 163 are likely extirpated or known extirpated, and 121 are of unknown status. For the purposes of our assessment, we considered all populations with extant or unknown status as currently extant (referred to as presumed extant, n=388). Of those 388 populations presumed extant, 40 percent are likely quasi-extirpated (*i.e.,* have 25 or fewer adult females).

The number of presumed extant populations has declined from the number that was known historically rangewide by 33 percent (and 31 percent of the presumed extant populations have unknown status). Of those populations presumed extant, 156 (40 percent) are presumed to be quasi-extirpated while 99 (26 percent) are presumed to be demographically, genetically, and physiologically robust (Table 1). Of these presumed demographically, genetically, and physiologically robust populations, 29 (7 percent) are presumed to have conditions suitable for maintaining populations over time (risk factors affecting the species at those populations are nonexistent or of low impact) and, thus, are self-sustaining. The greatest declines in resiliency occurred in the western analysis unit, where only 21 populations are presumed extant, and of these, only 1 is presumed to be self-sustaining. Although to a lesser degree, loss of resiliency has occurred in the central and eastern analysis units, where 22 and 6 populations, respectively, are presumed to be self-sustaining.

TABLE 1—THE NUMBER OF POPULATIONS BY STATUS RANGEWIDE

[DGP = demographically, genetically, and physiologically]

Status	Number of populations rangewide	Percentage of presumed extant populations
Presumed Extant	388	.....
Quasi-extirpated ..	156	40
DGP robust (self-sustaining)	99 (29)	26 (7)

The degree of representation, as measured by spatial extent of occurrence, across the range of the eastern massasauga rattlesnake, has declined as noted by the northeasterly contraction in the range and by the loss of area occupied within the analysis units (see pp. 52–55 in the SSA report). Overall, there has been more than a 46 percent reduction of extent of occurrence rangewide (Table 2). This loss has not been uniform, with the western analysis unit encompassing most of this decline (69 percent reduction in extent of occurrence in the western analysis unit). However, losses of 43 percent and 32 percent of the extent of occurrence in the central analysis unit and eastern analysis unit, respectively, are notable as well. The results are not a true measure of area occupied by the species, but rather a coarse evaluation to make relative comparison among years. The reasons for this are twofold: (1) The calculations are done at the county, rather than the population, level; and (2) if at least one population was projected to be extant, the entire county was included in the analysis, even if other populations in the county were projected to be extirpated. Assuming that loss of range equates to loss of adaptive diversity, the degree of representation of the eastern massasauga rattlesnake has declined since historical conditions.

TABLE 2—THE PERCENT REDUCTION IN EXTENT OF OCCURRENCE FROM HISTORICAL TO PRESENT DAY

[WAU = western analysis unit, CAU = central analysis unit, EAU = eastern analysis unit]

Analysis unit	Percent reduction
WAU	69
CAU	43
EAU	32
Rangewide	46

The redundancy of the eastern massasauga rattlesnake has also declined since historical conditions. Potential catastrophic events relevant to eastern massasauga rattlesnake populations include disease, flooding, and drought. We were unable to find sufficient information on the likelihood of disease outbreaks, the factors that affect disease spread, and the magnitude of impact on eastern massasauga rattlesnake populations to assess the risk from a catastrophic disease outbreak. Similarly, we were unable to assess flooding as a catastrophic risk, but we did consider the impacts of flooding and disease as general factors affecting the species in our assessment. We assess the vulnerability of unit-wide extirpation due to varying drought intensities below. Extreme fluctuations in the water table may negatively affect body condition for the following active season, cause early emergence, or cause direct mortality (Harvey and Weatherhead 2006, p. 71; Smith 2009, pp. vii, 33, 38–39). Changes in water levels under certain circumstances can cause mortality to individuals, particularly during hibernation (Johnson *et al.* 2000, p. 26; Kingsbury 2002, p. 38) when the snakes are underwater. The water in the hibernacula protects the eastern massasauga rattlesnake from dehydration and freezing, and, therefore, dropping the levels in the winter leaves the snakes vulnerable to both (Kingsbury 2002, p. 38; Moore and Gillingham 2006, p. 750; Smith 2009, p. 5). Because individual eastern massasauga rattlesnakes often return to the same hibernacula year after year, dropping water levels in hibernacula could potentially decimate an entire population if the majority of individuals in that population hibernate in the same area.

The Drought Monitor (a weekly map of drought conditions that is produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln) classifies general drought areas by intensity, with D1 being the least intense drought and D4 being the most intense drought. For the eastern massasauga rattlesnake, the risk of unit-wide extirpation due to a catastrophic drought varies by analysis unit and by the level of drought considered. Experts believe drought intensities of magnitude D2 or higher are likely to make the species more vulnerable to overwinter mortality and cause catastrophic impacts to eastern massasauga rattlesnake populations. In the central and eastern analysis units, the annual frequency rate for a D3 or D4 drought is zero, so there is little to no risk of unit-wide extirpation regardless of how broadly dispersed the species is within the unit. In the eastern analysis unit, the annual frequency rate for a D2 drought is also zero. Portions of the central analysis unit are at risk of a D2-level catastrophic drought; populations in the southern portion of the central analysis unit and scattered portions in the north are at risk from such a drought. In the western analysis unit, the risk of unit-wide extirpation based on the frequency of a D3 drought is low, but the risk of losing clusters of populations within the western analysis unit is notable; 5 of the 8 population clusters are vulnerable to a catastrophic drought. The probability of unit-wide extirpation in the western analysis unit is notably higher with D2 frequency rates; 7 of the 8 clusters of populations are at risk of D2-level catastrophic drought. Thus, the probability of losing most populations within the western analysis unit due to a catastrophic drought is high.

Assessment of Threats and Conservation Measures

The most prominent risk factors affecting the eastern massasauga rattlesnake include habitat loss and fragmentation, especially through development and vegetative succession, road mortality, hydrologic alternation resulting in drought or flooding, persecution, collection, and mortality of individuals as a result of post-emergent (after hibernation) prescribed fire and mowing. Habitat loss includes direct habitat destruction of native land types (*e.g.,* grassland, swamp, fen, bog, wet prairie, sedge meadow, marshland, peatland, floodplain forest, coniferous forest) due to conversion to agricultural land, development, and infrastructure associated with development (roads, bridges). Because eastern massasauga rattlesnake habitat varies seasonally and also varies over its range, the destruction of even a portion of a population's habitat (*e.g.,* hibernacula or gestational sites) causes a negative effect to individual snakes, thus reducing the numbers of individuals in a population and, in turn, reducing the viability of that population. Habitat is also lost due to fragmentation, succession, exotic species invasion, dam construction, fire suppression, water level manipulation, and other incompatible habitat modifications (Jellen 2005, p. 33). These non-development-related habitat losses continue even in publicly held areas protected from development.

Vegetative succession is a major contributor to habitat loss (Johnson and Breisch 1993, pp. 50–53; Reinert and Buskar 1992, pp. 56–58). The open vegetative structure, typical of eastern massasauga rattlesnake habitat, provides the desirable thermoregulatory areas, increases prey densities by enhancing the growth of sedges and grasses, and provides retreat sites. Degradation of eastern massasauga rattlesnake habitat typically happens through woody vegetation encroachment or the introduction of nonnative plant species. These events alter the structure of the habitat and make it unsuitable for the eastern massasauga rattlesnake by reducing and eventually eliminating thermoregulatory and retreat areas. Fire suppression has led to the widespread loss of open canopy habitats through succession (Kingsbury 2002, p. 37). Alteration in habitat structure and quality can also affect eastern massasauga rattlesnakes by reducing the forage for the species' prey base (Kingsbury 2002, p. 37).

An effective tool for controlling vegetative succession is the use of prescribed fire, which kills or temporarily sets back the growth of woody vegetation, retards the growth of undesirable species, and stimulates the response of prairie species (Johnson *et al.* 2000, p. 25). Mowing and herbicide application are two additional strategies, often used in conjunction with prescribed burning, to control woody vegetation and invasive species encroachment. However, direct mortality of snakes can result from exposure to fire or mowers, if these activities occur when the snakes are out of their hibernacula (post-emergent fire) (Cross 2009, pp. 18, 19, 24; Cross *et al.* 2015, p. 355; Dreslik 2005, p. 180; Dreslik *et al.* 2011, p. 22; Durbian 2006, p. 333).

Roads, bridges, and other structures constructed in eastern massasauga rattlesnake habitat fragment the snakes' habitat and impact the species both through direct mortality as snakes are killed trying to cross these structures (Shepard *et al.* 2008b, p. 6), as well as indirectly through the loss of access to habitat components necessary for the survival of the snakes.

Because of the fear and negative perception of snakes, many people have a low interest in snakes or their conservation and consequently large numbers of snakes are deliberately killed (Whitaker and Shine 2000, p. 121; Alves *et al.* 2014, p. 2). Human-snake encounters frequently result in the death of the snake (Whitaker and Shine 2000, pp. 125–126). Given the species' site fidelity and ease of capture once located, the eastern massasauga rattlesnake is particularly susceptible to

collection. Poaching and unauthorized collection of the eastern massasauga rattlesnake for the pet trade is a factor contributing to declines that has significant impact on this species (*e.g.,* Jellen 2005, p. 11; Baily *et al.* 2011, p. 171).

Assessing the occurrence of the above-mentioned risk factors, we found that 97 percent of the presumed extant eastern massasauga rattlesnake populations have at least one risk factor (with some degree of impact on the species) currently affecting the site. Unmanaged vegetative succession is the most commonly occurring risk factor, with 75 percent of sites being impacted by succession. Vegetative succession makes eastern massasauga rattlesnake habitat unsuitable by reducing or eliminating thermoregulatory and retreat areas. Post-emergent fire is the second most common risk factor (69 percent of sites), and fragmentation is the third most common factor (67 percent of sites). Some form of habitat loss or modification is occurring at 52 percent of the sites; 17 percent of these sites are at risk of total habitat loss (all habitat at the site being destroyed or becoming unusable by the species). Among the other risk factors considered, water fluctuation, collection or persecution, and road mortality occur at 38 percent, 35 percent, and 15 percent of the sites, respectively.

We also considered the magnitude of impact of the various risk factors. The Faust model indicates that the risk factors most likely to push a population to quasi-extirpation within 25 years (high magnitude risk factors) are late-stage vegetative succession, high habitat fragmentation, moderate habitat fragmentation, total habitat loss, and moderate habitat loss or modification. Our analysis shows that 84 percent of eastern massasauga rattlesnake populations are impacted by at least one high magnitude risk factor, and 63 percent are affected by multiple high magnitude risk factors. These risk factors are chronic and are expected to continue with a similar magnitude of impact into the future, unless ameliorated by increased implementation of conservation actions. Furthermore, these multiple factors are not acting independently, but are acting together, which can result in cumulative effects that lower the overall viability of the species.

In addition to the above risk factors, other factors may be affecting individuals. Disease (whether new or currently existing at low levels but increasing in prevalence) is another emerging and potentially catastrophic stressor to eastern massasauga rattlesnake populations. For example, snake fungal disease (SFD) is an emerging disease found in populations of wild snakes in the eastern and midwestern United States, and the eastern massasauga rattlesnake is one of the species that has recently been diagnosed with SFD (Sleeman 2013, p. 1; Allender *et al.* 2011, p. 2383). However, we do not have sufficient information on the emergence and future spread of SFD or other diseases to reliably model this stressor for forecasting future conditions for the rattlesnake. Our quantitative modeling analysis also does not consider two other prominent risk factors, road mortality and persecution, due to a lack of specific information on the magnitude of impacts from these factors. Additionally, this species is vulnerable to the effects of climate change through increasing intensity of winter droughts and increasing risk of summer floods, particularly in the southwest part of its range (Pomara *et al.,* undated; Pomara *et al.* 2014, pp. 95–97). Thus, while we acknowledge and considered that disease, road mortality, persecution/collection, and climate changes are factors that affect the species, and which may increase or exacerbate existing threats in the future, our viability assessment does not include a quantitative analysis of these stressors.

Of the 267 sites with extant eastern massasauga populations, 64 percent (171) occur on land (public and private) that is considered protected from development; development may result in loss or fragmentation of habitat. Signed candidate conservation agreements with assurances (CCAAs) with the Service exist for two of these populations. These CCAAs include actions to mediate the stressors acting upon the populations and provide management prescriptions to perpetuate eastern massasauga rattlesnakes on these sites. For example, at an additional 22 sites, habitat restoration or management, or both, is occurring. Information is not available for these sites to know if habitat management has mediated the current risk factors acting upon the populations; the Faust model, however, included these activities in the projections of trends, and, thus, our future condition analyses considered these activities and assumed that ongoing restoration would continue into the future. Lastly, another 18 populations have conservation plans in place. Although these plans are intended to manage for the eastern massasauga rattlesnake, sufficient site-specific information is not available to assess whether these restoration or management activities are currently ameliorating the stressors acting upon the population. Thus, we were unable to include the potential beneficial impacts into our quantitative analyses.

Species' Projected Future Condition

To assess the future resiliency, representation, and redundancy of the eastern massasauga rattlesnake, we used the Faust model results to predict the number of self-sustaining populations likely to persist over the next 10, 25, and 50 years, and extrapolated those proportions to the remaining presumed extant populations to forecast the number of self-sustaining populations likely to persist at the future time scales. We then predicted the change in representation and redundancy.

The projected future resiliency (the number of self-sustaining populations) varies across the eastern massasauga rattlesnake's range. In the western analysis unit, 83 percent of the modeled populations are projected to have a declining trajectory and 94 percent of the populations a low probability of persistence (*i.e.,* the probability of remaining above the quasi-extirpated threshold of 25 adult females; $p(P)<0.90$) by year 25, and, thus, the number of forecasted populations likely to be extant declines over time. By year 50, 17 of the 21 presumed extant populations are projected to be extirpated (*i.e.,* no individuals remain; n=15) or quasi-extirpated (n=2), with only 1 population projected to be self-sustaining. The resiliency of the western analysis unit is forecasted to decline over time. The situation is similar in the central and eastern analysis units, but to a lesser degree. In the central analysis unit, 70 percent of the modeled populations are projected to have a declining trajectory and 78 percent a low probability of persistence, and thus, by year 50, 196 of the 294 presumed extant populations are projected to be extirpated (n=174) or quasi-extirpated (n=22), and 54 populations to be self-sustaining. In the eastern analysis unit, 83 percent of the modeled populations are projected to have a declining trajectory and 92 percent of the populations are projected to have a low probability of persistence, and, thus, by year 50, 61 of the 73 presumed extant populations are projected to be extirpated (n=55) or quasi-extirpated (n=6), and 6 to be self-sustaining. Rangewide, 61 (16 percent) of the 388 populations that are currently presumed to be extant will be self-sustaining by year 50.

We calculated the future extent of occurrence (representation) for the 57 modeled populations (Faust model) and

for the populations forecasted to persist at years 10, 25, and 50 by using the counties occupied by populations to evaluate the proportions of the range falling within each analysis unit and the change in spatial distribution within each analysis unit. Our results indicate that eastern massasauga rattlesnake populations are likely to persist in all three analysis units; however, the distribution of the range is predicted to contract northeasterly, and the geographic area occupied will decline within each analysis unit over time. The results project a 65 percent reduction of the area occupied by the eastern massasauga rattlesnake rangewide by year 50, with the western analysis unit comprising most of the decline (83 percent reduction within the unit). These projected declines in extent of occurrence across the species' range and within the analysis units suggest that loss of adaptive diversity is likely to occur.

We assessed the ability of eastern massasauga rattlesnake populations to withstand catastrophic events (redundancy) by predicting the number of self-sustaining populations in each analysis unit and the spatial dispersion of those populations relative to future drought risk.

The future redundancy (the number and spatial dispersion of self-sustaining populations) across the eastern massasauga rattlesnake's range varies. In the western analysis unit, the risk of analysis-unit-wide extirpations from either a D2 or D3 catastrophic drought is high, given the low number of populations forecasted to be extant. Coupling this with a likely concurrent decline in population clusters (reduced spatial dispersion), the risk of analysis-unit-wide extirpation is likely even higher. Thus, the level of redundancy in the western analysis unit is projected to decline into the future.

Conversely, in the eastern analysis unit, there is little to no risk of a D2- or D3-level drought, and consequently the probability of unit-wide extirpation due to a catastrophic drought is very low. Thus, redundancy, from a catastrophic drought perspective, is not expected to decline over time in the eastern analysis unit.

Similarly, in the central analysis unit, there is little to no risk of a D3 catastrophic drought. The southern and northern portions of the central analysis unit, however, are at risk of a D2-level catastrophic drought. Losses of populations in these areas may lead to portions of the central analysis unit being extirpated and will also increase the probability of analysis-unit-wide extirpation. However, the risk of analysis-unit-wide extirpation will likely remain low given the presumed persistence of multiple populations scattered throughout low drought risk areas. Thus, from a drought perspective, the level of redundancy is not likely to be noticeably reduced in the central analysis unit (see Figure 4.3 (p. 60) in the SSA report for a detailed map). A caveat to this conclusion, however, is that the forecasted decline in extent of occurrence suggests our data are too coarse to tease out whether the forecasted decline in populations will lead to substantial losses in spatial distribution, and, thus, the risk of analysis-unit-wide extirpation might be higher than predicted. Therefore, the future trend in the level of redundancy in the central analysis unit is less clear than for either the western analysis unit or the eastern analysis unit.

Given the loss of populations to date, portions of the eastern massasauga rattlesnake's range are in imminent risk of extirpation in the near term. Specifically, our analysis suggests there is a high risk of extirpation of the western analysis unit and southern portions of the central and eastern analysis units within 10 to 25 years. Although self-sustaining populations are expected to persist, loss of populations within the central and eastern analysis units are expected to continue as well, and, thus, those populations are at risk of extirpation in the future. These losses have led to reductions in resiliency and redundancy across the range and may lead to irreplaceable loss of adaptive diversity across the range of the eastern massasauga rattlesnake, thereby leaving the eastern massasauga rattlesnake less able to adapt to a changing environment into the future. Thus, the viability of the eastern massasauga rattlesnake has and is projected to continue to decline over the next 50 years.

The reader is directed to the SSA for a more detailed discussion of our evaluation of the biological status of the eastern massasauga rattlesnake and the influences that may affect its continued existence. Our conclusions are based upon the best available scientific and commercial data.

Determination

Standard for Review

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.

Until recently, the Service has presented its evaluation of information under the five listing factors in an outline format, discussing all of the information relevant to any given factor and providing a factor-specific conclusion before moving to the next factor. However, the Act does not require findings under each of the factors, only an overall determination as to status (*e.g.,* threatened, endangered, not warranted). Ongoing efforts to improve the efficiency and efficacy of the Service's implementation of the Act have led us to present this information in a different format that we believe leads to greater clarity in our understanding of the science, its uncertainties, and the application of our statutory framework to that science. Therefore, while the presentation of information in this rule differs from past practice, it differs in format only. We have evaluated the same body of information that we would have evaluated under the five listing factors outline format, we are applying the same information standard, and we are applying the same statutory framework in reaching our conclusions.

Determination

We have carefully assessed the best scientific and commercial data available regarding the past, present, and future threats to the eastern massasauga rattlesnake and how those threats are affecting the species now and into the future. The species faces an array of threats that have and will likely continue (often increasingly) to contribute to declines at all levels (individual, population, and species). The loss of habitat was historically, and continues to be, the threat with greatest impact to the species (Factor A), either through development or through changes in habitat structure due to vegetative succession. Disease, new or increasingly prevalent, is another emerging and potentially catastrophic threat to eastern massasauga rattlesnake populations (Factor C). As population sizes decrease, localized impacts, such as collection and persecution of individuals, also increases the risk of extinction (Factor B). These risk factors are chronic and are expected to

continue with a similar magnitude of impact into the future. Additionally, this species is vulnerable to the effects of climate change through increasing intensity of winter droughts and increasing risk of summer floods (Factor E), particularly in the southwest part of its range (Pomera *et al.,* undated; Pomera *et al.* 2014, pp. 95–97). Some conservation actions (*e.g.,* management of invasive species and woody plant encroachment, timing prescribed fires to avoid the active season) are currently in place, which provide protection and enhancement to some eastern massasauga rattlesnake populations. However, our analysis projects that eastern massasauga rattlesnake populations will continue to decline even if current conservation measures are continued into the future. As a result of these factors, the numbers and health of eastern massasauga rattlesnake populations are anticipated to decline across the species' range, and particularly in the southwestern portions of the range, which have already experienced large losses relative to historical conditions. Further, the reductions in eastern massasauga rattlesnake population numbers, distribution, and health forecast in the SSA report represent the best case scenario for the species, and future outcomes may be worse than predicted. Because of the type of information available to us, the analysis assumes that threat magnitude and pervasiveness remains constant into the future, while it is more likely that the magnitude of threats will increase into the future throughout the range of the species, or that novel threats may arise. In addition, some currently identified threats are not included in the quantitative analysis (*e.g.,* disease, road mortality, persecution/collection, and climate changes), because we lack specific, quantitative information on how these factors may affect the species in the future. These factors and their potential effects on the eastern massasauga rattlesnake were discussed and considered as part of the determination.

The species' viability is also affected by losses of populations from historical portions of its range, which may have represented unique genetic and ecological diversity. The species is extirpated from Minnesota and Missouri, and many populations have been lost in the western part of the species' range. Rangewide, the extent of occurrence is predicted to decline by 65 percent by year 50. Actual losses in extent of occurrence will likely be greater than estimated because of the methodology used in our analysis, as discussed above.

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 an endangered species within the foreseeable future throughout all or a significant portion of its range.'' A key statutory difference between an endangered species and a threatened species is the timing of when a species may be in danger of extinction, either now (endangered species) or in the foreseeable future (threatened species). Based on the biology of the eastern massasauga rattlesnake and the degree of uncertainty of future predictions, we find that the ''foreseeable future'' for the species is best defined as 50 years. Forecasting to 50 years, the current threats are still reliably foreseeable at the end of that time span based on models, available information on threats impacting the species, and other analyses; however, we cannot reasonably predict future conditions for the species beyond 50 years. Our uncertainty in forecasting the status of the species beyond 50 years is also increased by our methodology of extrapolating from a subset of modeled populations to all extant or potentially extant populations.

We find that the eastern massasauga rattlesnake is likely to become endangered throughout its entire range within the foreseeable future based on the severity and pervasiveness of threats currently impacting the species. We find that the eastern massasauga rattlesnake is likely to be on the brink of extinction within the foreseeable future due to the projected loss of populations rangewide (loss of resiliency and redundancy) and the projected loss of its distribution within large portions of its range. This loss in distribution could represent a loss of genetic and ecological adaptive diversity, as well as a loss of populations from parts of the range that may provide future refugia in a changing climate. Furthermore, many remaining populations are currently experiencing high magnitude threats. Although these high magnitude threats are not currently pervasive rangewide, they are likely to become pervasive in the foreseeable future as they expand and impact additional populations throughout the species' range. Therefore, on the basis of the best available scientific and commercial data, we propose listing the eastern massasauga rattlesnake as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

We find that an endangered species status is not appropriate for the eastern massasauga rattlesnake. In assessing whether the species is in danger of extinction, we used the plain language understanding of this phrase as meaning ''presently in danger of extinction.'' We considered whether extinction is a plausible condition as the result of the established, present condition of the eastern massasauga rattlesnake. Based on the species' present condition, we find that the species is not currently on the brink of extinction. The timeframe for conditions that render the species on the brink of extinction is beyond the present. While the magnitude of threats affecting populations is high, threats are not acting at all sites at a sufficient magnitude to result in the species presently being on the brink of extinction. Additionally, some robust populations still exist, and we anticipate they will remain self-sustaining.

The SSA results represent the best-case scenario for this species. For example, the analysis treated populations of unknown status as if they were all extant, likely resulting in an overestimate of species' viability. Thus, we considered whether treating the populations with an ''unknown'' status as currently extant in the analysis had an effect on the status determination. We examined whether the number of self-sustaining populations would change significantly over time if we instead assumed that all populations with an ''unknown'' status were extirpated. The results are a more severe projected decline in eastern massasauga rattlesnake's status than our analysis projects when we assign the unknown status populations to the ''extant'' category, but not to the extent that we would determine the species to be currently in danger of extinction.

Under the Act and our implementing regulations, a species may warrant listing if it is an endangered or threatened species throughout all or a significant portion of its range. Because we have determined that eastern massasauga rattlesnake 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).

Critical Habitat

Prudency Determination

Background

Critical habitat is defined in section 3(5)(A) of the Act as: (i) The specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) Essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation is defined in section 3(3) of the Act as the use of all methods and procedures that are necessary to bring any endangered or threatened species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12), require that, to the maximum extent prudent and determinable, we designate critical habitat at the time the species is determined to be an endangered or threatened species. Our regulations (50 CFR 424.12(a)(1)) state that the designation of critical habitat is not prudent when one or both of the following circumstances exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species. We have determined that both circumstances apply to the eastern massasauga rattlesnake. This determination involves a weighing of the expected increase in threats associated with a critical habitat designation against the benefits gained by a critical habitat designation. An explanation of this ''balancing'' evaluation follows.

Increased Threat to the Taxon by Designating Critical Habitat

Poaching and unauthorized collection (Factor B) of the eastern massasauga rattlesnake for the pet trade is a factor contributing to declines, and remains a threat with significant impact to this species, commanding high black market value. For example, an investigation into reptile trafficking reports documented 35 eastern massasauga rattlesnakes (representing nearly one entire wild source population) collected in Canada and smuggled into the United States, most destined for the pet trade (Thomas 2010, unpaginated). Snakes in general are known to be feared and persecuted by people, and venomous species even more so (Ohman and Mineka 2003, p. 7; Whitaker and Shine 2000, p. 121). As a venomous snake, the eastern massasauga rattlesnake is no exception, with examples of roundups or bounties for them persisting through the mid-1900s (Bushey 1985, p. 10; Vogt 1981; Wheeling, IL, Historical Society Web site accessed 2015), and more recent examples of persecution in Pennsylvania (Jellen 2005, p. 11) and Michigan (Baily *et al.* 2011, p. 171). The process of designating critical habitat would increase human threats to the eastern massasauga rattlesnake by increasing the vulnerability of this species to unauthorized collection and trade through public disclosure of its locations. Designation of critical habitat requires the publication of maps and a specific narrative description of critical habitat in the **Federal Register**. The degree of detail in those maps and boundary descriptions is far greater than the general location descriptions provided in this proposal to list the species as a threatened species. Furthermore, a critical habitat designation normally results in the news media publishing articles in local newspapers and special interest Web sites, usually with maps of the critical habitat. We have determined that the publication of maps and descriptions outlining the locations of this species would further facilitate unauthorized collection and trade, as collectors would know the exact locations where eastern massasauga rattlesnakes occur. While eastern massasauga rattlesnakes are cryptic in coloration, they can still be collected in high numbers during certain parts of their active seasons (*e.g.,* spring egress from hibernation or summer gestation). Also, individuals of this species are often slow moving and have small home ranges. Therefore, publishing specific location information would provide a high level of assurance that any person going to a specific location would be able to successfully locate and collect specimens, given the species' site fidelity and ease of capture once located. Due to the threat of unauthorized collection and trade, a number of biologists working for State and local conservation agencies that manage populations of eastern massasauga rattlesnakes have expressed to the Service serious concerns with publishing maps and boundary descriptions of occupied habitat areas that could be associated with critical habitat designation (Redmer 2015, pers. comm.). In addition, when providing us with data on the current status of populations across the range of the species, one State agency redacted site-specific information, while others who provided the information expressed strong concerns that we should not disclose sensitive locality information. We, therefore, find that designating critical habitat could negate the efforts of State and local conservation agencies to restrict access to location information that could significantly affect future efforts to control the threat of unauthorized collection and trade of eastern massasauga rattlesnakes.

Benefits to the Species From Critical Habitat Designation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out are not likely to destroy or adversely modify critical habitat. Under the statutory provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain those physical and biological features that relate to the ability of the area to periodically support the species) to serve its intended conservation role for the species. Critical habitat only provides protections where there is a Federal nexus, that is, those actions that come under the purview of section 7 of the Act. Critical habitat designation has no application to actions that do not have a Federal nexus. Section 7(a)(2) of the Act mandates that Federal agencies, in consultation with the Service, evaluate the effects of their proposed actions on any designated critical habitat. Similar to the Act's requirement that a Federal agency action not jeopardize the continued existence of listed species, Federal agencies have the responsibility not to implement actions that would destroy or adversely modify designated critical habitat. Critical habitat designation alone, however, does not require that a Federal action agency implement specific steps toward species recovery. Eastern massasauga rattlesnakes primarily occur on non-Federal lands. The eastern massasauga rattlesnake does occur on land managed by the Service (Wisconsin), National Park Service (Indiana), U.S. Army Corps of Engineers (Illinois and Wisconsin), and U.S. Forest Service (Michigan). We anticipate that some actions on non-Federal lands will have a Federal nexus (for example, requirement for a permit to discharge dredge and fill material from the U.S. Army Corps of Engineers) for an action that may adversely affect

the eastern massasauga rattlesnake. There is also the potential that some proposed actions by the Federal agencies listed above may adversely affect the eastern massasauga rattlesnake. In those circumstances where it has been determined that a Federal action (including actions involving non-Federal lands) may affect the eastern massasauga rattlesnake, the action would be reviewed under section 7(a)(2) of the Act. We anticipate that the following Federal actions are some of the actions that could adversely affect the eastern massasauga rattlesnake: certain direct or indirect (*e.g.,* funded through Federal grants) habitat management activities such as post-emergent mowing or prescribed fire, regional flood control activities, or discharging fill material (or associated activities) into jurisdictional waters of the United States. Under section 7(a)(2) of the Act, project impacts would be analyzed and the Service would determine if the Federal action would jeopardize the continued existence of the eastern massasauga rattlesnake. The designation of critical habitat would ensure that a Federal action would not result in the destruction or adverse modification of the designated critical habitat. Consultation with respect to critical habitat would provide additional protection to a species only if the agency action would result in the destruction or adverse modification of the critical habitat but would not jeopardize the continued existence of the species. If we list the species but do not designate critical habitat, areas that support the eastern massasauga rattlesnake would continue to be subject to conservation actions implemented under section 7(a)(1) of the Act and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard, as appropriate. If we list the species, Federal actions affecting the eastern massasauga rattlesnake even in the absence of designated critical habitat areas would still benefit from consultation pursuant to section 7(a)(2) of the Act and could still result in jeopardy findings.

Another potential benefit to the eastern massasauga rattlesnake from designating critical habitat is that such a designation serves to educate landowners, State and local governments, and the public regarding the potential conservation value of an area. Generally, providing this information helps focus and promote conservation efforts by other parties by clearly delineating areas of high conservation value for the affected species. However, simply publicizing the proposed listing of the species also serves to notify and educate landowners, State and local governments, and the public regarding important conservation values. Furthermore, we have worked with State conservation agencies and the Association of Zoos and Aquariums (Eastern Massasauga Rattlesnake Species Survival Plan) to develop outreach and education materials that target a diverse audience, including public and private landowners, organizations, and the media. The eastern massasauga rattlesnake outreach actions implemented to date include producing and distributing brochures and informational Web sites, working with media outlets (newspaper and television) on eastern massasauga stories, and giving presentations to conservation agencies or the public. In addition, the Service provides a staff advisor to the Eastern Massasauga Rattlesnake Species Survival Plan, which provides a unique opportunity to help frame messaging about this species to many thousands of visitors to North American zoos. Due to the extensive outreach and conservation efforts already underway that benefit the eastern massasauga rattlesnake, we find that the designation of critical habitat would provide limited additional outreach value.

Increased Threat to the Species Outweighs the Benefits of Critical Habitat Designation

Upon reviewing the available information, we have determined that the designation of critical habitat would increase the threat to eastern massasauga rattlesnakes from persecution, unauthorized collection, and trade. We find that the risk of increasing this threat to a significant degree by publishing location information in a critical habitat designation outweighs the benefits of designating critical habitat. A limited number of U.S. species listed under the Act have commercial value in trade. The eastern massasauga rattlesnake is one of them. Due to the market demand and willingness of individuals to collect eastern massasauga rattlesnakes without authorization, and the willingness of others to kill them out of fear or wanton dislike, we have determined that any action that publicly discloses the location of eastern massasauga rattlesnakes (such as critical habitat) puts the species in further peril. Many populations of the eastern massasauga rattlesnake are small, and the life history of the species makes it vulnerable to additive loss of individuals (for example, loss of reproductive adults in numbers that would exceed those caused by predation and other non-catastrophic natural factors), requiring a focused and comprehensive approach to reducing threats. Several measures are currently being implemented to address the threat of persecution and unauthorized collection and trade of eastern massasauga rattlesnakes, and additional measures will be implemented if the species is listed under the Act. One of the basic measures to protect eastern massasauga rattlesnakes from unauthorized collection and trade is restricting access to information pertaining to the location of the species' populations. Publishing maps and narrative descriptions of eastern massasauga rattlesnake critical habitat would significantly affect our ability to reduce the threat of persecution, as well as unauthorized collection and trade. Therefore, based on our determination that critical habitat designation would increase the degree of threat to the eastern massasauga rattlesnake, and, at best, provide nominal benefits for this taxon, we find that the increased threat to the eastern massasauga rattlesnake from the designation of critical habitat significantly outweighs any benefit of designation.

Summary of Prudency Determination

We have determined that the designation of critical habitat would increase persecution, unauthorized collection, and trade threats to the eastern massasauga rattlesnake. The eastern massasauga rattlesnake is highly valued in the pet trade, and that value is likely to increase as the species becomes rarer, and as a venomous species, it also is the target of persecution. Critical habitat designation may provide some benefits to the conservation of the eastern massasauga rattlesnake, for example, by identifying areas important for conservation. We have determined, however, that the benefits of designating critical habitat for the eastern massasauga rattlesnake are minimal. We have concluded that, even if some benefit from designation may exist, the increased threat to the species from unauthorized collection and persecution outweighs any benefit to the species. A determination to not designate critical habitat also supports the measures taken by the States to control and restrict information on the locations of the eastern massasauga rattlesnake and to no longer make location and survey information readily available to the public. We have, therefore, determined in accordance with 50 CFR 424.12(a)(1) that it is not prudent to designate critical habitat for

the eastern massasauga rattlesnake. However, we seek public comment on our determination that designation of critical habitat is not prudent (see **ADDRESSES**, above, for instructions on how to submit comments).

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species 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 other countries and calls for recovery actions to be carried out for 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 calls for 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 concurrently or 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 also identifies recovery criteria for review of when a species may be ready for downlisting or delisting, 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 Chicago 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) and management, 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. If this species is listed, 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 Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, and Wisconsin would be eligible for Federal funds to implement management actions that promote the protection or recovery of the eastern massasauga rattlesnake. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Although the eastern massasauga rattlesnake is only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species 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 proposed or 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. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. 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 species' 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 Service (Upper Mississippi National Wildlife and Fish Refuge, Wisconsin), U.S. Forest Service (Huron-Manistee National Forest, Michigan), National Park Service (Indiana Dunes National Lakeshore, Indiana), or military lands administered by branches of the Department of Defense (Fort Grayling, Michigan); flood control projects (Lake Carlyle, Illinois) and 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 roads or highways by the Federal Highway Administration; construction and maintenance of pipelines or rights-of-way for transmission of electricity, and other energy related projects permitted or administered by the Federal Energy Regulatory Commission.

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 species. The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to threatened wildlife. The prohibitions of section 9(a)(1) of the Act, as applied to threatened wildlife and codified at 50 CFR 17.31, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) threatened wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to

possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

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 species, 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 proposed listing on proposed and ongoing activities within the range of the species proposed for listing. Based on the best available information, the following actions are unlikely to result in a violation of section 9, if these activities are carried out in accordance with existing regulations and permit requirements; this list is not comprehensive:

(1) Pre-emergent fire: Prescribed burns to control vegetation occurring prior to eastern massasauga rattlesnake emergence from hibernacula (typically in late March to early April); and

(2) Pre-emergent mowing: Mowing of vegetation prior to eastern massasauga rattlesnake emergence from hibernacula.

Based on the best available information, the following activities may potentially result in a violation of section 9 of the Act; this list is not comprehensive:

(1) Development of land or the conversion of native land to agricultural land, including the construction of any related infrastructure (*e.g.,* roads, bridges, railroads, pipelines, utilities) in occupied eastern massasauga rattlesnake habitat;

(2) Certain dam construction: In an area where the dam alters the habitat from native land types (*e.g.,* grassland, swamp, fen, bog, wet prairie, sedge meadow, marshland, peatland, floodplain forest, coniferous forest) causing changes in hydrology at hibernacula or where the dam causes fragmentation that separates snakes from hibernacula or gestational sites;

(3) Post-emergent prescribed fire: Prescribed burns to control vegetation that are conducted after snakes have emerged from their hibernacula and are thus exposed to the fire;

(4) Post-emergent mowing: Mowing of vegetation after snakes have emerged from hibernacula can cause direct mortality by contact with blades or being run over by tires on mower;

(5) Certain pesticide use;

(6) Water level manipulation: Flooding or hydrologic drawdown affecting eastern massasauga rattlesnake individuals or habitat, particularly hibernacula;

(7) Certain research activities: Collection and handling of eastern massasauga rattlesnake individuals for research that may result in displacement or death of the individuals; and

(8) Poaching or collecting individuals.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Chicago Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(1) Be logically organized;

(2) Use the active voice to address readers directly;

(3) Use clear language rather than jargon;

(4) Be divided into short sections and sentences; and

(5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

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 (NEPA; 42 U.S.C. 4321 *et seq.*), 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).

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 Chicago Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Chicago Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

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

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

■ 2. In § 17.11(h), add an entry for ''Rattlesnake, eastern massasauga'' to the List of Endangered and Threatened Wildlife in alphabetical order under REPTILES to read as set forth below:

§ 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	.....	.....	.....		.....	.....	.....
*	*	*	*	*	*		*
Rattlesnake, eastern massasauga.	*Sistrurus catenatus*	U.S.A. (IL, IN, IA, MI, MN, MO, NY, OH, PA, WI); Canada (Ontario).	Entire	T	.....	NA	NA
*	*	*	*	*	*		*

* * * * *

Dated: September 11, 2015.

James W. Kurth,

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

[FR Doc. 2015–24780 Filed 9–29–15; 8:45 am]

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