has determined that this action will not have a substantial direct effect on States or tribal governments, on the relationship between the national government and the States or tribal governments, or on the distribution of power and responsibilities among the various levels of government or between the Federal Government and Indian tribes. Thus, the Agency has determined that Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999) and Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 9, 2000) do not apply to this action. In addition, this action does not impose any enforceable duty or contain any unfunded mandate as described under Title II of the Unfunded Mandates Reform Act (UMRA) (2 U.S.C. 1501 *et seq.*).

This action does not involve any technical standards that would require Agency consideration of voluntary consensus standards pursuant to section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) (15 U.S.C. 272 note).

VII. Congressional Review Act

Pursuant to the Congressional Review Act (5 U.S.C. 801 *et seq.*), EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 180

Environmental protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pests, Reporting and recordkeeping requirements.

Dated: September 30, 2016.

Jack E. Housenger,

Director, Office of Pesticide Programs.

Therefore, 40 CFR chapter I is amended as follows:

PART 180—[AMENDED]

■ 1. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 321(q), 346a and 371.

■ 2. Add § 180.690 to subpart C to read as follows:

§ 180.690 Mandestrobin; tolerances for residues.

(a) *General.* Tolerances are established for residues of mandestrobin, including its metabolites and degradates, in or on the commodities in the table below. Compliance with the tolerance levels specified below is to be determined by measuring only mandestrobin, 2-[(2,5-dimethylphenoxy)methyl]-α-methoxy-N-methylbenzeneacetamide.

Commodity	Parts per million
Berry, low growing, subgroup 13–07G, except cranberry	3.0
Fruit, small vine climbing, except fuzzy kiwifruit, subgroup 13–07F	5.0
Grape, raisin	7.0

(b) *Section 18 emergency exemptions.* [Reserved]

(c) *Tolerances with regional registrations.* [Reserved]

(d) *Indirect or inadvertent tolerances.* [Reserved]

[FR Doc. 2016–24492 Filed 10–7–16; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2014–0054; FXES11130900000 167 FF09E42000]

RIN 1018–BA46

Endangered and Threatened Wildlife and Plants; Removal of Solidago albopilosa (White-haired Goldenrod) From the Federal List of Endangered and Threatened Plants

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule and notice of availability of final post-delisting monitoring plan.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are removing the plant *Solidago albopilosa* (white-haired goldenrod) from the Federal List of Endangered and Threatened Plants. This action is based on a thorough review of the best available scientific and commercial information, which indicates that the threats to this species have been eliminated or reduced to the point that the species no longer meets the definition of an endangered or threatened species under the Endangered Species Act of 1973, as amended. This rule also announces the availability of a final post-delisting monitoring (PDM) plan for white-haired goldenrod.

DATES: This rule is effective on November 10, 2016.

ADDRESSES: This final rule and the PDM plan are available on the Internet at *http://www.regulations.gov* at Docket Number FWS–R4–ES–2014–0054. Comments and materials received, as well as supporting documentation used in the preparation of this rule, will be available for public inspection by appointment, during normal business hours, at the Service's Kentucky Ecological Services Field Office, 330 West Broadway, Suite 265, Frankfort, KY 40601.

FOR FURTHER INFORMATION CONTACT: Virgil Lee Andrews, Jr., Field Supervisor, U.S. Fish and Wildlife Service, Kentucky Ecological Services Field Office, 330 West Broadway, Suite 265, Frankfort, KY 40601; telephone (502) 695–0468. Individuals who are hearing-impaired or speech-impaired may call the Federal Information Relay Service at (800) 877–8339 for TTY assistance 24 hours a day, 7 days a week.

SUPPLEMENTARY INFORMATION:

Executive Summary

This document contains: (1) A final rule to remove *Solidago albopilosa* from the Federal List of Endangered and Threatened Plants at 50 CFR 17.12(h); and (2) a notice of availability of a final PDM plan.

Species addressed—Solidago albopilosa (white-haired goldenrod) is an upright, herbaceous plant with soft, white hairs covering its leaves and stems (Andreasen and Eshbaugh 1973, p. 123). The species produces clusters of small, fragrant, yellow flowers from September to November. *S. albopilosa* is restricted to sandstone rock shelters or rocky ledges of a highly dissected region known as the Red River Gorge in Menifee, Powell, and Wolfe Counties, KY.

The Service listed *Solidago albopilosa* as a threatened species under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*), primarily because of its limited range and threats associated with ground disturbance and trampling caused by unlawful archaeological activities and recreational activities such as camping, hiking, and rock climbing (53 FR 11612, April 7, 1988). Other identified threats included the inadequacy of regulatory mechanisms and minor vegetational changes in the surrounding forest.

When the recovery plan for *S. albopilosa* (white-haired goldenrod) (Recovery Plan) was completed in 1993, the Service knew of 90 extant occurrences of *S. albopilosa* (Service 1993, p. 2), containing an estimated 45,000 stems (each individual plant can

have multiple stems (or branches); stem counts have been the focus of most survey efforts, rather than the number of individual plants, which is often not discernable) (Service 1993, p. 2). The Recovery Plan defined an occurrence as a ''discrete group of plants beneath a single rock shelter or on a single rock ledge.'' All of these locations were situated within the proclamation boundary of the Daniel Boone National Forest (DBNF), and 69 occurrences (77 percent) were in Federal ownership.

Currently, 117 extant occurrences of *S. albopilosa* are known, containing an estimated 174,000 stems. All extant occurrences continue to be located within the proclamation boundary of the DBNF, and 111 occurrences (95 percent) are in Federal ownership and receive management and protection through DBNF's Land and Resource Management Plan (LRMP) (U.S. Forest Service (USFS) 2004, pp. 1.1–1.10). We consider 81 of the extant occurrences (69 percent) to be stable, meaning no change has been detected in their general rank or status over the last 12 years. We consider 46 of the 81 stable occurrences to be adequately protected and self-sustaining as defined by the Recovery Plan, and these occurrences account for approximately 131,000 stems, or about 75 percent of the species' total number.

Over the past 12 years, the Service has worked closely with the Kentucky State Nature Preserves Commission (KSNPC) and DBNF on the management and protection of the species. Management activities have included trail diversion (away from *S. albopilosa* occurrences), installation of protective fencing, and placement of informational signs in rock shelters, along trails, and at trailheads. These activities and other management actions included in the DBNF's LRMP (USFS 2004, pp. 3.5–3.8) have assisted in recovery of the species. Furthermore, a new cooperative management agreement among the Service, DBNF, and KSNPC, which was signed on August 29, 2016, will assist in the long-term protection of the species.

Considering the number of stable, self-sustaining, protected occurrences, the management and protection of habitats provided by DBNF's LRMP and the new cooperative management agreement, and the lack of significant threats to the species or its habitats, we conclude that *Solidago albopilosa* no longer meets the definition of a threatened species under the Act.

Purpose of the Regulatory Action—The purpose of this action is to remove *Solidago albopilosa* from the Federal List of Endangered and Threatened Plants, based on the reduction or removal of threats.

Basis for the Regulatory Action—Under the Act, we may determine that a species is an endangered or threatened species because of one or more of the five factors described in section 4(a)(1) of the Act. We must consider the same factors in removing a species from the List (delisting). Further, we may delist a species if the best scientific and commercial data indicate the species is neither a threatened species nor an endangered species for one or more of the following reasons: (1) the species is extinct; (2) the species has recovered and is no longer threatened or endangered; or (3) the original scientific data used at the time the species was classified were in error. Here, in addition to the application of the five factors, we are delisting the species based on recovery.

We reviewed the best available scientific and commercial information pertaining to the five threat factors for white-haired goldenrod. All 4 peer reviewers and 7 of 10 public commenters supported the proposed action to delist white-haired goldenrod. Our results are summarized as follows:

- We consider *Solidago albopilosa* to be recovered because all substantial threats to this species have been eliminated or reduced and adequate regulatory mechanisms exist.
- The species has met all recovery criteria as outlined in the Recovery Plan (there is a sufficient number of distinct, stable, self-sustaining, and adequately protected occurrences).

Previous Federal Actions

Please refer to the proposed rule to remove *Solidago albopilosa* from the Federal List of Endangered and Threatened Plants (80 FR 52717, September 1, 2015) for a detailed description of previous Federal actions concerning this species. We reopened the comment period for the proposed rule on February 26, 2016 (81 FR 9798), in order to conduct peer review and provide interested parties an additional opportunity to comment on the proposed rule and draft post-delisting monitoring plan. We requested that all interested parties submit written comments by March 28, 2016.

Background

It is our intent to discuss in this final rule only those topics directly relevant to the removal of *Solidago albopilosa* from the Federal List of Endangered and Threatened Plants.

Species Information

The following section contains information updated from that presented in the proposed rule.

Species Description and Life History—*Solidago albopilosa* (Braun 1942) is an upright to slightly arching, herbaceous, perennial plant that attains a height of 30 to 100 centimeters (12 to 39 inches). The species is commonly multi-stemmed because it produces rhizomes (horizontal, usually underground stems) that often root below and produce new stems above. Because of this, the number of plants at a single site is often not discernable from above ground stem distributions. The long, soft, white hairs that cover the leaves and stems are the species' most distinguishing characteristic (Andreasen and Eshbaugh 1973, p. 123). The alternate leaves of *S. albopilosa* are widest at their base and are prominently veined with a dark-green upper surface and a pale underside. They vary in length from 6 to 10 centimeters (2.5 to 4.0 inches), with the larger leaves closer to the base of the stem. Hairs cover both surfaces of the leaves and are most dense along the veins. The stem is cylindrical and densely covered with fine white hairs. Axillary (positioned along the main axis of the plant) clusters of small, fragrant, yellow flowers begin blooming in late August. The flower heads are composed of three to five ray florets (small flowers in the marginal part of the flower head) and more than 15 disk florets (small flowers in the central part of the flower head). The ray florets are about 6 mm long (0.24 inch), and the disk flowers are about 3 mm long (0.12 inch). The pale-brown, pubescent, oblong achenes (dry single-seed fruits) appear in October (Braun 1942, pp. 1–4; Andreasen and Eshbaugh 1973, p. 123; Service 1993, p. 1).

Solidago albopilosa flowers from September through November and sets fruit in mid-October through December. The flowers are visited by bees (Families Apidae and Halictidae), moths (Order Lepidoptera), and syrphid flies (Family Syrphidae), which are likely attracted by the fragrant, yellow flowers (Braun 1942, pp. 1–4; Service 1993, p. 6). Viability of the species' pollen is reported to be high (Andreason and Eshbaugh 1973, pp. 129–130). Seeds are most likely dispersed by wind, but germination rates and the extent of vegetative reproduction in the wild are unknown (Service 1993, p. 6). Seedlings are observed frequently in the wild, but the percentage of seeds that germinate in the wild is unknown (Taylor 2016, U.S. Forest Service, pers. comm.). Germination of seed collected from the

wild has high viability in the laboratory (near 100 percent), and plants grow readily from seed (Taylor 2016, pers. comm.).

Braun (1942, pp. 1–4) described *S. albopilosa* based on specimens discovered in the summer of 1940 in the Red River Gorge area of Menifee County, KY. *S. albopilosa* is in the family Asteraceae, and there are no synonyms for the species. Andreasen and Eshbaugh (1973, pp. 126–128) studied variation among four separate occurrences (populations) of *S. albopilosa* in Menifee and Powell Counties. Their population analysis of characteristics such as plant height, leaf length and width, stem pubescence, and number of ray flowers per head showed that some morphological characteristics (*e.g.,* plant height, leaf shape and size, stem pubescence) can vary widely between populations.

Solidago albopilosa can be distinguished from its closest relative, *S. flexicaulis* (broad-leaf goldenrod), by its shorter height, smaller and thinner leaves, and generally downy (hairy) appearance (the leaves of S. *flexicaulis* have a slick, smooth appearance) (Medley 1980, p. 6). The two species also differ in habitat preference. *S. albopilosa* is restricted to sandstone rock shelters or ledges, while *S. flexicaulis* is a woodland species that occurs on the forest floor. Esselman and Crawford (1997, pp. 245–256) used molecular and morphological analyses to examine the relationship between *S. albopilosa* and *S. flexicaulis.* They concluded that *S. albopilosa* is most closely related to *S. flexicaulis;* however, there was no evidence that either *S. flexicaulis* or *S. caesia* (wreath or blue-stemmed goldenrod) is a parent or has a recent close relationship with *S. albopilosa* as was previously speculated by Braun (1942, pp. 1–4). Esselman and Crawford (1997, pp. 245–256) also examined genetic diversity within the species *S. albopilosa* (using Random Amplified Polymorphic DNA and isozyme markers) and reported genetic variation both within and between populations (genetic diversity is widely spread among populations, and populations are not very genetically homogenous). The highest level of genetic diversity was observed among (across) versus within populations. Consequently, Esselman and Crawford (1997, pp. 245–256) recommended that conservation efforts include the maintenance of as many populations as possible to capture the full genetic diversity of the species.

Solidago albopilosa is restricted to outcroppings of Pottsville sandstone in a rugged, highly dissected area known as the Red River Gorge in Menifee, Powell, and Wolfe Counties, KY (Service 1993, p. 2; White and Drozda 2006, p. 124). The Red River Gorge is well known for its scenic beauty and outdoor recreational opportunities, and much of the area is located within the DBNF, an approximate 2,860-km^2 (706,000-acre) area in eastern Kentucky that is managed by the U.S. Forest Service (White and Drozda 2006, p. 124). The Red River Gorge lies within the Northern Forested Plateau Escarpment of the Western Allegheny Plateau ecoregion (Woods et al. 2002, p. 1). The hills and ridges of this region are characterized as rugged and highly dissected, with erosion-resistant, Pennsylvanian quartzose sandstone (contains 90 percent quartz) capping the ridges and exposed layers of Mississippian limestone, shale, and siltstone on lower slopes and in the valleys.

Solidago albopilosa occurs on the floors of sandstone rock shelters (natural, shallow, cave-like formations) and on sheltered cliffs (cliffs with overhanging ledges) at elevations between 243 and 396 m (800 and 1,300 ft) (Andreasen and Eshbaugh 1973; Service 1993, p. 5). The species may also be found on ledges or vertical walls of these habitats, but, regardless of the specific location, *S. albopilosa* is restricted to areas of partial shade behind the dripline (53 FR 11612; April 7, 1988) and typically does not grow in the deepest part of rock shelters (Harker et al. 1981, p. 4). Campbell et al. (1989, p. 40) noted that this plant species is known from all possible moisture regimes and aspects in these habitats, but plants on northern exposures appeared to be smaller than average. Seven of nine occurrences examined by Nieves and Day (2014, pp. 8–9) were located in easterly or northerly facing shelters, which receive minimal direct sunlight. Nieves and Day examined only a small percentage of the species' 117 known occurrences (8 percent), so further study is required to determine the importance of the solar aspect on the species' biology and distribution. Ten rock shelter habitats examined by Nieves and Day (2014, p. 7) were significantly cooler and more humid than the surrounding environment (areas outside and above the rock shelter), but the species' requirements with respect to air temperature and relative humidity are unknown.

Typical herbaceous associates of this plant include roundleaf catchfly (*Silene rotundifolia*) and alumroot (*Heuchera parviflora*) and less commonly white baneberry (*Actaea pacypoda*), maidenhair fern (*Adiantum pedatum*), fourleaf yam (*Dioscorea quaternata*), intermediate woodfern (*Dryopteris intermedia*), Indian cucumber-root (*Medeola virginiana*), Japanese stilt grass (*Microstegium vimineum;* invasive, non-native), Christmas fern (*Polystichum acrostichoides*), rhododendron (*Rhododendron maximum*), and little mountain meadow-rue (*Thalicturm mirabile*) (Braun 1942, pp. 1–4; Andreason and Eshbaugh 1973, p. 128; Kral 1983, p. 1253; Campbell et al. 1989, p. 40; White and Drozda 2006, p. 124). Associated woody species of the mixed mesophytic forest adjacent to *S. albopilosa* occurrences include red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), American holly (*Ilex opaca*), mountain laurel (*Kalmia latifolia*), tulip poplar (*Liriodendron tulipifera*), bigleaf magnolia (*Magnolia macrophylla*), umbrella magnolia (*M. tripetala*), black gum (*Nyssa sylvatica*), oaks (*Quercus* spp.), basswood (*Tilia americana*), and eastern hemlock (*Tsuga canadensis)* (Andreason and Eshbaugh 1973, p. 128; Kral 1983, p. 1253; Campbell et al. 1989, p. 40).

When the Recovery Plan was completed in 1993, 90 extant occurrences were known (Service 1993, p. 2), containing an estimated 45,000 stems (Service 1993, p. 2). All of these locations were situated within the proclamation boundary of the DBNF, and 69 occurrences (approximately 76 percent) were located on Federal lands. The remaining occurrences (21) were located on private property. Rather than try to determine what constituted a population, the Recovery Plan (Service 1993, p. 1) used ''occurrence,'' defining it as a ''discrete group of plants beneath a single rock shelter or on a single rock ledge.'' In making this definition, the Service (1993, p. 6) explained that pollinators (bees and syrphid flies) likely carried pollen between rock shelters and may even move between adjacent ravines. If there were sufficient gene flow between occurrences via pollinators, clusters of nearby rock shelters or adjacent ravines could comprise a population. However, without additional research, it was impossible to determine the species' actual population boundaries.

Subsequently, the KSNPC completed surveys in 1996, 1999, 2002, 2004, and 2005 (White and Drozda 2006, pp. 124–128; KSNPC 2010, p. 4), and these surveys documented an increase in the number of *S. albopilosa* occurrences from 90 to 141. Despite the increased number of occurrences, the total range of *S. albopilosa* did not increase significantly as it was still restricted to

the same general area within the Red River Gorge. KSNPC (2010, pp. 4–8) completed the first range-wide survey during the 2008 and 2009 field seasons. During this 2-year period, KSNPC ranked each occurrence based on population size and viability, habitat condition, and degree of threat. KSNPC also evaluated the stability of each occurrence by comparing their 2008–2009 survey data with data collected in previous years. The following specifications were used to rank the occurrences (KSNPC 2010, p. 21):

A (excellent estimated viability): 2,500 or more stems in habitat with low degree of recreational impact or a minimum of 4,000 stems where the degree of recreational impact is medium or high.

B (good estimated viability): 1,000 to 2,499 stems and some areas of habitat with a low degree of recreational impact or higher numbers of stems (2,500 to 4,000) at sites where the degree of recreational impact is medium or high.

C (fair estimated viability): 300 to 999 stems where recreational impacts are low or higher numbers of stems (1,000 to 2,000) at sites affected by a medium or high degree of recreational impact; may also include sites with little opportunity for habitat recovery or population expansion.

D (poor estimated viability): fewer than 300 stems in any habitat.

H (historical): taxon or natural community has not been reliably reported in Kentucky since 1990 but is not considered extinct or extirpated.

X (extirpated): A taxon for which habitat loss has been pervasive and/or concerted efforts by knowledgeable biologists to collect or observe specimens within appropriate habitats have failed.

F (failed to find): occurrence not located in current survey; original mapping may be in wrong location.

During their 2-year range wide survey, KSNPC (2010, p. 6) documented a total of 116 extant occurrences, producing ranks with the following categorical results: A-rank (11 occurrences), B (26), C (25), and D (54) (see table 1). The remaining 25 occurrences were considered to be historical, extirpated, or could not be relocated (failed to find). The goldenrod's range has been searched extensively by KSNPC and of the 116 extant occurrences, only 6 were located on private land, with the remainder located on the DBNF. There is limited private ownership in the area where this plant occurs and the species' habitat as described above has only been located in a few privately-owned occurrences and nowhere else that has been surveyed. For all extant occurrences, 79 (68 percent) were considered to be stable, including ranks of A (10 occurrences), B (21), C (18), and D (30). Stability was estimated through comparisons of historical and more recent survey data. Occurrences were considered ''stable'' if no change was detected in their general rank/status over the course of monitoring, stem numbers increased over the course of monitoring, and/or slight decreases in stem numbers could be attributed to natural climatic variation. Ranks were based on population size and perceived viability, habitat condition, and degree of threat. For all stable occurrences, KSNPC reported an average monitoring period of 10.2 years and an average of 3.6 monitoring events for each occurrence. Also, the level or degree of recreational impact is based on KSNPC's assessment of recreational use and threats from that use at each occurrence. For those sites where the degree of impact was higher, more stems were required to achieve a higher rank (*i.e.,* fair to excellent viability). For example, 4 of the 11 ''A'' ranked occurrences had a medium/high degree of impact (equals a minimum of 4,000 stems). The rest of the 11 ''A'' ranked occurrences had a low degree of impact (equals 2,500 stems or more). All of the ''A'' ranked occurrences have proven stable (for over 11 years) with a high number of stems. Due to future conservation actions with DBNF, we expect the 4 ''A'' ranked occurrences with medium to high recreational impacts to remain stable (numbers of stems will remain constant or increase) and the degree of recreational impact may decrease.

TABLE 1—SUMMARY OF *Solidago albopilosa* RANKS AND STATUS BASED ON RANGE-WIDE SURVEYS COMPLETED BY THE KENTUCKY STATE NATURE PRESERVES COMMISSION IN 2008 AND 2009

[KSNPC 2010]

Status	Ranks of extant occurrences				
	A	B	C	D	Total
Stable	10	21	18	30	79
Declining	0	5	4	22	31
Unknown	1	0	3	2	6
Total	11	26	25	54	116

For the remaining extant occurrences, 31 were considered to be declining and 6 were of unknown status. For the declining occurrences, ranks included B (5 occurrences), C (4), and D (22). For the unknown occurrences, ranks included A (1 occurrence), C (3), and D (2). Occurrences were considered to be declining if a negative change was detected in the general rank/status over the course of monitoring and/or there was a greater than 30 percent decline in stem count. Unknown status meant surveys of that occurrence were not performed more than once or prior surveys could not be compared to more recent surveys due to discrepancies in survey methodology.

KSNPC and the Service completed additional surveys from June to October 2013 at 30 widely separated occurrences, resulting in the discovery of one new occurrence and revised status information for two unknown occurrences (USFWS 2014, entire). Combining these results with occurrence totals reported by KSNPC (2010, 24 pp.), there are now 81 stable occurrences with the following categorical results: A (11 occurrences), B (22), C (18), and D (30) (table 2). The average monitoring period increased from 10.2 to 11.1 years, with an average of 3.7 monitoring events for each occurrence. The total number of stems now stands at 174,357, compared to 45,000 when the Recovery Plan was completed.

TABLE 2—SUMMARY OF CURRENT *Solidago albopilosa* RANKS AND STATUS (KSNPC 2010, 2014) SHOWING AN INCREASE IN A- AND B-RANKED OCCURRENCES

Status	Ranks of extant occurrences				
	A	B	C	D	Total
Stable	11	22	18	30	81
Declining	0	5	4	23	32
Unknown	0	0	2	2	4
Total	11	27	24	55	117

In summary, considering recent survey efforts by KSNPC and the Service (KSNPC 2010, entire; USFWS 2014, entire), the following conditions exist for white-haired goldenrod:

(1) A total of 117 extant occurrences are known. Of these, 81 occurrences are considered to be stable with the following categorical results: A (11 occurrences), B (22), C (18), and D (30). As of 2015, the average monitoring period per occurrence was 11.1 years, with an average of 3.7 monitoring events for each occurrence.

(2) Fifty-one of the 81 stable occurrences (all A-, B-, and C-ranked occurrences) are considered to be self-sustaining as defined by the Recovery Plan. These occurrences are considered to be self-sustaining because there is evidence of successful reproduction and the number of stems is stable or increasing.

(3) Forty-six of the 51 stable, self-sustaining occurrences are adequately protected as defined by the recovery plan (species is legally protected, has received adequate physical protection, and is assured of all required management).

(4) The total number of stems now stands at approximately 174,000, and the 46 secure, self-sustaining occurrences contain approximately 131,000 stems, or about 75 percent of the species' total number.

Recovery and Recovery Plan Implementation

Background—Section 4(f) of the Act (16 U.S.C. 1531 *et seq.*) 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. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the list. However, revisions to the list (adding, removing, or reclassifying a species) must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is endangered or threatened (or not) because of one or more of five threat factors. Section 4(b) of the Act requires that the determination be made ''solely on the basis of the best scientific and commercial data available.'' Therefore, recovery criteria should help indicate when we would anticipate that an analysis of the five threat factors under section 4(a)(1) would result in a determination that the species is no longer an endangered species or threatened species because of any of the five statutory factors (see Summary of Factors Affecting the Species section). However, while recovery plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable criteria against which to measure progress towards recovery, they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of or remove a species from the Federal List of Endangered and Threatened Plants at 50 CFR 17.12(h) is ultimately based on an analysis of the best scientific and commercial data available to determine whether a species is no longer an endangered or threatened species, regardless of whether that information differs from the recovery plan.

Recovery plans may be revised to address continuing or new threats to the species, as new, substantive information becomes available. The recovery plan identifies site-specific management actions that will achieve recovery of the species, measurable criteria that set a trigger for review of the species' status, and methods for monitoring recovery progress. Recovery plans are intended to establish goals for long-term conservation of listed species and define criteria that are designed to indicate when the substantial 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.

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 discovered that was not known at the time the recovery plan was finalized. The new information may change the extent to which 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.

Recovery Planning and Implementation—The Recovery Plan was approved by the Service on September 28, 1993 (Service 1993, 40 pp.). The Recovery Plan includes recovery criteria intended to indicate when threats to the species have been adequately addressed, and prescribes actions necessary to achieve those criteria. We first discuss progress on completing the primary recovery actions, then discuss recovery criteria. The Recovery Plan identifies five primary actions necessary for recovering *S. albopilosa:*

(1) Protect existing occurrences;

(2) Continue inventories;

(3) Conduct studies on life history and ecological requirements;

(4) Maintain plants and seeds *ex situ;* and

(5) Provide the public with information.

Three of five recovery actions (1, 2, and 5) have been accomplished. Completion of the remaining actions (3

and 4) is discussed in greater detail below.

The Service entered into a cooperative agreement with KSNPC in 1986, under section 6 of the Act, for the conservation of endangered and threatened plant species. This agreement has provided a mechanism for KSNPC to acquire Federal funds that have supported much of the recovery work described here. The Commonwealth of Kentucky and other partners have also provided matching funds under this agreement that have assisted in the species' recovery.

Recovery Action (1): Protect Existing Occurrences

The Recovery Plan states that an occurrence will be ''adequately protected'' when it is legally protected, has received adequate physical protection, and is assured of all required management (USFWS 1993, 40 pp.). Based on these criteria, we consider a total of 46 A-, B-, or C-ranked occurrences on the DBNF to be adequately protected. We base our decision regarding their level of protection on the location of these occurrences (all are in DNBF ownership, and many are in remote locations not visited by the public); trends in occurrence data gathered by KSNPC, DBNF, and the Service; observations about threats reported by KSNPC (2010, pp. 5–18); conservation actions described in DBNF's Land and Resource Management Plan (LRMP); and information in our files concerning specific DBNF conservation actions, such as trail closure, placement of signs, and fencing. We have chosen to exclude five, stable, self-sustaining occurrences from the list of ''protected'' occurrences because they are in private ownership, and no conservation agreement or plan is in place to ensure their long-term protection.

The species' primary threat has been identified as ground disturbance and trampling associated with recreational activities (*i.e.,* camping, hiking, and rock-climbing) within the Red River Gorge. To address these threats, the DBNF began to redirect trails and install fencing (chicken wire) around selected *S. albopilosa* rock shelters in February 2000. The DBNF focused on these occurrences because they were near DBNF user-defined trails and were suffering obvious recreational impacts—trampling and ground disturbance associated with camping, rock climbing, and hiking. The DBNF also placed informational signs at these shelters and at trailheads, alerting visitors to the presence of the species and warning them against potential damage to plants.

Signs or fencing were placed and have been maintained at a total of 21 occurrences identified as being impacted in the past, and DBNF personnel continue to visit these sites annually, checking the condition of signs and fencing and making repairs as needed. To guard against future impacts, the DBNF and KSNPC have proposed the addition of new or expanded fencing at five occurrences. As stated below in this recovery section, this new and expanded fencing is included as a conservation action in the Service's signed cooperative management agreement with DBNF and KSNPC (USFWS August 2016).

Monitoring results show that implementation of the LRMP, including specific conservation actions described above (fencing and sign placement), have had a positive effect on the species (KSNPC 2010, 24 pp.). Specifically, it has been demonstrated that disturbance from trampling, camping, and rock climbing is low at remote occurrences, and impacts have been reduced at more visited sites. The number of stems has remained stable or increased at 20 of 21 occurrences (95 percent) where fencing or informational signs have been added. For all extant occurrences on the DBNF, 75 (68 percent) of 111 extant occurrences are considered stable to increasing, and we consider 46 occurrences to be self-sustaining (A-, B-, or C-ranked occurrences that are stable and reproducing). Based on all these factors, we consider this recovery action to be complete.

Recovery Action (2): Continue Inventories

There were 90 extant occurrences of *S. albopilosa* when the Recovery Plan was completed (Service 1993, p. 2). In subsequent years, KSNPC completed surveys within the Red River Gorge in 1996, 1999, 2002, 2004, and 2005 (White and Drozda 2006, pp. 124–128; KSNPC 2010, p. 2), raising the number of documented *S. albopilosa* occurrences from 90 to 141. Surveys in other areas of Kentucky and adjacent States with suitable habitat (*e.g.,* sandstone rock shelters) did not show evidence of additional occurrences of the species (Campbell et al. 1989, pp. 29–43; Palmer-Ball et al. 1988, pp. 19–25; Walck et al. 1996, pp. 339–341; Norris and Harmon 2000, pp. 2–3). The first range-wide survey in the Red River Gorge was completed during the field seasons of 2008 and 2009 (KSNPC 2010, pp. 4–8), and KSNPC and the Service completed follow-up surveys at 30 extant occurrences in 2013 (See the Species Information section above for detail on surveys). During these efforts, KSNPC and the Service documented a total of 117 extant occurrences, and, of these, we consider the A-, B-, and C-ranked occurrences (total of 46) to be secure and self-sustaining. Because systematic searches for new occurrences have been conducted since the completion of the Recovery Plan and led to the discovery of previously unknown occurrences, we consider this recovery action to be completed.

Recovery Action (3): Conduct Studies on Life History and Ecological Requirements

This recovery action is incomplete (not all subactivities have been addressed completely) but significant progress has been made. Since publication of the Recovery Plan (Service 1993), studies of the species' life history and ecological requirements have included Esselman (1995, pp. 5–10), Esselman and Crawford (1997, pp. 246–251), White and Drozda (2006, p. 125), KSNPC (2010, p. 5), and Nieves and Day (2014, pp. 1–12). Esselman (1995, pp. 5–10) and Esselman and Crawford (1997, pp. 246–251) studied the ancestry of *S. albopilosa,* examined gene flow and genetic diversity within and between populations, and investigated life-history traits (*i.e.,* seed set, importance of pollinators, self-incompatibility (the inability of a plant to produce seeds when its flowers are pollinated from its own flowers or from flowers of plants that are genetically the same)). The ancestry of *S. albopilosa* was unclear, but it had the most morphological and genetic similarity with *S. flexicaulis.* Despite this, the two species were reported as genetically different, and there was no evidence of recent gene flow. Esselman (1995, pp. 16–23) and Esselman and Crawford (1997, pp. 251–253) observed the highest levels of genetic diversity between populations rather than within populations. The levels of seed production appeared to be about equal to that of other goldenrods, but the amount of seed set varied between populations and appeared to increase with increasing occurrence size. Pollination experiments indicated that pollinators are necessary for seed set, and the species is self-incompatible.

During field surveys between 1996 and 2009, KSNPC collected occurrence information throughout the species' range, recording such information as stem count, patch size, percent vegetative versus sexual reproduction, recreational disturbance (ranked from low to high), other perceived threats, and general habitat condition (White and Drozda 2006, p. 125; KSNPC 2010, p. 5). In its 2-year range-wide study,

KSNPC (2010, p. 5) used a two-page plant survey form to record more detailed biological information at each occurrence: Population structure (percent stems exhibiting vegetative versus reproductive growth), occurrence size (square meters [m^2]), plant height, number of stems, number of rosettes, population density, plant vigor, and an evaluation of threats (*e.g.,* trampling, camping, invasive plants, herbivory). KSNPC (2010, p. 5) also photographed each occurrence and made sketches that showed individual patch locations within each occurrence or rock shelter.

Nieves and Day (2014, pp. 1–12) conducted a preliminary assessment of the microclimatic and pedological (soil) conditions of 10 rock shelters inhabited by the species. They documented significant differences between the inside of rock shelters and the surrounding environment with respect to temperature and relative humidity (habitats inside rock shelters were wetter and more humid) but no significant differences with respect to soil characteristics (macronutrients and acidity/alkalinity (pH)). Most of the rock shelters they investigated were easterly or northerly facing, but their small sample size prevents any significant conclusions with respect to the importance of sunlight and solar radiation.

Under recovery action 3.0, two of seven subactivities remain to be completed—the use of quantitative, permanent plots (3.1) and determination of specific habitat requirements (3.3). Permanent plots have not been established, but the species' known occurrences have been visited and evaluated repeatedly (average of 3.6 times) since completion of the recovery plan. These visits have allowed us to evaluate the species' status and track the number of stems and flowers. The purpose of recovery subactivity 3.1 was to evaluate demography, and we believe the visits and work done in cooperation with KSNPC provided enough population data on this plant for us to propose delisting it without establishing permanent plots. The species' specific habitat requirements (*e.g.,* light, moisture, soils) are not well understood, but preliminary investigations into the microclimate and soil conditions of rock shelters were completed by Nieves and Day (2014, pp. 1–12), and additional research is planned (Nieves and Day 2014, pp. 11–12). In partnership with DBNF and KSNPC, we have done extensive work together to reduce threats such as disturbance. The purpose of recovery subactivity 3.3 was to learn about habitat requirements of this plant for the purposes of determining if reintroduction or artificial propagation may be necessary to help recover this plant. *Solidago albopilosa* occurrences have grown in number and size as recovery implementation actions have been implemented and threats have been removed or reduced. These successful actions have negated the necessity of having to reintroduce or augment plants. We will continue to learn more about the species' habitat requirements as we work with DBNF and KSNPC through post-delisting monitoring. In the course of this work, if a new threat of any kind presents itself, we have identified in the PDM plan how we will evaluate it.

The majority of recovery subactivities (3.2, 3.4–3.7) have been addressed; information has been gained regarding the species' life history and ecological requirements; and the species' status has improved since publication of the recovery plan. We were able to obtain the intended information identified in recovery subactivity 3.3 (analyze habitat requirements) through implementation of other actions. Although the need to conduct subactivity 3.3 has been removed with positive progress in this plant's recovery program, we intend throughout post-delisting monitoring to continue to work closely with researchers as they learn more about this species and its habitat.

Recovery Action (4): Maintain Plants and Seeds Ex Situ

Seeds and plants of *S. albopilosa* have not been maintained ex situ in any museum, botanical garden, or other seed storage facility; however, an August 29, 2016, conservation agreement between the Service, the Kentucky Natural Lands Trust, and the Missouri Botanical Garden (MOBOT) will facilitate a seed-banking effort for *S. albopilosa.* Through the agreement, MOBOT has secured funding that will allow it to collect, curate, and maintain genetically diverse and representative seed-bank accessions to safeguard against future population declines. These efforts will take place as part of post-delisting monitoring activities and will involve collection of seed from across the species' range with deposition of the material at the MOBOT. Seed collection will occur in the fall of 2016. Because of the conservation agreement described above, which outlines future seed-banking activities by MOBOT, we consider this recovery action to be on a path toward completion and sufficient to contribute towards delisting.

Recovery Action (5): Provide the Public With Information

The KSNPC and DBNF have prepared several species factsheets and signs that have been posted at gas stations, restaurants, kiosks, and trailheads throughout the Red River Gorge. These signs are intended to educate Red River Gorge visitors about the species and its threats. Signs about *S. albopilosa* have also been posted in five archaeologically sensitive rock shelters to aid in the protection of historical artifacts while promoting the conservation of *S. albopilosa.* DBNF also displays photographs and provides information on *S. albopilosa* at its Gladie Cultural-Environmental Learning Center. KSNPC makes available on its Web site (*http://naturepreserves.ky.gov*) an *S. albopilosa* factsheet and several threatened and endangered species lists that include information on *S. albopilosa.* In June 2009, the Kentucky Department of Fish and Wildlife Resources published 2,000 copies of a revised threatened and endangered species booklet (second edition), which contained a species account for *S. albopilosa.* Because of the numerous public information and education projects listed above, we consider this recovery action completed.

Recovery Criteria

The Recovery Plan states that *S. albopilosa* will be considered for delisting when 40 geographically distinct, self-sustaining occurrences are adequately protected and have been maintained for 10 years. An occurrence is considered as self-sustaining if there is evidence of successful reproduction and the number of stems is stable or increasing. An occurrence is considered to be adequately protected when it is legally protected, receives adequate physical protection, and is assured of all required management. The Recovery Plan also noted that the requirements for delisting were preliminary and could change as more information about the biology of the species was known. Based on our current understanding of the species' range, biology, and threats, we believe that the delisting criteria continue to be relevant. While the number of occurrences has increased since completion of the Recovery Plan, the species' overall range and the type of threats have not changed dramatically. Furthermore, our current knowledge of the species' biology indicates that multiple, distinct populations should be maintained in order to provide redundancy (protect against stochastic events) and preserve genetic diversity. We believe the recovery goal of 40 stable, self-

sustaining, and protected occurrences is sufficient to address these needs. The species' current number of stable, self-sustaining, and protected occurrences (46) has exceeded this recovery goal (see discussion of Recovery Action 1 above). These occurrences are distributed across the species' range and contain more than 75 percent of the species' total number of stems.

The criteria for delisting *S. albopilosa* have been met, as described below. Additionally, the level of protection currently afforded to the species and its habitat, as well as the current status of threats, are outlined below in the Summary of Factors Affecting the Species section.

Currently, there are 117 extant occurrences. As described above, an occurrence is defined as a ''discrete group of plants beneath a single rock shelter or on a single rock ledge,'' and each occurrence is considered ''geographically distinct'' as described in the recovery criteria. We currently consider 81 (69 percent) of the 117 extant *Solidago albopilosa* occurrences to be stable, meaning no change has been detected (over an average monitoring period of 11.1 years) in their general rank or status. Of these, we consider the A-, B-, and C-ranked occurrences (total of 46) to be adequately protected and self-sustaining as defined by the Recovery Plan. We consider these occurrences to be self-sustaining for the following reasons:

(1) The number of stems at these occurrences has been stable or increasing over an average monitoring period of 11.1 years;

(2) these natural occurrences contain a relatively high number of stems (range of 797–9,200);

(3) the estimated viability of these occurrences ranges from fair to excellent;

(4) the threat level at these occurrences is generally low (average recreational impact of 2.5 or less on a scale of 1 (low impact) to 5 (high)); and

(5) the observed reproduction (flowering stems) at these occurrences has been relatively high, averaging 75–90 percent of stems in nearly all cases (KSNPC 2010, p. 10).

We consider these occurrences to be adequately protected because of their location (all are located on DBNF land); trends in occurrence data gathered by KSNPC, DBNF, and the Service; observations about threats reported by KSNPC (2010, pp. 5–18); conservation actions described in DBNF's LRMP; and information in our files concerning specific DBNF conservation actions, such as trail closure, placement of signs, and fencing. We do not consider the stable, D-ranked occurrences (total of 30) to be self-sustaining, primarily due to their poor estimated viability and the low number of stems (fewer than 300) observed at these sites. However, due to the existence of 46 geographically distinct, self-sustaining occurrences, we conclude that we have met and exceeded the criterion of 40 geographically distinct, self-sustaining occurrences.

While we consider only 46 out of the 117 total extant occurrences to currently be secure (adequately protected) and self-sustaining (approximately 39 percent of the total occurrences), these occurrences contain the majority of the total number of stems of the species. The total number of stems now stands at approximately 174,000, and the 46 secure, self-sustaining occurrences contain approximately 131,000 stems, or about 75 percent of the species' total number. If we consider the five additional self-sustaining occurrences located on private property, the total number of stems increases to 140,500 stems, or about 81 percent of the species' total number. While the remaining 65 occurrences on DBNF are not currently considered self-sustaining, all of these occurrences will continue to receive protection and management under DBNF's LRMP and we expect, based on the past 10 years of monitoring, their status will likely remain stable or continue to improve.

With respect to protection, 111 of 117 extant occurrences (95 percent) occur on the DBNF and receive management and protection through DBNF's LRMP (USFS 2004, pp. 1.1–1.10). As specified in the LRMP, *S. albopilosa* habitats receive protection and management consideration as part of the Cliffline Community Prescription (or management) Area (USFS 2004, pp. 3.5–3.8). The Cliffline Community is defined as the area between 100-feet slope-distance from the top of the cliff and 200-feet slope-distance from the dripline of the cliffline. A cliffline is defined as a naturally occurring, exposed, and nearly vertical rock structure at least 10 feet (3.05 meters (m)) tall and 100 feet (30.05 m) long. All known *S. albopilosa* occurrences occur within habitats fitting this description and, therefore, are included in this Prescription Area. For the Cliffline Community area, conservation goals in the LRMP include: (1) Maintenance of the unique physical and microclimatic conditions in these habitats, (2) the recovery of *S. albopilosa,* and (3) the protection of these habitats against anthropogenic disturbance (USFS 2004, p. 3.6). To meet these goals, the following activities or resource uses are prohibited within the cliffline zone: Mineral, oil, or gas exploration and development (Forest Service Standard 1.C–MIN–1); road construction (1.C–ENG–1); recreational facilities (1.C–REC–1); recreational activities such as rock climbing and rappelling (C–REC–2); camping (1.C–REC–3); and campfires (1.C–REC–4). Other activities such as wildlife management (1.C–WLF) and vegetation management (1.C–VEG) are limited and strictly controlled. This Prescription Area is classified as ''Unsuitable for Timber Production,'' but timber harvests may occur on an unscheduled basis to attain a desired future condition. Harvest of wood products may occur only as an output in pursuing other resource objectives (USFS 2004, pp. 3.5–3.8). DBNF monitors cliffline habitats and protects them as needed through law enforcement activities, construction of fences, trail diversion, and placement of signs.

Since the species was listed, we have worked closely with KSNPC and DBNF on the management and protection of *S. albopilosa.* Management activities have included trail diversion (away from *S. albopilosa* occurrences), installation of protective fencing, and placement of informational signs in rock shelters, along trails, and at trailheads. These activities and other management actions included in the DBNF's LRMP (USFS 2004, pp. 3.5–3.8) have assisted in recovery of the species, as reflected in the large number of stable occurrences (81), self-sustaining occurrences (51 occurrences with ranks of A, B, or C), and the long period (greater than 11 years) during which this trend has been maintained. On August 29, 2016, we finalized a cooperative management agreement among the Service, DBNF, and KSNPC that will provide for the long-term protection of the species. The management agreement outlines a number of conservation actions that will benefit the species:

(1) Maintenance of current fencing;

(2) installation and maintenance of fencing at five new occurrences;

(3) evaluation of trail diversion, rerouting, or closure at 39 occurrences identified by KSNPC (2010, entire);

(4) placement of new informational signs at occurrences with high visitation;

(5) monitoring of extant occurrences;

(6) protection of extant occurrences through DBNF patrols; and

(7) continuation of education and outreach efforts. The cooperative management agreement will remain in place until August 2022.

In summary, most major recovery actions are complete, and significant

progress has been made on the remaining actions (life history/ecological studies and ex situ seed conservation). Completion of these actions has contributed to achieving and exceeding the recovery criteria: 40 geographically distinct, self-sustaining occurrences are adequately protected and have been maintained for over 10 years. The 46 secure, self-sustaining occurrences contain 75 percent of the species' total number of stems, and thus represent 75 percent of the species' total population. These secure, self-sustaining occurrences, as well as 93 percent of the species' remaining occurrences, currently receive protection and management through implementation of DBNF's LRMP. Therefore, we conclude that the goals and criteria outlined in the Recovery Plan have been achieved.

Summary of Comments and Recommendations

In the proposed rule published September 1, 2015 (80 FR 52717), we requested that all interested parties submit written comments on the proposal by November 2, 2015. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Legal notices inviting general public comment were published in the Lexington Herald-Leader and Louisville Courier Journal. We reopened the comment period on February 26, 2016 (81 FR 9798), in order to conduct peer review and provide interested parties an additional opportunity to comment on the proposed rule and draft post-delisting monitoring plan. We requested that all interested parties submit written comments by March 28, 2016.

During both comment periods for the proposed rule, we received a total of 14 comment letters or statements directly addressing the proposed action. These included 4 comment letters from peer reviewers and 10 comment letters from the general public that are posted on Federal docket no. FWS–R4–ES–2014–0054. All 4 peer reviewers and 7 of 10 public commenters supported the proposed action to delist white-haired goldenrod. Three public commenters objected to the proposed action.

Several public commenters simply expressed opposition to or support for the proposed delisting of *Solidago albopilosa* without providing any additional supporting information. We have noted those responses but, as stated in our proposed rule, submissions merely stating support for or opposition to the action under consideration without providing supporting information will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that a determination as to whether any species is a threatened or endangered species must be made ''solely on the basis of the best scientific and commercial data available.''

State and Peer Review Comments

In accordance with our peer review policy, which was published on July 1, 1994 (59 FR 34270), we solicited expert opinion on the proposed rule and the draft post-delisting monitoring plan from four knowledgeable, independent individuals with scientific expertise that includes familiarity with *Solidago albopilosa* and its habitat, biological needs, threats, and recovery efforts. We received responses from all four peer reviewers. All peer reviewers supported our conclusions and provided additional information, clarifications, and suggestions to improve the final rule.

Section 4(b)(5)(A)(ii) of the Act states that the Secretary must give actual notice of a proposed regulation under section 4(a) to the State agency in each State in which the species is believed to occur, and invite the comments of such agency. Section 4(i) of the Act directs that the Secretary will submit to the State agency a written justification for his or her failure to adopt regulations consistent with the agency's comments or petition. The Service submitted the proposed regulation to KNSPC, the State agency responsible for the conservation of listed plants in Kentucky. KSNPC's chief botanist provided peer review of the proposed rule.

We reviewed all comments received from the peer reviewers for substantive issues and new information regarding the delisting of white-haired goldenrod. Peer reviewer comments are addressed in the following summary.

Comment (1): Two peer reviewers stated that management may be needed beyond the period (5 years) covered by the post-delisting monitoring plan to address potential impacts from invasive plants and recreational activities (*e.g.,* hiking, rock climbing). This comment relates to just our PDM plan. Both reviewers commented that cooperative efforts among the Service, DBNF, and KSNPC should address any future threats to the species.

Our response: We agree with the reviewers that invasive plants and recreational use in some areas may adversely affect *S. albopilosa* occurrences in the future; however, the best scientific and commercial data available to the Service demonstrate that *S. albopilosa* is recovered and no longer requires the protection of the Act. Nonetheless, the Service intends to work closely with all Federal and State conservation agencies during the course of post-delisting monitoring. We will follow the benchmarks in the plan for evaluating success of efforts for this plant. We also believe protections outlined by DBNF's LRMP, which are described in the Recovery Criteria section of this document, will provide long-lasting benefits to the species. DBNF's LRMP was completed in 2004 and is still in effect, and USFS LRMPs are generally revised every 10 to 15 years or when conditions change significantly. Actually, the last LRMP to cover DBNF was in effect for 18 years (1985 to 2003). Also, on August 29, 2016, we finalized a cooperative management agreement among the Service, DBNF, and KSNPC that will provide for the long-term protection of the species until 2022.

Public Comments

Comment (2): Three commenters disagreed with the proposed delisting of white-haired goldenrod. In general, they stated that an insufficient number of protected, viable occurrences were known for delisting to be considered.

Our response: Under the Recovery Plan, *Solidago albopilosa* may be considered for delisting when 40 geographically distinct, self-sustaining occurrences are adequately protected and have been maintained for 10 years. Currently, a total of 46 geographically distinct occurrences are considered to be self-sustaining (viable) and adequately protected, and these occurrences have been maintained for more than 11 years. All remaining occurrences (of all ranks) will contribute to the viability and persistence of *S. albopilosa* into the future. Therefore, the recovery criteria for this species have been met. In addition, threats to this plant have been removed or reduced to a point where it no longer requires protection under the Act.

Comment (3): One commenter agreed with the delisting of *Solidago albopilosa* but stated that the State of Kentucky should conduct routine monitoring of rare plants, such as *S. albopilosa,* and pass legislation that protects these species.

Our response: Most *Solidago albopilosa* occurrences (about 95 percent) are located on Federal property (DBNF) and receive management and protection under DBNF's LRMP. The remaining occurrences are located on private property and, while they could benefit from protections provided by State legislation, the Service cannot

require a State to pass such legislation. With respect to monitoring and protection of rare plants like *S. albopilosa,* the DBNF and KSNPC have worked closely with the Service and other conservation partners over the past 20 years to implement conservation actions, including monitoring, that have benefited this and other rare species. We expect these collaborations to continue.

Summary of Changes From the Proposed Rule

We have considered all comments and information received during both comment periods for the proposed rule to delist white-haired goldenrod. In this final rule, we have made only minor changes based on comments received during the public comment period. We received supplementary information from DBNF on seed germination, seedling viability, and the potential threat posed by fungal infection. These details have been incorporated into this final rule.

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 species, reclassifying species, or removing species from listed status. We may determine that a species is an endangered or threatened species because of one or more of the five factors described in section 4(a)(1) of the Act:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) overutilization for commercial, recreational, scientific, or educational purposes;

(C) disease or predation;

(D) the inadequacy of existing regulatory mechanisms; or

(E) other natural or manmade factors affecting its continued existence.

We must consider these same five factors in delisting a species.

A recovered species is one that no longer meets the Act's definition of endangered or threatened. Determining whether the status of a species has improved to the point that it can be delisted or downlisted requires consideration of same five categories of threats identified above. This analysis is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the delisting and the removal of the Act's protections.

The following analysis examines all five factors currently affecting or that are likely to affect *S. albopilosa* within the foreseeable future. It contains updated information from that presented in the proposed rule (80 FR 52717, September 1, 2015).

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

The final rule to list *S. albopilosa* as threatened (53 FR 11612, April 7, 1988) identified the following habitat threats: ground disturbance and trampling associated with unlawful archaeological activities and recreational activities such as camping, hiking, and rock climbing. The species occupies a scenic and unique geological area that is heavily visited by hikers, campers, rock-climbers, and other nature enthusiasts. The U.S. Forest Service estimates recreational use of the Red River Gorge at approximately 500,000 visitor days per year (Taylor pers. comm. 2013). Recreational activities such as camping, hiking, and rock climbing can pose a threat to the species through inadvertent trampling and ground disturbance of *S. albopilosa* habitats. Evidence of trampling and ground disturbance within rock shelters has been observed repeatedly by KSNPC and DBNF personnel (KSNPC 2010, pp. 13–14).

Habitat disturbance and trampling associated with recreational activities (camping, hiking, and rock climbing) and archaeological looting in the past have posed a significant threat to the species. The Red River Gorge is a popular recreational area (Taylor pers. comm. 2013). Many trails and recreational areas within the Gorge are located near *Solidago albopilosa* occurrences, and rock shelters are often targeted as rock climbing, hiking, and camping sites. Use of rock shelters and cliff lines by campers, hikers, and rock climbers has contributed to physical habitat disturbance and has led to trampling of plants in rock shelters (Service 1993, p. 7; White and Drozda 2006, pp. 124–125; KSNPC 2010, pp. 13–14). In addition to habitat disturbance caused by recreationists, the presence of Native American artifacts within the Red River Gorge has contributed to digging and archaeological looting in *S. albopilosa* habitats (rock shelters). Approximately 18 *Solidago albopilosa* occurrences have been extirpated due to human activities, and many heavily visited rock shelters have been modified to the point that these habitats are no longer suitable for the species (KSNPC 2010, pp. 6–7).

According to the DBNF, impacts from archaeological looting are now infrequent, and these activities no longer pose a significant threat to *S. albopilosa* within the Red River Gorge (Taylor pers. comm. 2013). As for recreational impacts, most *Solidago albopilosa* occurrences are located in remote ravines of the Red River Gorge or grow along inaccessible cliff lines that are seldom visited or disturbed by campers, hikers, and rock climbers. Therefore, the threat magnitude at these sites is low.

Occurrences located in areas with more frequent visitor use, typically areas near DBNF and user-defined trails, generally have suffered more severe habitat disturbance and trampling in the past. Site protection and habitat management efforts by DBNF, working cooperatively with KSNPC and the Service, have helped to reduce the magnitude of threats at these sites. These occurrences have benefited from their location on the DBNF and management and protective actions provided under DBNF's LRMP (USFS 2004, pp. 1.1–1.10), which prevents general land disturbance and prohibits or limits logging and other DBNF-defined activities near cliffline habitats. The LRMP also protects rock shelters from vandalism and forbids removal of threatened and endangered species from these areas (see details in *Recovery Criteria* section).

The DBNF monitors these sites and protects them as needed through law enforcement efforts, construction of fences, trail diversion, and placement of signs. To protect occurrences from trampling, fire-building, and digging, signs have been posted at all entry points to the Red River Gorge asking visitors not to remove or disturb historical resources and providing visitors with biological and status information on *S. albopilosa.* Similar signs were also placed inside at least five archaeologically significant rock shelters that contained *S. albopilosa.* Beginning in February 2000, DBNF began to redirect trails and install fencing (chicken wire) around selected rock shelters (those with greatest visitation) containing *S. albopilosa.* Signs were also placed at these shelters, alerting visitors to the presence of the species and warning them against potential damage to plants. Signs and/or fencing were placed and have been maintained at a total of 21 occurrences, and DBNF personnel continue to visit these sites annually, checking the condition of signs and fencing and making repairs as needed.

Monitoring results show that implementation of DBNF's LRMP and the completion of additional conservation actions such as fencing and sign placement have had a positive effect on the species, the number of stems has increased, and the level of

habitat disturbance and trampling associated with recreational activities has been reduced (KSNPC 2010, 24 pp.). Of the 21 occurrences on the DBNF where fencing and signs were added, 20 are considered to be stable and the 1 declining occurrence will be protected through expanded fencing. Additional evidence that these conservation efforts have improved the status of *S. albopilosa* occurrences on the DBNF is the large number of stable occurrences (75) and the relatively high number of secure, self-sustaining occurrences (46) observed by DBNF, KSNPC, and the Service. The 46 secure, self-sustaining occurrences exceed the number identified in the recovery criteria to allow consideration of delisting.

Additional evidence that conservation actions have had a positive effect on the species is the relatively low recreational impacts observed by KSNPC (2010, pp. 13–14) at the majority of DBNF occurrences. Recreational impacts have been assessed by KSNPC since the mid-1990s (White and Drozda 2006, pp. 124–125; KSNPC 2010, pp. 13–14). Their qualitative ranking scheme estimates the percent disturbance of available habitat and uses a scale of 1 (little or no impact) to 5 (high impact, greater than 50 percent of available habitat disturbed) to produce a disturbance rank. Based on recent evaluations by KSNPC (KSNPC 2010, 40 pp.; White pers. comm. 2014), 70 occurrences (60 percent) are classified as low impact (rank of 1–2), 8 occurrences (7 percent) are classified as medium impact (rank of 3), and 39 occurrences (33 percent) are classified as high impact (rank of 4–5). Overall, 67 percent of DBNF's occurrences are considered to be exposed to low to medium recreational impacts. KSNPC (2010, p. 14) also noted that they did not observe many new recreational impacts during their surveys in 2008 and 2009. Most of the documented recreational impacts such as established trails, permanent structures within rock shelters (couches, chairs, fire pits), and camp sites had been in place since before *S. albopilosa* monitoring began in 1996 (KSNPC 2010, p. 14).

The six occurrences on privately owned lands currently do not benefit from any formal protection or management and, therefore, could face higher magnitude threats (*e.g.,* habitat disturbance) than those located on the DBNF. However, based on recent survey results by KSNPC, all six of these private occurrences have been ranked as ''stable,'' and five of the six are considered to be self-sustaining (A-, B-, or C-rank) (KSNPC 2010, p. 8). While these occurrences potentially could face a greater level of threats, they currently do not appear to be facing a greater level of impact, and they represent a small proportion (five percent) of the overall population of the species.

Summary of Factor A: Impacts associated with archaeological looting and recreational activities have been well documented in the past, but current monitoring data suggest that the magnitude of these threats has sufficiently decreased. Implementation of the DBNF's LRMP and specific conservation actions such as fencing and sign placement have had a positive effect on the species and have reduced the threat associated with recreational disturbance. The recovery goal of 40 stable, self-sustaining, protected occurrences has been exceeded by 6, and these trends have held for more than 10 years. Because we expect that the lands containing the 46 secure and self-sustaining occurrences will remain permanently protected in Federal ownership and will be managed to maintain or improve current habitat conditions (see Service 2016, entire), we find that the present or threatened destruction, modification, or curtailment of its habitat or range is no longer a threat to the continued existence of *S. albopilosa.*

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

Both the final rule to list *S. albopilosa* as threatened (53 FR 11612, April 7, 1988) and the Recovery Plan (Service 1993, p. 7) identified overutilization for recreational purposes as a threat to the species. However, while the use of habitat for recreational purposes, as discussed under Factor A, has impacted the species in the past, there is no evidence that the plant itself is or was utilized for commercial, recreational, scientific, or educational purposes. We, therefore, discuss impacts from recreational use of habitat for *S. albopilosa* under Factor A above.

Summary of Factor B: We conclude that overutilization is not a threat to *S. albopilosa.*

C. Disease or Predation

The listing rule for *S. albopilosa* (53 FR 11612, April 7, 1988) did not identify disease or predation as a threat to the species. Plants are occasionally browsed by herbivores, such as white-tailed deer (*Odocoileus virginianus*), wood rats (*Neotoma spp.*), and caterpillars (Order Lepidoptera), but we have no information that grazing by these species represents a threat to the species (Taylor 2016, pers. comm.). In 2014, the DBNF observed a rust fungus on the leaves in one population, but the fungus was not extensive within the population and did not appear to harm the plants. The fungus may have been triggered by weather conditions in 2014 and was not observed by DBNF in 2015 (Taylor 2016, pers. comm.).

Summary of Factor C: We continue to conclude that neither disease nor predation are threats to *S. albopilosa.*

D. The Inadequacy of Existing Regulatory Mechanisms

Populations of *S. albopilosa* within the DBNF are protected from damage and unauthorized taking by Federal regulation (36 CFR 261.9). This regulation would apply regardless of whether the species is listed because *S. albopilosa* would still be considered a sensitive, rare, or unique species on the DBNF under this Federal regulation. However, the final listing rule (53 FR 11612, April 7, 1988) identified inadequate regulatory mechanisms as a threat to *S. albopilosa* because limited manpower and the remoteness of many occurrences on the DBNF makes enforcement difficult. The DBNF has taken several steps to remedy this situation. As noted above, *S. albopilosa* receives management and protection through DBNF's LRMP and its conservation goals for the Cliffline Community Prescription Area. The National Forest Management Act (NFMA), and regulations and policies implementing the NFMA are the main regulatory mechanisms that guide land management on the DBNF, which contains 111 of the 117 extant occurrences of *S. albopilosa.* Since listing, the DBNF has included *S. albopilosa* and its habitat in its resource management plans. These plans are required by the NFMA and the Federal Land Policy and Management Act of 1976. The NFMA requires revision of the Plans every 15 years; however, plans may be amended or revised as needed. Management plans are required to be in effect at all times (in other words, if the revision does not occur, the previous plan remains in effect) and to be in compliance with various Federal regulations. We expect continued implementation of the LRMP and expect that any future revisions will consider conservation of *S. albopilosa* and its Cliffline Community habitats.

Specific actions that DBNF has taken under the LRMP include measures to reduce impacts of recreational activities to *S. albopilosa* and its habitat as discussed under Factor A. As discussed above, these and other protection and management actions taken by DBNF under their LRMP (USFS 2004, pp. 1.1–1.10) have been successful at improving the status of the species. Monitoring

results from these occurrences show that these efforts have had a positive effect on the species. Specifically, disturbance from trampling, camping, and rock climbing has been reduced in these areas, and the number of stems has increased.

The species is listed as endangered by the State of Kentucky (KSNPC 2005), but this designation conveys no legal protection to occurrences located on private property. Consequently, occurrences on privately owned land could face higher magnitude threats (*e.g.,* habitat disturbance) than those located on the DBNF. Based on recent survey results by KSNPC, however, only 6 of 117 extant *S. albopilosa* occurrences (5 percent) are located on private land, and 5 of these occurrences have been ranked as ''stable'' (A-, B-, or C-rank) by KSNPC (KSNPC 2010, p. 8). Therefore, based on this greater than 10-year data set, the majority of private occurrences are also stable.

Summary of Factor D: Occurrences of *S. albopilosa* located on the DBNF receive protection due to their location on Federal property, and these occurrences are managed and protected under DBNF's LRMP (USFS 2004, pp. 1.1–1.10). This protected status and management actions included in the LRMP will continue to provide adequate regulatory protection for these occurrences. Monitoring results show that DBNF's management actions have had a positive effect on the species. Specifically, disturbance from trampling, camping, and rock climbing has been reduced and the number of stems has stabilized or increased. Based on the best available information for both private and public lands occurrences, and the fact that existing regulatory mechanisms and associated management practices will continue on public lands, we conclude that existing regulatory mechanisms are adequate.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Other natural or manmade factors were first identified as a threat to *Solidago albopilosa* due to the species' specialized habitats (sandstone rock shelters and cliff habitats of the Red River Gorge) and the perceived vulnerability of these habitats to any physical or climatic change (52 FR 13798, April 24, 1987; 53 FR 11612, April 7, 1988). In the species' final listing rule (53 FR 11612) published in 1988, the Service concluded that even minor changes in the surrounding forest (*e.g.,* loss of canopy trees) could impact the species through drying, erosion, and competition with sun-tolerant species. At the time, these potential changes were not considered to be an imminent threat to white-haired goldenrod, but the final listing rule identified the need for management planning that would take into account the requirements of the species to ensure its continued existence.

Some surveys and status assessments of *Solidago albopilosa* identified several potential threats under Factor E. These included competition from invasive plants, the loss of eastern hemlock (*Tsuga canadensis*), low genetic diversity and small population size, and the effects of climate change (Service 2009a, p. 9; Service 2009b, p. 2; KSNPC 2010, pp. 13–14). KSNPC (2010, p. 14) reported several invasive plant species in habitats occupied by white-haired goldenrod, but the most common species included Japanese stilt grass (*Microstegium vimineum*), princess tree (*Paulownia tomentosa*), Japanese spiraea (*Spiraea japonica*), common chickweed (*Stellaria media*), and common mullein (*Verbascum thapsus*). Of the invasive plant species, Japanese stilt grass was the most common species. It was observed growing in direct competition with 23 *S. albopilosa* occurrences. However, invasive species were absent from 94 of 117 extant *S. albopilosa* occurrences (about 80 percent) and 53 of 81 stable occurrences (65 percent) (KSNPC 2010, p. 14; Service 2014, pp. 1–6). For the 23 occurrences in direct competition with invasive plants, most (16 of 23 (70 percent)) were stable or increased over the 10-year monitoring period (KSNPC 2010, p. 14; Service 2014, pp. 1–6).

We do not have data that specifically address the effects of climate change with regard to invasive species attributes such as distribution or range and the relation to white haired goldenrod. There are some data showing that more common aggressive invasive species like kudzu (*Pueraria lobata*) may expand into greater ranges due to possible effects of climate change (Bradley et al. 2009). However, species like Japanese stilt grass are more recent invaders to this area of the Southeast, and other than the data presented above, we do not have further information or data that indicates competition from invasive plants will change in significance as a threat to the species. Our current data suggest that Japanese stilt grass is not a significant threat to *S. albopilosa* as 70 percent of occurrences in direct competition with Japanese stilt grass were stable or increased over the last 10 years. Therefore, we do not believe that competition from invasive plants is a significant threat to the species now or in the foreseeable future.

The hemlock woolly adelgid (*Adeleges tsugae*), an aphid-like insect that is native to Asia, has been identified as a potential threat to *Solidago albopilosa* because it has the potential to severely damage stands of eastern hemlocks (*Tsuga canadensis*) that occur near rock shelters and cliffs occupied by the species (Service 2009b, p. 2; KSNPC 2010, p. 15). The hemlock woolly adelgid was introduced in the Pacific Northwest during the 1920s and has since spread throughout the eastern United States, reaching Kentucky by 2006. The species creates an extreme amount of damage to natural stands of hemlock, specifically eastern hemlock and Carolina hemlock (*Tsuga caroliniana*). The Recovery action plan (Service 2009b, p. 2) concluded that the loss of eastern hemlock within the Red River Gorge could result in microclimatic changes (increased light, decreased moisture, increased leaf litter) in and near rock shelters that may negatively affect white-haired goldenrod. Despite this potential threat, KSNPC (2010, p. 15) demonstrated in their evaluation that eastern hemlock was actually a minor component of the canopy surrounding rock shelters inhabited by the species. Consequently, the eventual loss of eastern hemlocks would not represent a significant change to the canopy surrounding these rock shelters and would, therefore, not represent a significant threat to the species.

Potential impacts that may be associated with low genetic variability such as inbreeding depression, reduced fitness, or reduced adaptive capacity (ability to respond to and adapt to changing conditions) have been identified as a potential threat to other listed plant species, but we have no information suggesting that low genetic variability affects *S. albopilosa* (53 FR 11614, April 7, 1988; Service 2009a, entire; KSNPC 2010, 24 pp.). Esselman and Crawford (1997, pp. 245–257) reported that *S. albopilosa* exhibits genetic diversity both within and between populations (genetic diversity is widely spread among populations, and populations are not genetically homogenous). The highest level of genetic diversity was observed within (as opposed to between) populations. Consequently, we do not believe that the potential effects associated with low genetic variability threaten the continued existence of *S. albopilosa* now or in the foreseeable future.

Some *Solidago albopilosa* occurrences may be more vulnerable to extirpation due to their small population size and poor estimated viability. The low number of stems

(typically less than 300), poor estimated viability, and high recreational impacts associated with D-ranked occurrences make these occurrences more vulnerable to stochastic events. Currently, 62 of the species' 117 extant occurrences (53 percent) are D-ranked. Even though these occurrences may be more vulnerable to extirpation, the overall threat to the species is minimal because these occurrences contain less than 20 percent of the species' total number of stems. Additionally, a small population size in and of itself is not indicative of being in danger of extinction, and this was likely never a naturally common or abundant species. Some *Solidago albopilosa* occurrences may have always had fewer plants in rock shelters with less favorable conditions (*e.g.,* small size, drier conditions).

The Intergovernmental Panel on Climate Change (IPCC) concluded that warming of the climate system is unequivocal (IPCC 2014, p. 3). Effects associated with changes in climate have been observed including changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, and wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves, and the intensity of tropical cyclones (IPCC 2014, p. 4). Species that are dependent on specialized habitat types, limited in distribution, or at the extreme periphery of their range may be most susceptible to the impacts of climate change (Byers and Norris 2011, p. 17; Anacker and Leidholm 2012, p. 2). However, while continued change is certain, the magnitude and rate of change is unknown in many cases. The magnitude and rate of change could be affected by many factors (*e.g.,* circulation patterns), but we have no additional information or data regarding these factors with respect to white-haired goldenrod.

There is evidence that some terrestrial plant populations have been able to adapt and respond to changing climatic conditions (Franks et al. 2013, entire). Both plastic (phenotypic change such as leaf size or phenology) and evolutionary (shift in allelic frequencies) responses to changes in climate have been detected. Both can occur rapidly and often simultaneously (Franks *et al.* 2013, p. 135). Relatively few studies are available, however, that (1) directly examine plant responses over time, (2) clearly demonstrate adaptation or the causal climatic driver of the responses, or (3) use quantitative methods to distinguish plastic versus evolutionary responses (Franks *et al.* 2013, p. 135).

To generate future climate projections across the range of white-haired goldenrod, one tool we used was the National Climate Change Viewer (NCCV), a climate-visualization Web site tool developed by the U.S. Geological Survey (USGS) that allows the user to visualize climate projections at the State, county, and watershed level (Adler and Hostetler 2013, entire; *http://www.usgs.gov/climate_landuse/clu_rd/nccv.asp*). Initially, the viewer was designed to provide information for States and counties on projected temperature and precipitation through the 21st century. The viewer was expanded in 2014 to provide information on associated projected changes in snowpack, soil moisture, runoff, and evaporative deficit for U.S. States and counties and for USGS Hydrologic Units or watersheds as simulated by a simple water-balance model. The model provides a way to simulate the response of the water balance to changes in temperature and precipitation in the climate models (30 separate models developed by the National Aeronautic and Space Administration). Combining the climate data with the water balance data provides further insights into the potential for climate-driven change in water resources. The viewer uses tools such as climographs (plots of monthly averages); histograms showing the distribution or spread of model simulations; monthly time series spanning 1950–2099; and tables that summarize changes (and extremes) in temperature and precipitation during these periods. The application also provides access to comprehensive, three-page summary reports for States, counties, and watersheds.

Using the NCCV and assuming the more extreme Representative Concentration Pathways (RCP) greenhouse gas emission scenario (RCP 8.5), in which greenhouse gas emissions continue to rise unchecked through the end of the century leading to an equivalent radiative forcing of 8.5 Watts m^2, we calculated projected annual mean changes for maximum temperature (+3.6 degrees Celsius (°C) (+6.5 degrees Fahrenheit (°F)), precipitation (+0.02–0.03 cm/day (+0.008–0.012 in/day)), runoff (−0.25 cm/month (−0.1 in/month), snowfall (−0.5 cm (−0.2 in)), soil storage (−2.5 cm (−1.0 in)), and evaporative deficit (+0.75 cm/month (+0.3 in/month)) for the period 2050–2074 in Menifee, Powell, and Wolfe Counties (Adler and Hostetler 2013, entire). Based on these results, all three counties within the range of *Solidago albopilosa* will be subjected to higher maximum temperatures (annual mean increase of 3.6 °C (6.5 °F)) and slightly higher precipitation (annual mean increase of 0.02–0.03 cm/day (+0.008–0.012 in/day)) relative to the period 1950–2005. Because the average annual increase in precipitation is predicted to be only slightly higher, the increased evaporative deficit and the loss in runoff, snowfall, and soil storage is primarily a result of higher maximum and minimum temperatures. The most dramatic shift is predicted for soil storage, which will decrease significantly between mid-May and late November relative to 1950–2005. Despite the slight increase in predicted precipitation, the coincident warming means that habitats are unlikely to maintain their current moisture status.

To evaluate the vulnerability of *Solidago albopilosa* to the effects of climate change, we also used NatureServe's Climate Change Vulnerability Index (CCVI) (Young *et al.* 2015, entire), a climate change model that uses downscaled climate predictions from tools such as Climate Wizard (Givertz *et al.* 2009, entire) and combines these with readily available information about a species' natural history, distribution, and landscape circumstances to predict whether it will likely suffer a range contraction and/or population reductions due to the effects of climate change. The CCVI uses an Excel platform that allows users to enter numerical or categorical weighted responses to a series of questions about risk factors related to species exposure and sensitivity to climate change. The CCVI separates vulnerability into its two primary components: A species' exposure to changes in climate within a particular assessment area and its inherent sensitivity to the effects of climate change. The tool gauges 20 scientifically documented factors and indicators of these components, as well as documented responses to climate change where they exist.

While the Index calculates anticipated increases or declines in populations of individual species, it also accommodates inherent uncertainties about how species respond within their ecological contexts. The CCVI generated a vulnerability rating of ''extremely vulnerable'' to ''highly vulnerable'' for white-haired goldenrod, suggesting that the species' abundance and/or range extent could change substantially or possibly disappear by 2050 (Young et al. 2015, p. 44). Factors influencing the species' high vulnerability were its poor movement/dispersal ability, its connection with uncommon geologic features, and its unique hydrological niche (humid, shaded rock shelters). Byers and Norris (2011, p. 16) completed a CCVI for plants in an

adjacent state, West Virginia, and concluded that top risk factors included poor dispersal ability, natural and anthropogenic barriers to dispersal, dependence on wetland habitats, restriction to areas with unique geology, and genetic bottlenecks (Byers and Norris 2011, p. 16).

Although the CCVI model (Young et al. 2015, entire) suggested that *Solidago albopilosa* is greatly exposed and sensitive to climate change and could be adversely affected in future years, Anacker and Leidholm 2012 (pp. 16–17) noted that there are a number of weaknesses associated with the CCVI: (1) It is weighted too heavily towards direct exposure to climate change (projected changes to future temperature and precipitation conditions that have high levels of uncertainties); (2) some important plant attributes are missing (mating system and pollinator specificity); (3) it is very difficult to complete scoring for a given species because some information is simply lacking; and (4) some scoring guidelines are too simplistic (Anacker and Leidholm (2012, pp. 16–17). Topographic complexity was considered to be a potential complementary factor in assessing vulnerability to climate change (Anacker and Leidholm 2012, pp. 12–16). Topographically complex areas, such as the Red River Gorge region, have been predicted to be less vulnerable to the effects of climate change (Anacker and Leidholm 2012, pp. 15–16), so species such as *Solidago albopilosa* may also be less vulnerable to such effects as compared to plants that occur in areas with low topographic complexity.

Additionally, Phillips (2010, entire) found that efforts to predict responses to climate change and to interpret both modern and paleoclimate indicators are influenced by several levels of potential amplifiers, which can either increase or exaggerate climate impacts, and/or filters, which reduce or mute impacts. He notes that climate forcings (factors that drive or ''force'' the climate system to change such as the energy output of the sun, volcanic eruptions, or changes in greenhouse gases) are partly mediated by ecological, hydrological, and other processes that may amplify or filter impacts on surface processes and landforms. For example, resistance or resilience of geomorphic systems may minimize the effects of changes. Thus, a given geomorphic response to climate could represent amplification and/or filtering (Phillips 2010, p. 571). Due to white-haired goldenrod's habitat specificity in rock shelters and cliff overhangs, the effects of climate change are likely muted or diminished due to this species' specific habitat conditions.

Based on observations of climatic conditions over a period of 25 years (KSNPC (2010, p. 13), there is some biological and historical evidence to suggest that *S. albopilosa* is adapted to endure some of the potential effects of climate change, including more frequent droughts and an estimated 2.6–3.6 °C (4.7–6.5 °F) increase in average annual maximum temperature. Habitats within the Red River Gorge often experience multiyear droughts, and *S. albopilosa* occurrences can become stressed during these periods. For example, the Cumberland Plateau region of Kentucky experienced a several-year drought prior to KSNPC's 2008–2009 survey. These dry conditions continued during 2008, and KSNPC observed many drought-stressed occurrences. The following year (2009) was relatively wet, and several of these drought-stressed occurrences quickly improved (KSNPC 2010, p. 13). Despite this most recent dry period and others in the past, the species has demonstrated a resiliency to prolonged periods of drought. Although downscaling models exist at the county level (Alder and Hostetler 2013), we do not have data at the proper scale (inside rock shelters or in cliff overhangs) to determine, for example, how the species is affected by decreased relative humidity during a drought year, but periodic drought may be a normal cyclical event needed to increase production. The shaded, cooler, and more humid environment of rock shelters (Nieves and Day 2014, p. 7) and the topographic complexity of the Red River Gorge region (Anacker and Leidholm 2012, pp. 15–16) may offer some relief from drying and may contribute to the species' ability to survive these conditions.

Although climate change is almost certain to affect terrestrial habitats in the Red River Gorge region of Kentucky (Adler and Hostetler 2013, entire), there is uncertainty about the specific effects of climate change on white-haired goldenrod. Currently, we have no evidence that climate change effects observed to date have had any adverse impact on *S. albopilosa* or its habitats, and we are uncertain about how projected future changes in temperature, precipitation, and other factors will influence the species. However, the best available information indicates that the effects of climate change do not represent an imminent threat now or in the foreseeable future.

Summary of Factor E: Other potential threats such as minor vegetational changes in the surrounding forest, competition with invasive species, low genetic variability, small population size, and the effects of climate change have been identified as potential threats to *S. albopilosa.* Invasive species occur in only 23 of 117 extant occurrences, and most of these occurrences (16) have remained stable. We do not expect the loss of eastern hemlock to have a significant impact on the species because eastern hemlock is a minor component of the forest canopy surrounding *S. albopilosa* occurrences. The potential effects of low genetic diversity do not represent a threat as the species has relatively high genetic diversity. Small populations may be vulnerable to stochastic events, but these occurrences contain only a small proportion of the species' total number of stems. We do not consider climate change to be an imminent threat based on the species' current status, its demonstrated resiliency to periods of drought, and our uncertainty regarding the species' vulnerability to the effects of climate change. Based on all these factors, we find that other natural or manmade factors considered here are no longer a significant threat to *S. albopilosa.*

Overall Summary of Factors Affecting White-Haired Goldenrod

The primary factors that led to white-haired goldenrod's listing under the Act were its limited range and habitat threats associated with ground disturbance and trampling caused by unlawful archaeological activities and recreational activities such as camping, hiking, and rock climbing. Other factors included the inadequate protection of occurrences on the DBNF and potential minor vegetational changes in forests surrounding *Solidago albopilosa* occurrences. We have carefully assessed the best scientific and commercial information available regarding the threats faced by white-haired goldenrod. These threats have been removed or ameliorated by conservation actions of multiple conservation partners for more than 20 years. These activities and other management actions included in the DBNF's LRMP (USFS 2004, pp. 3.5–3.8) have assisted in recovery of the species as reflected in the large number of stable, self-sustaining, protected occurrences (46), and the long period (greater than 11 years) during which this trend has been maintained. Furthermore, a new cooperative management agreement among the Service, DBNF, and KSNPC was signed on August 29, 2016, and will provide for the long-term protection of the species.

Based on our assessment of factors potentially impacting the species and its habitat, the species' improved status (a

sufficient number of viable occurrences), and multiple conservation efforts by the Service and its partners, we conclude that *Solidago albopilosa* is not in danger of extinction throughout all of its range or likely to become endangered within the foreseeable future throughout all of its range.

Determination

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 and removing species from the Federal Lists of Endangered and Threatened Wildlife and Plants. An assessment of the need for a species' protection under the Act is based on whether a species is in danger of extinction or likely to become so because of any of five factors as required by section 4(a)(1) of the Act. We conducted a review of the status of this species and assessed the five factors to evaluate whether *Solidago albopilosa* is endangered or threatened throughout all of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by *Solidago albopilosa* and its habitat. We reviewed the information available in our files and other available published and unpublished information, and we consulted with recognized experts and other Federal and State agencies.

In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the exposure causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant the threat is. If the threat is significant, it may drive, or contribute to, the risk of extinction of the species such that the species warrants listing as endangered or threatened as those terms are defined by the Act. This determination does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of an endangered species or threatened species under the Act.

During our analysis, we did not identify any factors that reach a magnitude that threaten the continued existence of the species. Significant impacts at the time of listing that could have resulted in the extirpation of all or parts of populations have been eliminated or reduced since listing, and we do not expect any of these conditions to substantially change post-delisting and into the foreseeable future. We conclude that the previously recognized impacts to *Solidago albopilosa* from the present or threatened destruction, modification, or curtailment of its habitat or range (Factor A), the inadequacy of regulatory mechanisms (Factor D), and minor vegetational changes in the surrounding forest (Factor E), have been ameliorated or reduced such that *S. albopilosa* is no longer in danger of extinction throughout all of its range or likely to become endangered within the foreseeable future throughout all of its range. We, therefore, conclude that *S. albopilosa* does not meet the definition of a threatened species, nor is it likely to become so in the foreseeable future.

Significant Portion of the Range Analysis

Background

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so throughout all or a significant portion of its range. Having determined that *Solidago albopilosa* is not endangered or threatened throughout all of its range, we next consider whether there are any significant portions of its range in which *Solidago albopilosa* is in danger of extinction or likely to become so. We published a final policy interpreting the phrase ''Significant Portion of its Range'' (SPR) (79 FR 37578; July 1, 2014). In pertinent part, the final policy states that (1) if a species is found to be endangered or threatened throughout a significant portion of its range, the entire species is listed as endangered or threatened, respectively, and the Act's protections apply to all individuals of the species wherever found; (2) a portion of the range of a species is ''significant'' if the species is not currently endangered or threatened throughout all of its range, but the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range; and (3) the range of a species is considered to be the general geographical area within which that species can be found at the time the Service makes any particular status determination.

The procedure for analyzing whether any portion is an SPR is similar, regardless of the type of status determination we are making. The first step in our analysis of the status of a species is to determine its status throughout all of its range. If we determine that the species is in danger of extinction, or likely to become endangered in the foreseeable future throughout all of its range, we list the species as an endangered species or threatened species and no SPR analysis will be required. If the species is neither in danger of extinction nor likely to become so throughout all of its range, as we have found here, we next determine whether the species is in danger of extinction or likely to become so throughout a significant portion of its range. If it is, we will continue to list the species as an endangered species or threatened species, respectively; if it is not, we conclude that listing the species is no longer warranted.

When we conduct an SPR analysis, we first identify any portions of the species' range that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that have no reasonable potential to be significant or in analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To identify only those portions that warrant further consideration, we determine whether substantial information indicates 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 determination that a species is in danger of extinction in a significant portion of its range is whether the threats are geographically concentrated in some way. If the threats to the species are affecting it uniformly throughout its range, no portion is likely to have a greater risk of extinction, and thus would not warrant further

consideration. Moreover, if any concentration of threats apply only to portions of the range that clearly do not meet the biologically based definition of ''significant'' (*i.e.,* the loss of that portion clearly would not be expected to increase the vulnerability to extinction of the entire species), those portions would not warrant further consideration. We emphasize that answering these questions in the affirmative is not a determination that the species is endangered or threatened throughout a significant portion of its range—rather, it is a step in determining whether a more detailed analysis of the issue is required.

If we identify any portions that may be both (1) significant and (2) endangered or threatened, we engage in a more detailed analysis to determine whether these standards are indeed met. The identification of an SPR does not create a presumption, prejudgment, or other determination as to whether the species in that identified SPR is endangered or threatened. We must go through a separate analysis to determine whether the species is endangered or threatened in an SPR. To determine whether a species is endangered or threatened throughout an SPR, we will use the same standards and methodology that we use to determine if a species is endangered or threatened throughout its range.

Depending on the biology of the species, its range, and the threats it faces, it may be more efficient to address the ''significant'' 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.''

SPR Analysis for White-Haired Goldenrod

Applying the process described above, in considering delisting *S. albopilosa,* we evaluated the range of this plant to determine if any areas could be considered a significant portion of its range. While there is some variability in the habitats occupied by *S. albopilosa* across its range, the basic ecological components required for the species to complete its life cycle (*e.g.,* adequate sunlight, shade, moisture, soils) are present throughout the habitats occupied by the species. 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. The currently occupied range of *S. albopilosa* encompasses approximately 114 km^2 (44 mi^2) in Menifee, Powell, and Wolfe Counties, KY. Based on examination of information on the biology and life history of the species, we determined that there are no separate areas of the range that are significantly different from others or that are likely to be of greater biological or conservation importance than any other areas.

We next examined whether any threats are geographically concentrated in some way that would indicate the species could be in danger of extinction, or likely to become so, in that area. Through our review of potential threats, we identified some areas where *Solidago albopilosa* may experience greater threats or a greater likelihood of extirpation and, therefore, may be in danger of extinction or likely to become so in those areas. These include occurrences on private lands and occurrences that are not currently considered self-sustaining. The majority (94.8 percent) of *Solidago albopilosa* occurrences are now located on DBNF and benefit from management and conservation actions implemented under the LRMP. The remaining (6 of the 117) extant occurrences are located on private lands. As explained above, these occurrences currently do not benefit from any formal protection or management and, therefore, could face higher magnitude threats. While these occurrences do not receive any formal protection, five of the six occurrences are considered to be stable and self-sustaining, indicating a low level of current impacts to those occurrences. Although the occurrences on private lands could face greater threats in the future due to lack of formal protections, these occurrences represent only 5 percent of extant occurrences and a very small proportion of the range of the species. Additionally, even if future potential threats were to cause the loss of these occurrences, that loss would not appreciably reduce the long-term viability of the species, much less cause the species in the remainder of its range to be in danger of extinction or likely to become so.

We also evaluated whether the occurrences that are not considered self-sustaining could be considered a significant portion of the species' range. We have determined that 46 secure and self-sustaining occurrences presently are distributed throughout the species' range, which accounted for more than 75 percent of the total stems estimated to exist in 2013. Of the remaining 71 extant occurrences, the 6 occurrences on private lands are not considered secure (but all 6 have been shown to be stable, and 5 have been shown to be self-sustaining). These occurrences were discussed above.

The remaining 65 occurrences are on DBNF land, and thus protected, but currently are not considered self-sustaining. Some of these occurrences have a status of declining or their status is unknown, while others are considered not self-sustaining primarily due to poor estimated viability and low number of stems observed. These occurrences could be at greater risk of extinction due to vulnerability to demographic and environmental stochasticity because of their smaller population sizes. These 65 occurrences, along with the 6 occurrences on private lands, account for the remaining 25 percent of the total stems estimated to exist in 2013. The threats to these occurrences from recreational activities are being managed and are not different from the threats affecting the 46 secure, self-sustaining occurrences.

Because these 46 occurrences exhibit stable or increasing trends, contain a relatively high number of stems, have fair to excellent viability, and exhibit relatively high reproductive rates, we expect these occurrences to persist into the future. While most of the remaining occurrences also receive protections and are not at immediate risk of extirpation, their lower population sizes and poorer viability put them at a greater risk of extirpation. However, while these occurrences may have a greater potential to become extirpated due to demographic or environmental stochasticity, the loss of some or all of those occurrences would not cause the species in the remainder of its range to be in danger of extinction or likely to become so.

In conclusion, we have determined that none of the existing or potential threats, either alone or in combination with others, are likely to cause *S. albopilosa* to be in danger of extinction throughout all or a significant portion of its range, nor is it likely to become endangered within the foreseeable future throughout all or a significant portion of its range. On the basis of this evaluation, we conclude *S. albopilosa* no longer requires the protection of the Act, and remove *S. albopilosa* from the Federal List of Endangered and Threatened Plants (50 CFR 17.12 (h)).

Conservation Measures

Section 4(g)(1) of the Act requires us, in cooperation with the States, to implement a monitoring program for not less than 5 years for all species that have been delisted due to recovery. Post-delisting monitoring (PDM) refers to

activities undertaken to verify that a species that has been delisted due to recovery remains secure from the risk of extinction after the protections of the Act no longer apply. The primary goal of PDM is to ensure that the species' status does not deteriorate, and if a decline is detected, to take measures to halt the decline so that proposing it as threatened or endangered is not again needed. If, at any time during the monitoring period, data indicate that protective status under the Act should be reinstated, we can initiate listing procedures, including, if appropriate, emergency listing under section 4(b)(7) of the Act. At the conclusion of the monitoring period, we will review all available information to determine if relisting, the continuation of monitoring, or the termination of monitoring is appropriate.

Post-Delisting Monitoring (PDM) Plan Overview

In August 2016, the Service finalized a final PDM plan in cooperation with DBNF and KSNPC (Service 2016, entire). The 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; and

(6) Provides a post-delisting monitoring implementation schedule including timing and responsible parties.

We will post the final PDM plan and any future revisions if necessary on our national Web site (*http://endangered.fws.gov*) and on the Kentucky Fish and Wildlife Office's Web site (*http://www.fws.gov/frankfort*).

Effects of the Rule

This final rule revises 50 CFR 17.12 by removing *Solidago albopilosa* from the Federal List of Endangered and Threatened Plants. Therefore, as of the effective date of this rule (see **DATES**), the prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, no longer apply to white-haired goldenrod. Removal of *S. albopilosa* from the Federal List of Endangered and Threatened Plants relieves Federal agencies from the need to consult with us under section 7 of the Act.

Required Determinations

National Environmental Policy Act

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), need not be prepared in connection with regulations pursuant to section 4(a) of the 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 the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. We have determined that no tribal lands or interests are affected by this rulemaking action.

References Cited

A complete list of all references cited in this final rule is available at *http://www.regulations.gov* at Docket No. FWS–R4–ES–2014–0054, or upon request from the Kentucky Fish and Wildlife Office (see **ADDRESSES**).

Authors

The primary author of this rule is Dr. Michael A. Floyd in the Service's Kentucky Fish and Wildlife Service Office (see **ADDRESSES** and **FOR FURTHER INFORMATION CONTACT**).

List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

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

PART 17—[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.

§ 17.12 [Amended]

■ 2. Amend § 17.12(h) by removing the entry for ''*Solidago albopilosa*'' under ''FLOWERING PLANTS'' from the List of Endangered and Threatened Plants.

Dated: September 28, 2016.

Stephen Guertin,

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

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