DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2012–0002]

[FXES11130900000C6–123–FF09E30000]

RIN 1018–AX59

Endangered and Threatened Wildlife and Plants; Removing the Magazine Mountain Shagreen from the Federal List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; availability of draft post-delisting monitoring plan.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service or USFWS), propose to remove the terrestrial snail Magazine Mountain shagreen (*Inflectarius magazinensis*; formerly *Mesodon magazinensis*) from the Federal List of Endangered and Threatened Wildlife. This proposed action is based on a thorough review of the best available

scientific and commercial data, which indicate that this species has recovered and no longer meets the definition of threatened under the Endangered Species Act of 1973, as amended (Act). Our review of the status of this species shows that all of the threats to the species have been eliminated or reduced, adequate regulatory mechanisms exist, and populations are stable so that the species is not currently, and is not likely to again become, a threatened species within the foreseeable future in all or a significant portion of its range. We seek information, data, and comments from the public regarding this proposal to delist Magazine Mountain shagreen and on the draft post-delisting monitoring plan.

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Please note that if you are using the Federal eRulemaking Portal (see **ADDRESSES**), the deadline for submitting an electronic comment is 11:59 p.m. Eastern Time on this date. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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

Electronically: Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* Search for Docket No. FWS–R4–ES–2012–0002, which is the docket number for this rulemaking. After you have located the correct docket, you may submit a comment by clicking on "Submit a Comment."

By hard copy: Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R4–ES–2012–0002; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

Copies of Documents: The proposed rule and draft post-delisting monitoring plan are available on *http://www.regulations.gov.* In addition, the supporting file for this proposed rule will be available for public inspection, by appointment, during normal business hours, at the Arkansas Ecological Services Field Office, 110 South Amity Road, Suite 300, Conway, AR 72032; telephone 501–513–4470. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Services (FIRS) at 800–877–8339.

FOR FURTHER INFORMATION CONTACT: Jim Boggs, Field Supervisor, U.S. Fish and Wildlife Service, Arkansas Ecological Services Field Office, 110 South Amity Road, Suite 300, Conway, AR 72032; telephone 501–513–4470. Individuals who are hearing-impaired or speech-impaired may call the Federal Information Relay Service (FIRS) at 800–877–8339 for TTY assistance 24 hours a day, 7 days a week.

SUPPLEMENTARY INFORMATION:

Public Comments

We intend that any final action resulting from this proposal will be based on the best available scientific and commercial data and will be as accurate and as effective as possible. Therefore, we request data, comments, and new information from other concerned governmental agencies, the scientific community, Tribes, industry, or other interested parties concerning this proposed rule. The comments that will be most useful and likely to influence our decisions are those that are supported by data or peer-reviewed studies and those that include citations to, and analyses of, applicable laws and regulations. Please make your comments as specific as possible and explain the basis for them. In addition, please include sufficient information with your comments to allow us to authenticate any scientific or commercial data you reference or provide. In particular we seek comments concerning the following:

(1) Biological data regarding Magazine Mountain shagreen.

(2) Relevant data concerning any threats (or lack thereof) to Magazine Mountain shagreen, including but not limited to:

(a) Whether or not climate change is a threat to the species;

(b) What regional climate change models are available, and whether they are reliable and credible to use as step-down models for assessing the effect of climate change on the species and its habitat; and

(c) The extent of Federal and State protection and management that would be provided to Magazine Mountain shagreen as a delisted species.

(3) Additional information concerning the range, distribution, population size, and trends of Magazine Mountain shagreen, including the locations of any additional populations of this species.

(4) Current or planned activities within the geographic range of Magazine Mountain shagreen that may affect or benefit the species.

(5) The draft post-delisting monitoring plan.

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 (16 U.S.C. 1531 *et seq*.) directs that a determination 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."

Prior to issuing a final rule on this proposed action, we will take into consideration all comments and any additional information we receive. Such information may lead to a final rule that differs from this proposal. All comments and recommendations, including names and addresses, will become part of the administrative record.

You may submit your comments and materials concerning the proposed rule by one of the methods listed in the **ADDRESSES** section. Comments must be submitted to *http://www.regulations.gov* before 11:59 p.m. (Eastern Time) on the date specified in the **DATES** section. We may not consider hand-delivered comments that we do not receive, or mailed comments that are not postmarked, by the date specified in the **DATES** section.

We will post your entire comment—including your personal identifying information—on *http://www.regulations.gov*. If you provide personal identifying information in your comment, 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.

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

Public Hearing

Section 4(b)(5)(E) of the Act provides for one or more public hearings on this proposal, if requested. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section within 45

days after the date of this **Federal Register** publication (see **DATES**). 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** at least 15 days before the first hearing.

Previous Federal Actions

On April 28, 1976, we published a proposed rule in the **Federal Register** (41 FR 17742) to list 32 snail species, including Magazine Mountain shagreen, as endangered or threatened under section 4 of the Act. However, the proposal was withdrawn in 1979 (44 FR 70796, December 10, 1979) for administrative reasons stemming from the new listing requirements of the 1978 amendments to the Act. On July 5, 1988, we published a second proposed rule in the **Federal Register** (53 FR 25179) to list Magazine Mountain shagreen as threatened. On April 17, 1989, we published a final rule in the **Federal Register** (54 FR 15206) listing Magazine Mountain shagreen as threatened. The final rule identified the following threats to Magazine Mountain shagreen: Loss of habitat due to a military proposal to conduct troop and heavy equipment movements and artillery operations on Magazine Mountain; loss of habitat due to development of a new State park on Magazine Mountain that would include construction of new buildings, roads, and trails; increased recreational use due to development of the State park; U.S. Department of Agriculture Forest Service (USFS) use of the land; and increased vulnerability to collecting and adverse habitat modification due to the species' restricted range. On February 1, 1994, we approved the Magazine

Mountain Shagreen Recovery Plan (Service 1994, 12 pp.). On July 6, 2009, we initiated a 5-year status review of this species (74 FR 31972). This rule, if finalized, would complete the status review. For additional details on previous Federal actions, see discussion under the **Recovery** section below.

Species Information

Magazine Mountain shagreen (*Inflectarius magazinensis*) is a medium-sized, dusky brown or buff-colored snail, measuring approximately 0.5 inches (in.; 13 millimeters (mm)) wide and 0.3 in. (7 mm) high. Magazine Mountain shagreen was originally described as a subspecies of *Polygyra edentatus* (Pilsbry and Ferriss 1907, p. 545). In 1940, Pilsbry (1940 in Service 1994, p. 1) placed the snail into the genus *Mesodon* and elevated it to the status of a species based on genitalia. In 1991, Emberton (1991, p. 90) showed there were internal genitalic differences among *Mesodon* species and placed Magazine Mountain shagreen in the genus *Inflectarius*, thereby removing it from *Mesodon*. The morphology of Magazine Mountain shagreen has been summarized by Caldwell *et al.* (2009, p. 2). While the taxonomic name has changed since it was listed in 1989, Magazine Mountain shagreen has not been split from or combined with any other land snail species or subspecies. The entity that is now called *Inflectarius magazinensis* is the same entity that was known as *Mesodon magazinensis*.

Magazine Mountain shagreen is historically known from only the north slope of Magazine Mountain, Logan County, Arkansas (Pilsbry and Ferriss 1907, p. 545;

Caldwell *et al.* 2009, p. 4). The south slopes of Magazine Mountain were surveyed extensively by Caldwell (1986 in Service 1994, p. 3) and Caldwell *et al.* (2009, p. 4), but they did not find Magazine Mountain shagreen on the south slopes. Populations occur in the portion of talus (a sloping mass of loose rocks) covered by vegetation or leaf litter at an elevation of 2,200 feet (ft) (670.6 meters (m)) to 2,600 ft (792.5 m) in the Savanna Sandstone formation calved (broken off or splintered into pieces) due to weathering and erosion of interbedded shales (Caldwell *et al.* 2009, p. 4; Service 1994, p. 3). The majority of talus is above 2,200 ft (670.6 m) elevation on the north and west slopes, with Magazine Mountain shagreen populations occurring between 2,400 ft (731.5 m) and 2,600 ft (792.5 m). In the north slope of Bear Hollow, the talus begins at approximately 2,200 ft (670.6 m) and in some calved areas extends to near 2,265 ft (690.4 m) elevation. In Bear Hollow, Magazine Mountain shagreen is restricted to the upper vegetated elevation end of this talus range (Caldwell *et al*. 2009, pp. 4–5).

The rocky slopes formed by the removal of softer, more easily eroded shale on the steep slopes cause the more resistant sandstone capping Magazine Mountain to break off and accumulate along the flanks. This provides the ideal habitat for Magazine Mountain shagreen (Cohoon and Vere 1988 in Caldwell *et al*. 2009, p. 6). The total amount of available habitat for Magazine Mountain shagreen consists of approximately 21.6 acres (ac; 8.75 hectares (ha)) at 27 talus habitats on Magazine Mountain's west and north slopes (Caldwell *et al*. 2009, pp. 4–5).

The geology and forest community of Magazine Mountain were summarized by Caldwell *et al*. (2009, pp. 4–12). The average annual temperature is 5.9 degrees Fahrenheit (°F; 3.3 degrees Celsius (°C)) cooler on the summit than surrounding areas, and mid-summer temperatures are frequently 10 to 25 °F (5.6 to 13.9 °C) cooler. The mean annual precipitation at the summit of Magazine Mountain is 55 in. (139.7 centimeters (cm)), approximately 5 in. (12.7 cm) greater than the lower elevations. The USFS and Arkansas Department of Parks and Tourism (ADPT) own all lands on Magazine Mountain (Service 1994, p. 3).

Little information is available on land snail associations (*e.g.*, presence/absence of other land snails to predict habitat quality or occurrence of Magazine Mountain shagreen). Caldwell *et al*. (2009, pp. 13–14) determined the relative abundance (number of a particular species as a percentage of the total population of a given area) of species found with Magazine Mountain shagreen. Land snails such as the blade vertigo (*Vertigo milium*) and pale glyph (*Glyphyalinia lewisiana*) were found only on the south slope talus, while the oakwood liptooth (*Millerelix dorfeuilliana*) and immature Succineidae species were found on the north slope talus. Thus, presence of oakwood liptooth and immature Succineidae in habitats suitable for Magazine Mountain shagreen may predict its occurrence despite negative survey results.

Caldwell *et al*. (2009, pp. 15–16) presented the only information on life history and reproductive biology for Magazine Mountain shagreen (see **Recovery** section below). They also presented the first report on food habits for Magazine Mountain

shagreen (Caldwell *et al*. 2009, p. 16). Magazine Mountain shagreen was found during night feeding on oak catkins (flowers), algae-covered rocks, and decaying white oak (*Quercus alba*) leaves. It has generalist feeding habits (able to utilize many food sources) similar to other land snails in the taxonomic family Polygyridae (Blinn 1963, pp. 501–502; Foster 1936, pp. 26–31; Dourson 2008, pp. 155–156; Caldwell *et al*. 2009, p. 16). Thus, food source probably is not a limiting factor for Magazine Mountain shagreen (Caldwell *et al*. 2009, p. 16).

Caldwell *et al*. (2009, p. 15) found no significant differences for ground, atmospheric, and rock crevice maximum temperatures between south and north slopes. They did, however, find significant differences for minimum temperatures. Ground, atmospheric, and rock crevice minimum temperatures were 5.6, 5.2, and 3.6 °F (3.1, 2.9 and 2.0 °C) cooler, respectively, on the north slopes than on the south slopes. Prolonged drought or concomitant warming of temperatures could adversely affect this species by compromising nesting sites, egg masses, and surface feeding (Caldwell *et al*. 2009, p. 15). However, there is no data to establish that such effects are reasonably certain to occur.

Recovery

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species.

Recovery plans are not regulatory documents and are instead intended to establish goals for long-term conservation of listed species, define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act, and provide guidance to our Federal, State, other governmental and non-governmental partners on methods to minimize threats to listed species. There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met. For example, one or more criteria may be exceeded while other criteria may not yet be accomplished. In that instance, we may determine that the threats are minimized sufficiently and the species is robust enough to delist. In other cases, recovery opportunities may be discovered that were not known when the recovery plan was finalized. These opportunities may be used instead of methods identified in the recovery plan. Likewise, information on the species may be learned that was not known at the time the recovery plan was finalized. The new information may change the extent that criteria need to be met for recognizing recovery of the species. Recovery of a species is a dynamic process requiring adaptive management that may, or may not, fully follow the guidance provided in a recovery plan.

The Magazine Mountain Shagreen Recovery Plan was approved by the Service on February 1, 1994 (Service 1994, 12 pp.). The recovery plan includes the following delisting criteria:

- Magazine Mountain shagreen will be considered recovered when long-term

protection of its habitat is achieved; and

- It is determined from 10 years of data that the snail population is stable or increasing.

Long-term protection of habitat will be achieved when a memorandum of understanding (MOU) between the USFS and the Service is developed and implemented. The MOU must delineate measures protecting the species and its habitat, must be continuous in effect, and must require a minimum 2-year written notification prior to cancellation by either party. Criteria for determining what constitutes a stable population were to be determined through implementation of recovery actions (Service 1994, p. 6). Through implementation of these actions, the criteria chosen as the most appropriate for determining a stable population were persistence over time (shown by the number of Magazine Mountain shagreen individuals collected annually), annual catch per unit effort, and size, quality, and stability of habitat.

The recovery plan outlines six primary recovery actions to meet the recovery criteria described above and therefore address threats to the species. The six recovery actions for delisting Magazine Mountain shagreen have been met, as described below. Additionally, the level of protection currently afforded to the species and its habitat and the current status of threats are outlined in the **Summary of Factors Affecting the Species** section below.

Recovery Action 1: Provide long-term protection for Magazine Mountain shagreen through a memorandum of understanding (MOU) between the USFS and the Service to protect habitat.

To meet the recovery criterion to provide long-term habitat protection for Magazine Mountain shagreen, in 2005, the Service, USFS Ozark-St. Francis National Forest, and ADPT entered into a MOU that provides for long-term cooperation in the management and protection of the species and its habitat on Magazine Mountain. The MOU is a continuing agreement without a designated termination date. Additionally, the USFS designated Magazine Mountain as a Special Interest Area in the 2005 Revised Land Resource Management Plan (USFS 2005, p. 2–43). The Special Interest Area designation prohibits timber harvest, prescribed burning from leaf fall until the end of Magazine Mountain shagreen's reproductive period, application of aerial fire retardant, road construction, and recreational development on talus slopes. Therefore, through development and implementation of the MOU and Special Interest Area, we consider this action complete.

Recovery Action 2: Determine and monitor population parameters, including mapping and monitoring the distribution of Magazine Mountain shagreen and its habitat and designing and implementing a standard survey procedure.

Surveys: In developing the monitor strategy for Magazine Mountain shagreen, 10 specific sampling stations were established in 1996; these sampling stations later served

as the long-term monitoring locations for the USFS. Each station was marked with permanent markers so that later annual monitoring effort could be repeated at the exact location (Robison 1996, p. 6). The survey protocol uses visual encounter searches (VES) to determine, map, and monitor Magazine Mountain shagreen population parameters and habitat (Robison 1996, pp. 7–24). VES involves field personnel walking through an area or habitat for a prescribed time period systematically searching for animals and has been used effectively with amphibians in habitats that are widely spaced, such as the talus slopes that Magazine Mountain shagreen inhabits (Crump and Scott 1994 in Robison 1996, pp. 8–9). The assumption of VES is that the shorter duration in time to encounter an animal, the more common and abundant the animal is at any particular site (Robison 1997, p. 7).

Historic surveys for Magazine Mountain shagreen prior to development of the 1994 Recovery Plan were limited to two surveys: (1) A 1903 collection of 114 live specimens and one dead specimen from the north and south slopes of Magazine Mountain (Pilsbry and Ferriss 1906, p. 545), and (2) a comprehensive status review by Caldwell (1986). The specimen collected in 1903 on the south slope has never been verified as Magazine Mountain shagreen by other researchers (Robison 1996, p. 3). Neither survey reported population estimates nor catch per unit effort. Therefore, it is not possible to make a comparative analysis of these collections to subsequent collections that reported number of live and dead snails per search time (see discussion below).

In 1996, two surveys were conducted for Magazine Mountain shagreen at each of the 10 sampling stations (Table 1; Robison 1996, pp. 17–20). Using VES, live Magazine Mountain shagreen were found at four sampling stations on May 24–27, 1996, and four stations on June 6–8, 1996 (Table 1; Robison 1996, p. 19). At all sites, dead Magazine Mountain shagreen shells were encountered before live individuals were discovered (Table 1). Magazine Mountain shagreen shell size was comparable between 1986 and 1996: Mean height/width ratio was 0.55 (range 0.52–0.59, N = 18; Caldwell 1986) and 0.56 (range 0.50–0.61, N = 25; Robison 1996, p. 38), respectively.

Table 1. Results of timed searches conducted in 1996 and 1997 at 10 Magazine Mountain shagreen (MMS) monitoring stations on Magazine Mountain, Logan County, Arkansas (Robison 1996, pp. 33–35; Robison 1997, pp. 16–17). Time is reported in minutes to first encounter. The number of individuals collected is for a 60-minute search period or number of individuals per hour at each station (catch per unit effort).

Station	Dead MMS Shell						Live MMS					
	24-27 May 1996		6-8 June 1996		19-20 May 1997		24-27 May 1996		6-8 June 1996		19-20 May 1997	
	Number	Time (min)	Number	Time (min)	Number	Time (min)	Number	Time (min)	Number	Time (min)	Number	Time (min)
1	0	0	0	0	0	0	0	0	0	0	0	0
2	1	11	1	10	0	0	0	0	0	0	0	0
3	5	6	0	0	3	8	3	7	0	0	2	13
4	3	5	2	7	1	9	0	0	0	0	0	0
5	3	16	4	12	2	17	2	18	2	18	1	30
6	2	4	1	9	4	8	2	12	1	10	1	19
7	2	12	2	6	1	14	0	0	1	9	1	46
8	3	4	2	7	0	0	1	9	2	13	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
Total # of individuals or shells	19	------	12	------	11	------	8	-------	6	-------	5	------
Average time to	------	8.3	------	8.5	------	11.2	------	11.5	------	12.5	------	27

encounter												

A third survey was conducted by Robison in May 1997 (Table 1; Robison 1997, pp. 16–17). Live individuals and dead shells were found at four and five sampling stations, respectively (Table 1). Magazine Mountain shagreen shell size (height/width ratio) in 1997 was within the range of shell size measurements collected during the 1986 (Caldwell 1986) and 1996 (Robison 1996, p. 38) surveys.

The USFS conducted Magazine Mountain shagreen population monitoring from 1998 through 2011 using the same sampling protocols and 10 stations established by Robison (1996). Station 10 was dropped from surveys in 2002, with Service approval, as no live or dead Magazine Mountain shagreen had been collected at this station during any previous surveys. One person hour (60 minutes) per station was spent searching for Magazine Mountain shagreen for all survey years (1998–2011, except during 2000, when no surveys were conducted, and during 2007, when three stations were not sampled). The number of live and dead Magazine Mountain shagreen collected at each station from 1998–2011 are shown in Table 2. The amount of time (minutes) that elapsed until the first encounter of live and dead Magazine Mountain shagreen at each station from 1998–2011 are shown in Table 3.

Table 2. Number of individuals located during 60-minute search periods at 10 Magazine Mountain shagreen (MMS) monitoring stations on Magazine Mountain, Logan County, Arkansas, from 1998 to 2011 (USFS unpublished data sheets 1999–2011, USFS 2009). The number of individuals collected is for a 60-minute search period or number of individuals per hour at each station (catch per unit effort). D = dead shells; L = live snails; NS = not sampled; NR = not recorded; DM = data missing from USFS files.

Station	Dead(D) or Live (L)	Year														
		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	1998-2011
1	D	0	0	NS	1	0	0	0	0	0	NR	0	0	0	0	1
	L	0	1	NS	0	2	0	1	2	0	2	0	0	0	0	8
2	D	0	1	NS	0	0	0	0	2	DM	NR	0	0	0	0	3
	L	0	0	NS	0	0	0	1	0	DM	2	0	0	0	0	3
3	D	0	0	NS	1	0	0	0	0	0	NS	0	0	0	0	1
	L	0	0	NS	0	0	0	0	0	0	NS	0	0	0	0	0
4	D	2	1	NS	2	0	1	1	0	0	NR	1	1	1	0	10
	L	1	0	NS	0	0	0	0	0	0	1	2	0	0	0	4
5	D	0	0	NS	1	1	1	3	0	0	NS	1	3	5	0	15
	L	1	1	NS	1	0	0	3	3	2	NS	3	0	0	1	15
6	D	2	0	NS	3	0	0	4	NR	0	NR	0	1	4	0	14
	L	2	0	NS	2	0	2	3	4	1	1	0	0	0	0	15
	D	4	0	NS	0	0	0	1	0	DM	0	0	0	1	0	6

7	L	0	0	NS	0	0	0	0	2	DM	1	0	0	0	3	6
8	D	0	0	NS	0	0	1	0	0	0	NS	1	1	2	0	5
	L	0	0	NS	0	0	0	1	2	0	NS	1	0	0	0	5
9	D	0	0	NS	0	0	0	0	0	0	NR	0	0	0	0	0
	L	0	0	NS	0	2	0	0	0	1	1	0	0	0	0	4
10	D	0	0	NS	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0
	L	0	0	NS	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0
Totals	D	8	2	NS	8	1	3	9	2	0	NR/NS	3	6	13	0	55
	L	4	2	NS	3	4	2	9	13	4	8	6	0	0	4	59
	D + L	12	4	NS	11	5	5	18	15	4	8	9	6	13	4	114

Table 3. Minutes to first encounter of Magazine Mountain shagreen individual. Results of timed searches conducted by the USFS at 10 Magazine Mountain shagreen (MMS) monitoring stations on Magazine Mountain, Logan County, Arkansas, from 1998 to 2011 (USFS unpublished data sheets 1999–2011, USFS 2009). Numbers reported are for time (minutes) to first encounter of a dead shell or live snail. Timed searches were conducted for 60 minutes at each station in each year, except where otherwise indicated. D = dead shells; L = live snails; NS = not sampled; NR = not recorded; DM = data missing from USFS files.

Station	Dead(D) or Live (L)	Year													
		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1	D	0	0	NS	30	0	0	0	0	0	NR	0	0	0	0
	L	0	11	NS	0	8	0	10	1	0	16	0	0	0	0
2	D	0	42	NS	0	0	0	0	10	DM	59	0	0	0	0
	L	0	0	NS	0	0	0	37	0	DM	44	0	0	0	0
3	D	0	0	NS	42	0	0	0	0	0	NS	0	0	0	0
	L	0	0	NS	0	0	0	0	0	0	NS	0	0	0	0
4	D	12	1	NS	52	0	14	15	0	0	NR	55	55	20	0
	L	18	0	NS	0	0	0	0	0	0	50	30	0	0	0
5	D	0	0	NS	12	2	1	30	0	0	NS	1	8	50	0
	L	36	27	NS	2	0	0	32	13	21	NS	30	0	0	60
6	D	45	0	NS	8	0	0	26	6	0	NR	0	42	3	0
	L	16	0	NS	2	0	10	26	10	19	1	0	0	0	0

7	D	53	0	NS	0	0	0	31	0	DM	0	0	0	29	0
	L	0	0	NS	0	0	0	0	3	DM	11	0	0	0	20
8	D	0	0	NS	0	0	6	0	0	0	NS	55	50	12	0
	L	0	0	NS	0	0	0	32	1	0	NS	50	0	0	0
9	D	0	0	NS	0	0	0	0	0	0	NR	0	0	0	0
	L	0	0	NS	0	1	0	0	0	18	7	0	0	0	0
10	D	0	0	NS	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	L	0	0	NS	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Average Time to Encounter	D	37	22	NS	29	2	7	26	8	0	59	37	39	29	0
	L	23	19	NS	2	5	10	27	6	19	22	37	0	0	40

Overall, the number of live Magazine Mountain shagreens collected annually from 1996–2011 indicates the species is persisting over time. Annual fluctuation in numbers of live Magazine Mountain shagreens collected is likely attributable to climatic or temporal conditions or both (Tables 1, 2, and 3). For example, monitoring conducted in mid-June 2009 yielded zero live Magazine Mountain shagreen. However, June 2009 was considerably drier than May 2009 (95 mm versus 301 mm monthly rainfall, respectively; 5 versus 13 days with rainfall, respectively) and likely explains the lack of live specimens observed during the survey, because the snails are more active during times of high humidity and cooler temperatures (USFS 2009, pp. 1, 4–5).

The number of dead Magazine Mountain shagreens collected annually from 1996–2011 has shown greater annual fluctuation than the number of live individuals (Tables 1, 2, and 3). A closely related species, shagreen (*Inflectarius inflectus*), is slightly smaller than Magazine Moutain shagreen with a "greater diameter" ranging from 0.37 (9.5 mm) to 0.44 in. (11.3 mm) (mean = 0.43 in. (10.9 mm)) compared to 0.50 (12.7 mm) to 0.55 in. (14.0 mm) (mean = 0.52 in. (13.3 mm)) for Magazine Mountain shagreen (Caldwell *et al.* 2009, p. 2). However, individuals of shagreen (*Inflectarius inflectus*), on which aperture (the main opening of the snail's shell) teeth are reduced, look very similar to Magazine Mountain shagreen. Therefore, accurate identification of dead Magazine Mountain shagreen, and to a much lesser extent live individuals, may be easily confused with the more common and abundant shagreen depending on surveyor experience, which has been variable during the 16-year monitoring period.

There are numerous problems with sampling populations of terrestrial snails, including their rupicolous nature (living or growing on or among rocks), which makes it difficult to locate individuals during surveys; effects of climate variables (*e.g.*, temperature and humidity) on snail activity; and practicality of surveys for nocturnal species such as Magazine Mountain shagreen (Newell 1971 and Bishop 1977 in Robison 1996, p. 7). Surveys are optimally conducted at night in late April to early May, dependent upon the onset of spring (moister conditions at the surface, emergence of oak catkins, temperature) (Caldwell *et al.* 2009, p. 17). A rise in relative humidity and drop in temperature usually causes land snails to become more active (Burch and Pearce 1990 in Robinson 1996, p. 7). Therefore, climatic and temporal variation may explain variation in number of live specimens collected from one survey to the next.

Population size, density, and age structure cannot be reliably estimated for a rupicolous species that spends most of the year deep within the talus slopes of Magazine Mountain (Caldwell *et al.* 2009, p. 4). Therefore, these population parameters were not estimated.

Habitat mapping: All talus habitats inhabited by Magazine Mountain shagreen were assessed and spatially mapped in 2007–2008 (see **Species Information**; Caldwell *et al.* 2009, pp. 23–31). According to that assessment, the total amount of available habitat for Magazine Mountain shagreen consists of approximately 21.6 ac (8.75 ha) at 27 talus habitats on Magazine Mountain's west and north slopes (Caldwell *et al*. 2009, pp. 4–5). The only other habitat assessment for Magazine Mountain shagreen was conducted in

1986, during a comprehensive status review (Caldwell 1986). In 1986, total habitat available to the species was estimated at 540 ac (218.5 ha). No habitat loss has occurred since 1986, but rather more advanced technology using global positioning satellite mapping of talus habitat and detailed analysis of vegetative communities and climatic variables provided a more accurate assessment of the species' habitat.

Summary of Recovery Action 2: As specified in the recovery plan and discussed above, Robison (1996) developed a standardized monitoring strategy for the USFS, and using that strategy, Magazine Mountain shagreen populations have been monitored annually since 1996. Despite variable climatic and temporal conditions preceding annual population monitoring, 16 years of monitoring data appear to indicate a stable Magazine Mountain shagreen population (Tables 1, 2, and 3), as shown by the species' persistence over time and stability of habitat. Surveys conducted by Caldwell *et al.* (2009) from 2007–2008 reaffirmed USFS monitoring results. In addition, as discussed above, all talus habitats inhabited by Magazine Mountain shagreen were mapped. Therefore, we consider this recovery action complete.

Recovery Action 3: Develop life-history and habitat parameters.

The first life-history and ecology information for Magazine Mountain shagreen, including information on habitat (geology and forest community), associations with other land snails, food habits, activity periods, breeding, egg deposition and hatching times,

growth rates, and limiting factors, was provided in 2009 as a result of surveys conducted by Caldwell *et al.* (2009).

Magazine Mountain shagreen prefers moist woods with some noteworthy differences in the tree and shrub communities present on the north and south slopes of Magazine Mountain (Caldwell *et al.* 2009). Trees such as American linden (*Tilia americana*), sugar maple (*Acer sacccharum*), white ash (*Fraxinus americana*), and prickly gooseberry (*Ribes cynosbati*) were found only on the north slopes of Magazine Mountain (Caldwell *et al.* 2009, pp. 6–11). Similar associations with land snails are discussed in the **Species Information** section.

In 1986, Caldwell (1986) failed to find Magazine Mountain shagreen egg masses, but he suspected that eggs were laid deep within the talus (Service 1994, p. 3). Caldwell *et al*. (2009, p. 15–16) located Magazine Mountain shagreen egg masses the second week of May 2007 concurrent with spring rain. The egg masses were not laid deep within the talus as previously hypothesized but were found in the leaf litter covering the talus. Temperatures of the substrate and rock were 63.7 and 64.2 °F (17.6 and 17.9 °C), respectively.

Caldwell *et al*. (2009, p. 15) collected one egg mass containing 13 eggs (diameter 0.1 in. or 2.7 mm) and successfully hatched and reared Magazine Mountain shagreen juveniles in a terrarium at room temperature (73 °F or 23 °C). Ten of 13 eggs hatched

after a 5-week incubation period. Magazine Mountain shagreen young hatched at a size of 0.1 in. (3.5 mm).

No live Magazine Mountain shagreen individuals or egg masses were located from June through March during the 2-year survey. Therefore, Caldwell *et al*. (2009, p. 16) suspected that Magazine Mountain shagreen lay eggs only during early spring (late April to early May) and that egg-laying is triggered by spring rains. They noted that the first onset of oak catkins (flowers) concurrent with rain events serves as a visual cue to locate live individuals and egg masses.

As discussed above, Caldwell *et al.* (2009) provide the first life-history and ecology information for Magazine Mountain shagreen. Therefore, we consider this action complete.

Recovery Action 4: Determine the parameters of a stable population.

Due to the rupicolous nature (living or growing on or among rocks) of Magazine Mountain shagreen, it is not possible to estimate population size or age structure. The size and quality of habitat available to Magazine Mountain shagreen was defined by Caldwell *et al.* (2009, p. 4) (see **Species Information**). While this estimate is substantially less than that estimated by Caldwell (1986; see **Species Information**), it represents a much more rigorous analysis of available habitat using geospatial mapping software to map habitat based on geology, forest community, and species survey data. It

is our opinion based on the Caldwell *et al*. (2009) data and protections afforded Magazine Mountain from the USFS and ADPT that habitat quantity and quality have remained stable since listing in 1989, and threats to habitat identified at listing (see **Previous Federal Actions**) are no longer threats. In addition, monitoring data collected since 1996 by Robison (1996, 1997), USFS (1998–2011), and Caldwell *et al.* (2009) show that the species is persisting over time despite low numbers of live/dead Magazine Mountain shagreen observed annually (see Tables 1, 2, and 3). Finally, permanent protection and management of habitat supporting Magazine Mountain shagreen on Magazine Mountain indicate that populations are secure and should remain self-sustaining for the foreseeable future. Therefore, we consider this action complete.

Recovery Action 5: Conduct surveys of potential habitat in the vicinity of Magazine Mountain.

Magazine Mountain shagreen surveys have been conducted in similar talus habitats near Magazine Mountain (Caldwell *et al.* 2009, pp. 2–6). These surveys were conducted in the Arkansas River Valley and areas north of the Arkansas River. Mount Nebo and Petit Jean Mountain were chosen for more intensive surveys in 2007 and 2008. Maximum elevation of Petit Jean Mountain (1,180 ft or 359.7 m) and Mount Nebo (1,755 ft or 534.9 m) is less than the minimum elevation (2,200 ft or 670.6 m) of talus habitat occupied by Magazine Mountain shagreen at Magazine Mountain. Mean average rainfall at the summit of Magazine Mountain is 55 in. (139.7 cm), approximately 5 in. (12.7 cm) greater than lower elevations (Service 1994, p. 3). Forest communities of Mount Nebo

more closely resemble the south slope of Magazine Mountain, which is not inhabited by Magazine Mountain shagreen. Therefore, the unique combination of biotic and abiotic differences between Magazine Mountain's north and west slopes and other mountains in the Arkansas River Valley (Mount Nebo and Petit Jean Mountain) provide a unique habitat for the endemic Magazine Mountain shagreen (Caldwell *et al.* 2009, pp. 4–6).

Because surveys of potential habitat near Magazine Mountain have been conducted, we consider this action complete.

Recovery Action 6: Develop a monitoring plan to ensure recovery has been achieved.

In conjunction with this proposed rule, we have developed a draft post-delisting monitoring plan (see **Post-Delisting Monitoring** section below) that includes information on distribution, habitat requirements, and life history of Magazine Mountain shagreen and a monitoring protocol provided by Caldwell *et al.* (2009, pp. 17–18). Therefore, we consider this action complete.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing, reclassifying, or removing species from the Federal Lists of Endangered and Threatened Wildlife and Plants. "Species" is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct

vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). Once the "species" is determined, we then evaluate whether that species may be endangered or threatened because of one or more of the five factors described in section 4(a)(1) of the Act. We must consider these same five factors in reclassifying or delisting a species. We may delist a species according to 50 CFR 424.11(d) if the best available scientific and commercial information indicates that the species is neither endangered nor threatened for the following reasons: (1) The species is extinct; (2) the species has recovered and is no longer endangered or threatened; and/or (3) the original scientific data used at the time the species was classified were in error.

Under section 3 of the Act, a species is "endangered" if it is in danger of extinction throughout all or a "significant portion of its range" and is "threatened" if it is likely to become endangered within the foreseeable future throughout all or a "significant portion of its range." The word "range" refers to the range in which the species currently exists, and the word "significant" refers to the value of that portion of the range being considered to the conservation of the species. The "foreseeable future" is the period of time over which events or effects reasonably can or should be anticipated, or trends extrapolated. A recovered species is one that no longer meets the Act's definition of endangered or threatened. Determining whether or not a species is recovered requires consideration of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as endangered or threatened, the analysis for a delisting due to recovery must include an evaluation of the threats that existed at the time of listing, the threats currently facing the species, and the threats that are reasonably likely

to affect the species in the foreseeable future following the downlisting or delisting and the removal of the Act's protections.

The following analysis examines all five factors currently affecting or that are likely to affect Magazine Mountain shagreen within the foreseeable future. In making this final determination, we have considered all scientific and commercial information available, which includes monitoring data collected from 1996 to 2011 (Robison 1996, USFS 2009) and life-history and habitat information (Caldwell *et al.* 2009).

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

The 1989 final rule to list Magazine Mountain shagreen as threatened (54 FR 15206) identified the following habitat threats: Possible negative effects from USFS use of the land, a military proposal that would bring troop training exercises and heavy equipment into the species' habitat, and the development of a new State park and lodge on Magazine Mountain.

The 1989 final listing rule cited the species' restricted range as its greatest vulnerability to land use change or activity that would modify the talus slopes inhabited by the species. A request from the ADPT for a special use permit from the USFS to develop a State park and the associated construction of buildings, roads, trails, pipelines, and recreational activities had the potential to adversely affect Magazine Mountain

shagreen and its habitat if talus slopes were disturbed. In 1993, several agencies, including the Service, contributed to an environmental impact statement (EIS) for the development and construction of a State park on the summit of Magazine Mountain (Service 1994, p. 5). Of the five assessed alternatives, the selected alternative included construction of facilities on the south slopes, improvement of existing camping and picnic facilities on the north slopes, additional hiking trails, and a reconstructed homestead. However, it was determined that, with appropriate management, the selected alternative would not adversely affect Magazine Mountain shagreen. Furthermore, mitigation measures completed as part of the park development and maintenance that helped minimize potential adverse effects to Magazine Mountain shagreen and its habitat included development of a revegetation/erosion/sediment control plan, monitoring of sensitive species habitats, and reduction of foot traffic along bluff lines and rock outcrops. Therefore, development of the State park and its associated recreational and maintenance activities no longer poses a threat to the survival of Magazine Mountain shagreen.

Since the final listing rule was published, the USFS Ozark-St. Francis National Forests have designated the north and west slopes of Magazine Mountain above the 1,600 ft (487.7 m) contour interval as a Special Interest Area. This designation encompasses all of the known range of Magazine Mountain shagreen plus a 600-ft (182.9-m) contour interval buffer. The Special Interest Area designation also protects the area from land management practices that might be detrimental to Magazine Mountain shagreen and its habitat. We expect that the delisting of Magazine Mountain shagreen would not weaken

USFS's commitment to the conservation of the Special Interest Area. In 2005, the Service, USFS Ozark-St. Francis National Forests, and ADPT entered into a MOU that provides for long-term cooperation in the management and protection of Magazine Mountain shagreen and its habitat on Magazine Mountain. The MOU is a continuing agreement without a designated termination date. Therefore, USFS land use activities no longer pose a threat to the survival of Magazine Mountain shagreen.

Wildfires have been cited as the single greatest threat to Magazine Mountain shagreen (Caldwell *et al.* 2009, p. 18). The USFS's prescribed fire program and its associated timing and frequency will reduce the likelihood of catastrophic wild fires. The prescribed fire program also provides a buffer around Magazine Mountain shagreen habitat. The ADPT restricts campfires and open flame cooking to designated areas to minimize the potential for wild fires that may potentially threaten Magazine Mountain shagreen and its habitat, as well as State park buildings and structures.

The U.S. Army is no longer considering the use of Magazine Mountain for military training exercises, an activity that was considered an imminent threat to Magazine Mountain shagreen when it was listed. The U.S. Army has no plans to conduct military training exercises on Magazine Mountain in the foreseeable future and withdrew its previous consideration after Magazine Mountain shagreen was listed as threatened in 1989 (Service 1994, p. 5). Therefore, potential U.S. Army military training operations no longer pose a threat to the survival of Magazine Mountain shagreen.

Summary of Factor A: Through management agreements and special designations, habitat supporting Magazine Mountain shagreen on Magazine Mountain is secure, and self-sustaining populations will remain permanently protected and managed to maintain talus habitat. Therefore, we find that the present or threatened destruction, modification, or curtailment of its habitat or range is no longer a threat to Magazine Mountain shagreen.

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

The final rule to list Magazine Mountain shagreen identified overutilization as a potential threat. A knowledgeable collector could adversely affect the population by removing large numbers of individuals. However, to the Service's knowledge, no Magazine Mountain shagreen individuals have been removed from the population for commercial, recreational, scientific, or educational purposes since the species was listed in 1989, except by Caldwell *et al.* (2009), who were permitted through a section 10(a)(1)(A) research permit to remove an egg mass from the wild to learn more about the life history of Magazine Mountain shagreen. The Arkansas Game and Fish Commission (AGFC) requires a permit for collection of individuals for scientific and educational purposes. Recreational collection is not permitted. Likewise, ADPT requires a permit for collection of plants and animals within State park boundaries. The boundary of Magazine Mountain State Park encompasses the top of Magazine Mountain and includes a small portion of the upper talus inhabited by Magazine Mountain shagreen. The State

park is managed by ADPT under a special use agreement from, and in concert with, the USFS Ozark National Forest, and the park conserves 2,234 ac (904 ha) of Magazine Mountain's oak-hickory and pine-covered, plateau-like summit. There is no commercial market for Magazine Mountain shagreen, nor is there likely to be a commercial market in the foreseeable future. It is the Service's opinion that, due to the species' restricted range, the AGFC's and ADPT's permitting requirements and restrictions will provide sufficient protection to Magazine Mountain shagreen following delisting. Therefore, overutilization for commercial, recreational, scientific, and educational purposes no longer poses a threat to Magazine Mountain shagreen.

Summary of Factor B: Magazine Mountain shagreen is not sought after for commercial purposes, and recreational collection of animals and plants within Magazine Mountain State Park is prohibited. The AGFC requires a scientific collection permit for scientific, recreational, and educational purposes, and it is the Service's opinion that it is very unlikely that AGFC would permit any activity that would result in overutilization of Magazine Mountain shagreen. Therefore, we find that overutilization for commercial, recreational, scientific, or educational purposes is no longer a threat to Magazine Mountain shagreen and will not become a threat in the foreseeable future.

Factor C. Disease or Predation

The 1989 listing rule for Magazine Mountain shagreen (54 FR 15206) did not list any threats to the species from disease or predation. The best available science does

not provide any evidence that either of these factors has become a threat to this species since it was listed in 1989, nor will either become a threat in the foreseeable future. Therefore, we find that disease and predation are not threats to Magazine Mountain shagreen.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

The 1989 final rule to list Magazine Mountain shagreen (54 FR 15206) indicated that no protections other than the USFS Special Interest Area existed to protect Magazine Mountain shagreen and its habitat. The entire range of Magazine Mountain shagreen is now on USFS or ADPT property. Collection of animals is prohibited in the State park, and there is no indication that this prohibition is not effective in preventing collection of this species. In 2005, the Service, USFS Ozark-St. Francis National Forest, and ADPT entered into a MOU that provides for long-term cooperation in the management and protection of Magazine Mountain shagreen and its habitat on Magazine Mountain. The MOU is a continuing agreement without a designated termination date.

Summary of Factor D: We believe that the protected status of the lands where Magazine Mountain shagreen currently exists will continue to provide adequate regulatory protection for this species. Therefore, we find that lack of regulatory protection is no longer a threat to Magazine Mountain shagreen.

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

The 1989 final listing rule for Magazine Mountain shagreen (54 FR 15206) identified the restricted range (Magazine Mountain), temperature, and moisture as potential stressors to Magazine Mountain shagreen. Magazine Mountain shagreen inhabits 27 talus habitats on the north and west slopes of Magazine Mountain, Logan County, Arkansas. Populations occur in the vegetated and leaf litter covered portion of talus rock between 2,200 ft (670.6 m) and 2,600 ft (792.5 m). However, as a result of habitat protection provided by the USFS and ADPT (see analysis under Factors A and D above), vulnerability associated with restricted range is no longer a threat.

The Intergovernmental Panel on Climate Change (IPCC) concluded that evidence of warming of the climate system is unequivocal (IPCC 2007a, p. 30). Numerous long-term climate changes have been observed, including changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves, and the intensity of tropical cyclones (IPCC 2007b, p. 7). While continued change is certain, the magnitude and rate of change is unknown in many cases. Species that are dependent on specialized habitat types, limited in distribution, or that have become restricted to the extreme periphery of their range will be most susceptible to the effects of climate change.

Estimates of the effects of climate change using available climate models lack the geographic precision needed to predict the magnitude of effects at a scale small enough to discretely apply to the range of Magazine Mountain shagreen. However, data on recent

trends and predicted changes for the Southeast United States (Karl *et al.* 2009, pp. 111-116) provide some insight for evaluating the potential threat of climate change to Magazine Mountain shagreen. Since 1970, the average annual temperature of the region has increased by about 2 ^{o}F (1.1 ^{o}C), with the greatest increases occurring during winter months. The geographic extent of areas in the Southeast region affected by moderate to severe spring and summer drought has increased over the past three decades by 12 and 14 percent, respectively (Karl *et al.* 2009, p. 111). These trends are expected to increase.

Rates of warming are predicted to more than double in comparison to what the Southeast has experienced since 1975, with the greatest increases projected for summer months. Depending on the emissions scenario used for modeling change, average temperatures are expected to increase by 4.5 ^{o}F to 9 ^{o}F (2.5 ^{o}C to 5 ^{o}C) by the 2080s (Karl *et al.* 2009, pp. 111). While there is considerable variability in rainfall predictions throughout the region, increases in evaporation of moisture from soils and loss of water by plants in response to warmer temperatures are expected to contribute to the effect of these droughts (Karl *et al.* 2009, pp. 112).

Since Magazine Mountain shagreen prefers cool, moist microhabitats, prolonged drought and concomitant warming of temperatures could adversely affect the species. In particular, nesting sites and egg masses may be affected (Caldwell *et al.* 2009, p. 15). However, there are no data to establish that such effects are reasonably certain to occur. In addition, the species possesses biological traits that may provide resilience to this potential threat. For example, Magazine Mountain shagreen tends to retreat into the talus

slopes during dry periods. Egg masses were discovered in 2007 in the leaf litter covering the talus (Caldwell *et al.* 2009, p. 15–16); this tendency for Magazine Mountain shagreen to lay eggs in the leaf litter likely helps protect egg masses from desiccation.

We are not aware of any climate change information specific to the habits or habitat (i.e., talus slopes) of the Magazine Mountain shagreen that would indicate what potential effects climate change and increasing temperatures may have on this species. Therefore, based on the best available information, we do not have any evidence to determine or conclude that climate change is a threat to Magazine Mountain shagreen now or within the foreseeable future.

Summary of Factor E: At this time, we do not have sufficient information to document that climate changes observed to date have had or will have any adverse effect on Magazine Mountain shagreen or its habitat. Vulnerability associated with restricted range is no longer a threat because the entirety of the species' habitat is protected by the USFS and ADPT. Therefore, we find that the other natural or manmade factors considered here do not pose a threat to Magazine Mountain shagreen, nor are they likely to be threats in the foreseeable future. Post delisting monitoring will also afford an opportunity to monitor the status of the species and the impacts of any natural events that may occur for five years.

Conclusion of the 5-Factor Analysis

Under section 3 of the Act, a species is endangered if it is "in danger of extinction in a significant portion of its range" and threatened if it is "likely to become endangered in the foreseeable future throughout all or a significant portion of its range." We have carefully assessed the best scientific and commercial information available regarding the threats faced by Magazine Mountain shagreen in developing this proposed rule. Based on the analysis above and given the reduction in threats, Magazine Mountain shagreen does not currently meet the Act's definition of endangered in that it is not in danger of extinction throughout all of its range, or the definition of threatened in that it is not likely to become endangered in the foreseeable future throughout all of its range.

Significant Portion of the Range Analysis

Having determined that Magazine Mountain shagreen no longer meets the definition of endangered or threatened throughout its range, we must next consider whether there are any significant portions of its range that remain in danger of extinction or likely to become endangered. The Act defines "endangered species" as any species which is "in danger of extinction throughout all or a significant portion of its range," and "threatened species" as any species which is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The definition of "species" is also relevant to this discussion. The Act defines the term "species" as follows: "The term 'species' includes any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature." The phrase "significant portion of its range"

(SPR) is not defined by the statute, and we have never addressed in our regulations: (1) The consequences of a determination that a species is either endangered or likely to become so throughout a significant portion of its range, but not throughout all of its range; or (2) what qualifies a portion of a range as "significant."

Two recent district court decisions have addressed whether the SPR language allows the Service to list or protect less than all members of a defined "species": *Defenders of Wildlife* v. *Salazar*, 729 F. Supp. 2d 1207 (D. Mont. 2010), concerning the Service's delisting of the Northern Rocky Mountain gray wolf (74 FR 15123, April 2, 2009); and *WildEarth Guardians* v. *Salazar*, 2010 U.S. Dist. LEXIS 105253 (D. Ariz. Sept. 30, 2010), concerning the Service's 2008 finding on a petition to list the Gunnison's prairie dog (73 FR 6660, February 5, 2008). The Service had asserted in both of these determinations that it had authority, in effect, to protect only some members of a "species," as defined by the Act (i.e., species, subspecies, or DPS), under the Act. Both courts ruled that the determinations were arbitrary and capricious on the grounds that this approach violated the plain and unambiguous language of the Act. The courts concluded that reading the SPR language to allow protecting only a portion of a species' range is inconsistent with the Act's definition of "species." The courts concluded that once a determination is made that a species (i.e., species, subspecies, or DPS) meets the definition of "endangered species" or "threatened species," it must be placed on the list in its entirety and the Act's protections applied consistently to all members of that species (subject to modification of protections through special rules under sections 4(d) and 10(j) of the Act).

Consistent with that interpretation, and for the purposes of this rule, we interpret the phrase "significant portion of its range" in the Act's definitions of "endangered species" and "threatened species" to provide an independent basis for listing; thus there are two situations (or factual bases) under which a species would qualify for listing a species in its entirety: a species may be endangered or threatened throughout all of its range; or a species may be endangered or threatened in only a significant portion of its range. If a species is in danger of extinction throughout an SPR, it, the species, is an "endangered species." The same analysis applies to "threatened species." Therefore, the consequence of finding that a species is endangered or threatened in only a significant portion of its range is that the entire species will be listed as endangered or threatened, respectively, and the Act's protections will be applied across the species' entire range.

We conclude, for the purposes of this rule, that interpreting the SPR phrase as providing an independent basis for listing or for changes in listing status is the best interpretation of the Act because it is consistent with the purposes and the plain meaning of the key definitions of the Act; it does not conflict with established past agency practice (i.e., prior to the 2007 Solicitor's Opinion), as no consistent, long-term agency practice has been established; and it is consistent with the judicial opinions that have most closely examined this issue. Having concluded that the phrase "significant portion of its range" provides an independent basis for listing and protecting the entire species, we next turn to the meaning of "significant" to determine the threshold for when such an independent basis for listing exists.

Although there are potentially many ways to determine whether a portion of a species' range is "significant," we conclude, for the purposes of this rule, that the significance of the portion of the range should be determined based on its biological contribution to the conservation of the species. For this reason, we describe the threshold for "significant" in terms of an increase in the risk of extinction for the species. We conclude that a biologically based definition of "significant" best conforms to the purposes of the Act, is consistent with judicial interpretations, and best ensures species' conservation. Thus, for the purposes of this proposed rule and finding, a portion of the range of a species is "significant" if its contribution to the viability of the species is so important that, without that portion, the species would be in danger of extinction.

We evaluate biological significance based on the principles of conservation biology using the concepts of redundancy, resiliency, and representation. *Resiliency* describes the characteristics of a species that allow it to recover from periodic disturbance. *Redundancy* (having multiple populations distributed across the landscape) may be needed to provide a margin of safety for the species to withstand catastrophic events. *Representation* (the range of variation found in a species) ensures that the species' adaptive capabilities are conserved. Redundancy, resiliency, and representation are not independent of each other, and some characteristic of a species or area may contribute to all three. For example, distribution across a wide variety of habitats is an indicator of representation, but it may also indicate a broad geographic distribution contributing to redundancy (decreasing the chance that any one event affects the entire

species), and the likelihood that some habitat types are less susceptible to certain threats, contributing to resiliency (the ability of the species to recover from disturbance). None of these concepts is intended to be mutually exclusive, and a portion of a species' range may be determined to be "significant" due to its contributions under any one of these concepts.

For the purposes of this rule, we determine if a portion's biological contribution is so important that the portion qualifies as "significant" by asking whether, *without that portion*, the representation, redundancy, or resiliency of the species would be so impaired that the species would have an increased vulnerability to threats to the point that the overall species would be in danger of extinction (i.e., would be "endangered"). Conversely, we would not consider the portion of the range at issue to be "significant" if there is sufficient resiliency, redundancy, and representation elsewhere in the species' range that the species would not be in danger of extinction throughout its range if the population in that portion of the range in question became extirpated (extinct locally).

We recognize that this definition of "significant" establishes a threshold that is relatively high. On the one hand, given that the consequences of finding a species to be endangered or threatened in an SPR would be listing the species throughout its entire range, it is important to use a threshold for "significant" that is robust. It would not be meaningful or appropriate to establish a very low threshold whereby a portion of the range can be considered "significant" even if only a negligible increase in extinction risk would result from its loss. Because nearly any portion of a species' range can be said to

contribute some increment to a species' viability, use of such a low threshold would require us to impose restrictions and expend conservation resources disproportionately to conservation benefit: listing would be rangewide, even if only a portion of the range of minor conservation importance to the species is imperiled. On the other hand, it would be inappropriate to establish a threshold for "significant" that is too high. This would be the case if the standard were, for example, that a portion of the range can be considered "significant" only if threats in that portion result in the entire species' being currently endangered or threatened. Such a high bar would not give the SPR phrase independent meaning, as the Ninth Circuit held in *Defenders of Wildlife* v. *Norton*, 258 F.3d 1136 (9th Cir. 2001).

The definition of "significant" used in this rule carefully balances these concerns. By setting a relatively high threshold, we minimize the degree to which restrictions will be imposed or resources expended that do not contribute substantially to species conservation. But we have not set the threshold so high that the phrase "in a significant portion of its range" loses independent meaning. Specifically, we have not set the threshold as high as it was under the interpretation presented by the Service in the *Defenders* litigation. Under that interpretation, the portion of the range would have to be so important that current imperilment there would mean that the species would be *currently* imperiled everywhere. Under the definition of "significant" used in this finding, the portion of the range need not rise to such an exceptionally high level of biological significance. (We recognize that if the species is imperiled in a portion that rises to that level of biological significance, then we should conclude that the species is in

fact imperiled throughout all of its range, and that we would not need to rely on the SPR language for such a rule making.) Rather, under this interpretation we ask whether the species would be endangered everywhere without that portion, *i.e.*, if that portion were completely extirpated. In other words, the portion of the range need not be so important that even being in danger of extinction in that portion would be sufficient to cause the remainder of the range to be endangered; rather, the *complete extirpation* (in a hypothetical future) of the species in that portion would be required to cause the remainder of the range to be endangered.

The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that have no reasonable potential to be significant *and* threatened or endangered. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be "significant," and (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not "significant," we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is "significant." In practice, a key part of the portion status analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to

warrant further consideration. Moreover, if any concentration of threats applies only to portions of the species' range that clearly would not meet the biologically based definition of "significant", such portions will not warrant further consideration.

Applying the process described above in considering delisting this snail, we evaluated the range of Magazine Mountain shagreen to determine if any areas could be considered a significant portion of its range. As discussed above, a portion of a species' range is significant if it is part of the current range of the species and is important to the conservation of the species because it contributes meaningfully to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the species. There is no significant variability in the habitats across the range occupied by Magazine Mountain shagreen, which encompasses approximately 8.75 ha (21.6 ac) at 27 talus habitats on Magazine Mountain's west and north slopes in Logan County, Arkansas. The basic ecological components required for the species to complete its life cycle are present throughout the habitats occupied by Magazine Mountain shagreen. No specific location within the current range of the species provides a unique or biologically significant function that is not found in other portions of the range. Furthermore, the threats discussed during the five-factor analysis above are uniform throughout the range of the species.

In conclusion, , we have determined that none of the existing or potential threats, either alone or in combination with others, are likely to cause Magazine Mountain

shagreen to become endangered or threatened now or within the foreseeable future throughout a significant portion of its range.

On the basis of this evaluation, we believe Magazine Mountain shagreen no longer requires the protection of the Act, and we propose to remove Magazine Mountain shagreen from the Federal List of Endangered and Threatened Wildlife (50 CFR 17.11(h)).

Effects of This Proposed Rule

This rule, if finalized, would revise 50 CFR 17.11(h) to remove Magazine Mountain shagreen from the List of Endangered and Threatened Wildlife. Because no critical habitat was ever designated for this species, this rule would not affect 50 CFR 17.95.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions under section 9(a)(1) of the Act make it illegal for any person subject to the jurisdiction of the United States to import or export; transport in interstate or foreign commerce in the course of a commercial activity; sell or offer for sale in interstate or foreign commerce; or take, possess, sell, deliver, carry, transport, or ship Magazine Mountain shagreen. Section 7 of the Act requires that Federal agencies consult with us to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the species'

continued existence. If this proposed rule is finalized, it would revise 50 CFR 17.11(h) to remove (delist) Magazine Mountain shagreen from the Federal List of Endangered and Threatened Wildlife, and these prohibitions would no longer apply.

Post-Delisting Monitoring

Section 4(g)(1) of the Act requires us to monitor for at least 5 years species that are delisted due to recovery. Post-delisting monitoring refers to activities undertaken to verify that a species delisted due to recovery remains secure from the risk of extinction after the protections of the Act no longer apply. The primary goal of post-delisting monitoring is to monitor the species so that its status does not deteriorate, and if a decline is detected, to take measures to halt the decline so that proposing it as endangered or threatened is not again needed. If, at any time during the monitoring period, data indicate that protective status under the Act should be reinstated, we may initiate listing procedures, including, if appropriate, emergency listing.

Section 4(g) of the Act explicitly requires cooperation with the States in development and implementation of post-delisting monitoring programs, but we remain responsible for compliance with section 4(g) of the Act and, therefore, must remain actively engaged in all phases of post-delisting monitoring. We also seek active participation of other entities that are expected to assume responsibilities for the species' conservation after delisting. In June 2010, USFS, AGFC, and ADPT agreed to be cooperators in the post-delisting monitoring of Magazine Mountain shagreen.

We have prepared a draft Post-Delisting Monitoring Plan for Magazine Mountain Shagreen (*Inflectarius magazinensis*) (Plan) (Service 2011). The draft plan:

(1) Summarizes the species' status at the time of delisting;

(2) Defines thresholds or triggers for potential monitoring outcomes and conclusions;

(3) Lays out frequency and duration of monitoring;

(4) Articulates monitoring methods, including sampling considerations;

(5) Outlines data compilation and reporting procedures and responsibilities;

(6) Indicates localities selected for post-delisting monitoring; and

(7) Proposes a post-delisting monitoring implementation schedule, including timing and responsible parties.

Concurrent with this proposed delisting rule, we announce the draft plan's availability for public review. The draft plan can be viewed in its entirety at: *http://www.fws.gov/arkansas-es* or on the Federal eRulemaking Portal at

http://www.regulations.gov. Copies also can be obtained from the U.S. Fish and Wildlife Service, Arkansas Ecological Services Field Office, Conway, Arkansas (see **FOR FURTHER INFORMATION CONTACT** section). We seek information, data, and comments from the public regarding Magazine Mountain shagreen and the post-delisting monitoring strategy. We are also seeking peer review of this draft plan concurrently with the proposed rule's comment period. We anticipate finalizing this plan, considering all public and peer review comments, prior to making a final determination on the proposed delisting rule.

Peer Review

In accordance with our policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), and the OMB's Final Information Quality Bulletin for Peer Review, dated December 16, 2004, we will solicit the expert opinions of at least three appropriate and independent specialists regarding the science in this proposed rule and the draft post-delisting monitoring plan. The purpose of such review is to ensure that we base our decisions on scientifically sound data, assumptions, and analyses. We will send peer reviewers copies of this proposed rule and the draft post-delisting monitoring plan immediately following publication in the **Federal Register**. We will invite peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed delisting and draft post-delisting monitoring plan. We will summarize the opinions of these reviewers in the final decision documents, and we will consider their input and any additional information we receive as part of our

process of making a final decision on the proposal and the draft post-delisting monitoring plan. Such communication may lead to a final decision that differs from this proposal.

Required Determinations

Paperwork Reduction Act of 1995

OMB regulations at 5 CFR 1320, which implement provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq*.), require that Federal agencies obtain approval from OMB before collecting information from the public. The OMB regulations at 5 CFR 1320.3(c) define a collection of information as the obtaining of information by or for an agency by means of identical questions posed to, or identical reporting, recordkeeping, or disclosure requirements imposed on, 10 or more persons. Furthermore, 5 CFR 1320.3(c)(4) specifies that "ten or more persons" refers to the persons to whom a collection of information is addressed by the agency within any 12-month period. For purposes of this definition, employees of the Federal government are not included. This proposed rule and draft post-delisting monitoring plan do not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act. This proposed rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current valid OMB control number.

National Environmental Policy Act

We have determined that we do not need to prepare an environmental assessment or environmental impact statement, as defined in the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq*.), in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994, "Government-to-Government Relations with Native American Tribal Governments" (59 FR 22951), Executive Order 13175, and the Department of Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. We have determined that there are no tribal lands affected by this proposed rule.

References Cited

A complete list of references cited is available on *http://www.regulations.gov* under Docket Number FWS–R4–ES–2012–0002.

Author

The primary author of this document is Chris Davidson, Arkansas Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

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; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

§17.11—[Amended]

2. Amend § 17.11(h) by removing the entry for "*Shagreen, Magazine Mountain*"

under “SNAILS” from the List of Endangered and Threatened Wildlife.

Dated: May 30, 2012

Signed: Daniel M. Ashe

Director, Fish and Wildlife Service

Billing Code 4310–55–P

[FR Doc. 2012-14502 Filed 06/18/2012 at 8:45 am; Publication Date: 06/19/2012]