



DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R5-ES-2024-0058; FXES1113090FEDR-256-FF09E22000]

RIN 1018-BF57

Endangered and Threatened Wildlife and Plants; Removal of Virginia Sneezeweed from the List of Endangered and Threatened Plants

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to remove Virginia sneezeweed (*Helenium virginicum*) from the Federal List of Endangered and Threatened Plants. Our review indicates that the threats to Virginia sneezeweed 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 (Act). Accordingly, we propose to delist Virginia sneezeweed. If we finalize this rule as proposed, the prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, would no longer apply to Virginia sneezeweed.

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. eastern time on the closing date. We must receive requests for a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

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

(1) *Electronically*: Go to the Federal eRulemaking Portal: <https://www.regulations.gov>.

In the Search box, enter FWS-R5-ES-2024-0058, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the Search panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on “Comment.”

(2) *By hard copy*: Submit by U.S. mail to: Public Comments Processing, Attn: FWS-R5-ES-2024-0058, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

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

Availability of supporting materials: This proposed rule and supporting documents, including the 5-year review and the draft Recovery Plan, are available online at <https://www.regulations.gov> under Docket No. FWS-R5-ES-2024-0058 and on the Service’s Northeast Region website at <https://www.fws.gov/species/virginia-sneezeweed-helenium-virginicum>, and in person at the Virginia Field Office (see **FOR FURTHER INFORMATION CONTACT**).

FOR FURTHER INFORMATION CONTACT: Troy Andersen, Field Office Supervisor, Virginia Field Office, 6669 Short Lane, Gloucester, VA 23061; telephone: 804–728–0695.

Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States. Please see Docket No. FWS-R5-ES-2024-0058 on <https://www.regulations.gov> for a document that summarizes this proposed rule.

SUPPLEMENTARY INFORMATION:

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible.

Therefore, we request comments or information from other concerned governmental agencies, Native American tribes, the scientific community, industry, or any other interested parties concerning this proposed rule.

We particularly seek comments concerning:

(1) Reasons we should or should not remove Virginia sneezeweed from the List of Endangered and Threatened Plants;

(2) Relevant data concerning any threats (or lack thereof) to Virginia sneezeweed, particularly any data on the possible effects of climate change as it relates to habitat, as well as the extent of State protection and management that would be provided to this plant as a delisted species;

(3) Current or planned activities within the geographic range of Virginia sneezeweed that may have either a negative or positive impact on the species; and

(4) Considerations for post-delisting monitoring, including monitoring protocols and length of time monitoring is needed, as well as triggers for reevaluation.

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

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

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

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

Our final determination may differ from this proposal because we will consider all comments we receive during the comment period as well as any information that may become available after this proposal. For example, based on the new information we receive (and any comments on that new information), we may conclude that the species should remain listed as threatened, or we may conclude that the species should be reclassified from threatened to endangered. We will clearly explain our rationale and the basis for our final decision, including why we made changes, if any, that differ from this proposal.

Public Hearing

Section 4(b)(5) of the Act (16 U.S.C. 1533(b)(5)) provides for a public hearing on this proposal, if requested. Requests must be received by the date specified above in **DATES**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule a public hearing on this proposal, if requested, and announce the date, time, and place of the hearing, as well as how to obtain reasonable accommodations, in the *Federal Register* and local newspapers at least 15 days before the hearing. We may hold the public hearing in person or virtually via webinar. We will announce any public hearing on our website, in addition to the *Federal Register*. The use of these virtual public hearings is consistent with our regulation at 50 CFR 424.16(c)(3).

Peer Review

In accordance with our joint policy on peer review published in the *Federal Register* on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we will seek independent scientific reviews from at least three appropriate and independent specialists regarding scientific data and interpretations contained in this proposed rule. We will send copies of this proposed rule to the peer reviewers immediately following publication in the *Federal Register*. We will ensure that the opinions of peer reviewers are objective and unbiased by following the guidelines set forth in the August 22, 2016, memorandum, which updates and clarifies Service policy on peer review (U.S. Fish and Wildlife Service 2016). The purpose of such review is to ensure that our decisions are based on scientifically sound data, assumptions, and analysis. Accordingly, our final decision may differ from this proposal. Comments from peer reviewers will be posted at <https://www.regulations.gov> and included in the decision file for the final rule.

Previous Federal Actions

On November 28, 1983, we published a notice of review in the *Federal Register* (48 FR 53640) covering all native plants being considered for listing as endangered or threatened; we included Virginia sneezeweed in this notice as a category 2 candidate species. We defined category 2 candidates as those taxa for which we had information indicating that listing may be warranted but for which we lacked sufficient information on status and threats to support issuance of proposed listing rules. We retained Virginia sneezeweed as a category 2 candidate species in 1985 (50 FR 39526; September 27, 1985).

In 1990, we designated Virginia sneezeweed as a category 1 candidate species (55 FR 6207; February 21, 1990), and we retained the species as a category 1 candidate in 1993 (58 FR 51144; September 30, 1993), based largely on the fieldwork completed by the Virginia Department of Conservation and Recreation's Division of Natural Heritage (VDCR-DNH) in 1990 and 1991. We defined category 1 candidates as those taxa for which we had on file

sufficient information on biological vulnerability and threats to support preparation of listing proposals.

In a notice of review published in the *Federal Register* on February 28, 1996 (61 FR 7596), we ceased using category designations and recognized Virginia sneezeweed as simply a candidate species. Candidate species are those taxa for which we have on file sufficient information on biological vulnerability and threats to support proposals to list the species as endangered or threatened.

On September 29, 1997, we published in the *Federal Register* (62 FR 50896) a proposed rule to list Virginia sneezeweed as a threatened species under the Act, and on November 3, 1998, we published in the *Federal Register* (63 FR 59239) a final rule listing Virginia sneezeweed as a threatened species under the Act. The final listing rule included our finding that designating critical habitat was not prudent for the species.

In September 2000, a draft recovery plan for Virginia sneezeweed was completed (Service 2000, entire). On October 2, 2000, we published in the *Federal Register* (65 FR 58784) a notice of availability of the draft recovery plan.

We published notices initiating a 5-year review for the species on December 16, 2008 (73 FR 76373), March 6, 2012 (77 FR 13251), and August 8, 2018 (83 FR 39113).

In April 2020, a 5-year review was completed (Service 2020, entire). This review concluded that Virginia sneezeweed's status had substantially improved since listing and recommended delisting the species.

Background

Species Information

For more information on the description, biology, ecology, and habitat of Virginia sneezeweed, refer to the final listing rule (63 FR 59239; November 3, 1998), the Virginia Sneezeweed (*Helenium virginicum*) Recovery Plan (draft) (Service 2000, entire), and the Virginia Sneezeweed (*Helenium virginicum*) 5-Year Review: Summary and Evaluation (Service

2020, entire). These documents are available as supporting materials at <https://www.regulations.gov> under Docket No. FWS-R5-ES-2024-0058.

Taxonomy and Species Description

Virginia sneezeweed (*Helenium virginicum*) is a perennial herbaceous flowering plant in the aster family (Asteraceae), first described in 1936 by S.F. Blake in Augusta County, Virginia (Blake 1936, entire). Virginia sneezeweed ranges in height from 43 to 112 centimeters (approximately 1.4 to 3.7 feet) above a rosette of basal leaves (Knox 1987, p. 55). Coarse hairs are visible on the basal and lower stem leaves. The basal leaves may be broad in the middle tapering toward the ends, but otherwise may appear oblong. Stem leaves are lance-shaped and become progressively smaller from the base to the tip of the stem. The stems are winged, with the wings being continuous with the base of the stem leaves. The flower ray petals are yellow and wedge-shaped with three lobes at the ends. The central disk of the flower is nearly ball-shaped. Flowering occurs from July to October. Virginia sneezeweed is separated from the closely related species of common sneezeweed (*H. autumnale*) based on multiple morphological and ecological differences, including height, blooming period, bolting date, pappus length, and longer basal leaves (Knox 1987, entire).

Distribution and Habitat

Historically, Virginia sneezeweed was first identified on the shores of shallow, seasonally flooded ponds in Virginia's Shenandoah Valley. At the time of listing in 1998, the species was present at 30 sites that were grouped into 25 populations based on proximity distance in Virginia, and one suspected additional occurrence of the species in Howell County, Missouri, had been identified. Since listing, this suspected occurrence has been confirmed as Virginia sneezeweed, and an additional 55 element occurrences (EOs) have been discovered in the south-central Missouri Ozarks as a result of expanded survey efforts in those areas.

In 2005, VDCR-DNH revised its occurrence data to follow NatureServe guidance protocol for distinguishing EOs (NatureServe 2008). The protocol recommended that two

occurrence features separated by less than 1 kilometer be treated as the same occurrence (population). After this occurrence data revision, VDCR-DNH grouped the original 30 sites into 19 EOs in Virginia (Van Alstine 2009, p. 2). Plants have been observed at three additional sites in Virginia since 2005, but all have been grouped into existing EOs due to proximity to other populations. Additionally, one EO was discovered in Hamilton County, Indiana, on August 14, 2018 (Service 2020, p. 11). In total, the best available information indicates the existence of 76 EOs of Virginia sneezeweed across three States (Virginia, Missouri, and Indiana) and four physiographic provinces (the Blue Ridge and Ridge and Valley in Virginia, the Plains in Indiana, and the Ozark Plateau in Missouri).

Virginia sneezeweed's optimal habitat includes fluctuating water levels, little canopy cover, and acidic-to-circumneutral soils with high organic matter. Persistent shading, flooding, and drought appear detrimental to populations. Populations of Virginia sneezeweed occurring in Virginia and Missouri are found in open (unshaded) growing conditions. The draft recovery plan (Service 2000, entire) cites the species as being limited to seasonally flooded sinkhole ponds (Knox 1997, p. 237), which is a globally rare habitat. Additional observations indicate that it can also be found in disturbed sites that appear as seasonally wet meadows, depressions in lawns, roadside ditches, and margins of farm ponds in Virginia (Van Alstine 2009, p. 1). In Missouri, Virginia sneezeweed habitat also ranges from less disturbed sinkhole pond margins and wet meadows to temporary wetlands in hayfields, roadside ditches, cattle ranches, and rural airports (Rimer and Summers 2006, p. 520). The species' habitat needs seem to be met naturally in sinkhole ponds by the variable hydroperiod, soil chemistry, pond basin morphology, and water depth; other sites where the species occurs may be the result of human activities that keep the sites open and help to meet the hydrologic needs of Virginia sneezeweed. The species appears to outcompete other plants in such circumstances, which explains its occurrence in highly altered habitats such as cattle ranches, airports, and roadside ditches (Knox et al. 2016, p. 257).

Biology

Virginia sneezeweed employs a breeding system of self-incompatibility, which puts small populations at risk of local extinction (Messmore and Knox 1997, entire). It blooms from early July through October with a peak in late July to early August. Seed dispersal occurs in late fall, and dormancy is broken gradually, with most germination delayed until the next growing season after water has drawn down (Knox 1997, p. 237).

The species experiences short-term local extirpation of aboveground plants due to high fluctuations in water levels and specific soil chemistry, but the species is adapted to the stress induced by these fluctuations in habitat condition by maintaining an intact seed bank that allows the plants to regenerate when conditions become favorable. Water depth and duration of standing water in Virginia sneezeweed habitats varies greatly year to year (Knox et al. 1999, p. 96); population sizes and stage class abundances also vary greatly year to year (Knox et al. 1999, p. 97). Seed stored below ground for at least 11 years retained a high percentage of germinability (Adams et al. 2005, p. 427).

Virginia sneezeweed appears as a basal rosette of leaves in the first year and then in its second year usually bolts, producing a single flowering stem that can include 1 to 15 flowering heads (Messmore and Knox 1997, p. 319). Virginia sneezeweed can live up to 5 years and flower two to three times (Knox 1997, p. 242). There is limited evidence of vegetative reproduction under experimental conditions, but this has not been observed in the field. Individual plants nearly always comprise genets (groups of genetically identical plants, Knox 1997, p. 237). The dense mats of rosettes seen in some populations, therefore, probably reflect seed dispersal patterns.

Recovery Criteria

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

Recovery plans provide a roadmap for us and our partners on methods of enhancing conservation and minimizing threats to listed species, as well as measurable criteria against which to evaluate progress towards recovery and assess the species' likely future condition. However, they are not regulatory documents and do not substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of a species or to delist a species is ultimately based on an analysis of the best scientific and commercial data available to determine whether a species is no longer an endangered species or a threatened species, regardless of whether that information differs from the recovery plan.

There are many paths to accomplishing recovery of a species, and recovery may be achieved without all of the criteria in a recovery plan 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 that the species is robust enough that it no longer meets the Act's definition of an endangered species or a threatened species. In other cases, we may discover new recovery opportunities after having finalized the recovery plan. Parties seeking to conserve the species may use these opportunities instead of methods identified in the recovery plan. Likewise, we may learn new information about the species after we finalize the recovery plan. The new information may change the extent to which existing criteria are appropriate for identifying recovery of the species. The recovery of a species is a dynamic process requiring adaptive management that may, or may not, follow all of the guidance provided in a recovery plan.

The listing of the Virginia sneezeweed spurred greater survey effort and ensured that protections were secured for populations, inextricably linking these efforts to recovery. The draft Virginia sneezeweed recovery plan (Service 2000, p. 23) states that the primary objective of the

recovery program is to enable removal of the species from the List of Endangered and Threatened Plants. It established five conditions as criteria for delisting.

Delisting Criterion 1: Twenty self-sustaining populations and their habitats are permanently protected across this species' Virginia range. Minimal management actions may be occasionally required.

At the time of listing, there were 25 known populations of the species in Virginia across 30 individual sites and one suspected, but not confirmed, occurrence in Missouri. As noted above, the population figure was subsequently revised downward to 19 populations across the 30 sites due to the proximity of some occurrences. Five of the original 25 populations were located on U.S. Forest Service (USFS) lands, and the remaining 20 were on private lands. The purpose of the first delisting criterion was to increase the number of populations persisting in protected habitats with limited need for active management to sustain them. When met, the criterion would reflect a resulting increase in the species' viability.

The specific number of permanently protected populations identified in the criterion has not been met. However, new information obtained since the draft recovery plan (Service 2000, entire) was written provides new context for assessing the species' viability. When this criterion was written, the species was confirmed only in Virginia. The draft recovery plan indicates that if the need for additional survey work in Missouri and intervening States is indicated by the genetic confirmation of the first Missouri site as Virginia sneezeweed, the number of populations to be protected would be reassessed. The species has since been confirmed to occur in Missouri and Indiana, resulting in a total of 76 known populations (EOs) across three States; however, this recovery criterion was not revised or finalized to reflect and consider the new information.

Of the 76 total EOs across the species' range, a total of 15 EOs (20 percent of all EOs) occur on State or Federal lands offering permanent protection (see table 1, below). In Virginia, two EOs are on State-owned land (VDCR) and six EOs are on Federal land (USFS). The EOs on State-owned land are within Natural Area Preserves specifically dedicated to preserving the rare

sinkhole pond habitats where Virginia sneezeweed occurs. The USFS manages the wetland areas where Virginia sneezeweed occurs on USFS land because they are rich in biodiversity, karst features, vernal pools, and cultural resources. Current protection and management efforts for these eight EOs will continue regardless of whether Virginia sneezeweed remains a federally listed species (Wright 2019, pers. comm.). In Missouri, six EOs are on State-owned land (Missouri Department of Conservation (MDC)), where they are protected from disturbance that might be detrimental; a change in Federal listing status is unlikely to change these protections and beneficial management (Rimer 2019b, pers. comm.). In Indiana, the single EO is on a 127-acre parcel with 42 acres designated as a State Nature Preserve and 85 acres under a conservation easement governed by the Indiana Department of Natural Resources (Stolz 2019, pers. comm.). The EO occurs on the conservation easement portion of the property. Given that these protections were in place prior to the discovery of this population, a change in listing status for Virginia sneezeweed would not change current protections for the Indiana population.

In Missouri, an additional six EOs (8 percent of all EOs) are on Missouri Department of Transportation (MoDOT) and Howell County Road Commission rights-of-way. While these are not considered protected based on land ownership, MoDOT has worked in partnership with MDC and the Service to implement informed and active site management (e.g., scheduling/planning spraying or mowing to minimize impacts to Virginia sneezeweed on site). The MoDOT environmental review process ensures that they are aware of Virginia sneezeweed locations. MDC provides updated information quarterly to MoDOT via a cooperative agreement to ensure that MoDOT is aware of new Virginia sneezeweed sites that may have been discovered. MoDOT has also contacted MDC and the Service (Missouri Field Office) to assist with preconstruction surveys for Virginia sneezeweed in locations where the plant is not known but populations are nearby (Rimer 2019a, pers. comm.). If the Federal listing status for Virginia sneezeweed were to change, the species would retain an S3 NatureServe ranking in Missouri, indicating a species that is at moderate risk of extirpation in Missouri due to a fairly restricted

range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors (NatureServe 2020, unpaginated). MoDOT will continue to coordinate these efforts that benefit Virginia sneezeweed since it will remain a species of conservation concern in Missouri (Briggler 2019, pers. comm.).

The remaining 55 EOs (72 percent of all EOs) are on privately owned lands (44 in Missouri and 11 in Virginia). Their status in regard to threats is discussed below under **Summary of Biological Status and Threats**. Thus, while the numerical threshold set out in this delisting criterion has not been met as it was originally worded, the intention was to increase protected occurrences of the species in order to increase species' viability. There are more than three times the original number of populations now known to exist across three States. Of those populations, 20 percent are permanently protected, with another 8 percent likely to benefit from ongoing structural protections. The overall increase in both number of protected EOs and the overall range increases both redundancy and representation, therefore increasing the species' viability. Therefore, the original intent of this criterion has been fulfilled.

Delisting Criterion 2: Monitoring over 15 years indicates that populations in the 20 sites have long-term viability.

The purpose of this criterion was to confirm that an adequate number of populations (redundancy) were both protected and sufficiently resilient over a reasonable duration to reflect long-term viability of the species. As noted above, there are now more than three times the number of populations known at the time of listing, and 20 percent of these populations are protected. Regarding resiliency, regular monitoring of EOs over 15 years has not occurred at the majority of sites; 12 EOs in Virginia have been observed multiple times over at least 15 years. No EOs in Missouri have been observed multiple times over 15 years, but 19 EOs have been observed multiple times over at least 10 years, including all 6 that occur on Federal or State lands. Overall, a total of 12 EOs (16 percent of all EOs) have been observed multiple times at varying intervals over 15 years (all in Virginia), and 34 EOs (45 percent of all EOs) have been

observed multiple times over at least 10 years, including 11 of the 15 EOs that occur on protected lands across the species' range. The EO in Indiana was just discovered in 2018, making 10 to 15 years of monitoring data for this EO unattainable.

In addition, the draft recovery plan (Service 2000, pp. 23, 27–28) did not define “long-term viability,” and several of the recovery tasks involve determining viability for the species, none of which have been accomplished. The figures quantifying observations of EOs above reflect presence over time but not necessarily condition of the EO, which also is relevant to resiliency and, therefore, viability. However, for each observation of a Virginia sneezeweed population, a surveyor assigned an EO rank based on observations beyond population size, including habitat conditions at the site at the time of the survey, conditions over time since its last observation (when applicable), and probability of persistence. EO rankings present a challenge in terms of interpreting viability because they are based on a snapshot in time of the condition of each EO at its most recent observation. However, given the limited available information for Virginia sneezeweed, we consider the EO rank to be the most meaningful way to describe a population's status, as it requires an in-person observation and combines multiple components of a population's condition into a single metric.

We evaluated each population's resiliency by using the most recent EO rank (see table 1, below). We considered populations with EO ranks of A, AB, or AC “excellent;” populations with EO ranks of B, BC, or BD “good;” populations with EO ranks of C or CD “fair;” and populations with EO ranks of D or E “poor.” Because the sample size for EOs observed over 15 years is small and skewed with only Virginia populations, we looked at all 34 EOs observed over at least 10 years. Based on EO ranks, 8 have excellent resiliency, 6 have good resiliency, 15 have fair resiliency, and 5 have poor resiliency. Therefore, while 20 populations have not been monitored for 15 years as specified in the recovery criterion, there has been long-term monitoring over at least 10 years for 34 sites. Eighty-five percent of these sites have fair to excellent resiliency, which increases the species' overall viability. Of note, 11 of the 15

populations on protected lands have had multiple visits over at least 10 years, and all 11 have an EO rank of fair to excellent. Given this, we conclude the original intent of this recovery criterion is met.

Table 1. Virginia sneezeweed EO protected status and rank summarized by State.

State	Total # of EOs	# EOs Permanently Protected	EO Rank			
			Excellent (# protected)	Good (# protected)	Fair (# protected)	Poor (# protected)
Virginia	19	8	5 (5)	3 (0)	6 (1)	5 (2)
Missouri	56	6	6 (4)	18 (1)	24 (1)	8 (0)
Indiana	1	1	--	1 (1)	--	--
Total	76	15	11 (9)	22 (2)	30 (2)	13 (2)

Delisting Criterion 3: Life-history and ecological requirements are understood sufficiently to allow for effective protection, monitoring, and, as needed, management.

This criterion has been met. Research on the Virginia populations (Knox 1997, entire; Knox et al. 1999, entire) and Missouri populations (Rimer and Summers 2006, entire) has expanded knowledge of the life-history and ecological requirements of Virginia sneezeweed, allowing for effective protection, monitoring, and management.

Delisting Criterion 4: Seeds representing the range of genetic diversity in H. virginicum are placed in long-term storage to provide a source of genetic material in the event of in situ extinction.

Since this delisting criterion was drafted, seeds have been acquired and placed in long-term storage from six EOs from four counties in Missouri, but no seeds have been collected and stored from Virginia (Townsend 2019, pers. comm.). Information on the high levels of genetic variation at the species level and high population structure indicates that to represent the entire range of genetic diversity (i.e., representation), seeds would likely need to be collected and placed in long-term storage from Virginia EOs and additional Missouri EOs to satisfy this criterion (Knox et al. 2016, entire; Service 2020, p. 31). Furthermore, if ongoing research indicates the Indiana population is naturally occurring and distinct from the other regions, seeds

will need to be collected and put into long-term storage from this region to capture a fuller range of the species' genetic diversity and to meet this criterion (Williams et al. 2021, entire; Service 2020, p. 31).

Given the number of EOs now found in Virginia, Missouri, and Indiana, the species has more representation (adaptive capacity) than previously thought; thus, preservation of a wider range of genetic material from multiple regions would be necessary to meet this criterion. While this criterion has not been met, the intent of the criterion was to preserve genetic material given in situ extinction risk, which is now considerably lower given the overall increase in species' viability since the time of listing (see *Viability Analysis*, below).

Delisting Criterion 5: The population and habitat of the Missouri Helenium sp., if it is determined to be H. virginicum, are permanently protected and seeds placed in long-term storage.

The original intent of this criterion has been met. Importantly, this criterion was developed prior to the discovery of the additional 55 EOs in Missouri. This information renders this criterion duplicative of delisting criteria (1) and (4) above. The referenced Missouri population was determined to be *H. virginicum* (Simurda and Knox 2000, entire; Simurda et al. 2005, entire). Seeds from this site were collected in the early 2000s and have been placed in long-term storage (Rimer 2018, pers. comm.). This site is owned by the Howell County Road Commission and is not permanently protected. It is a managed site, and the responsible agency works with MDC and the Service to minimize impacts to Virginia sneezeweed from mowing, spraying, and other activities. It is unclear whether this coordination would continue if Virginia sneezeweed were no longer a federally listed species; however, this is 1 of 56 EOs in Missouri. In terms of preserving genetic material and habitat (representation) in Missouri, the six EOs in Missouri on protected State lands and the collection of seeds for long-term storage from six EOs in Missouri meet this criterion's original intent.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations set forth the procedures for determining whether a species is an endangered species or a threatened species, issuing protective regulations for threatened species, and designating critical habitat for endangered and threatened species.

The Act defines an “endangered species” as a species that is in danger of extinction throughout all or a significant portion of its range, and a “threatened species” as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

- (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) Overutilization for commercial, recreational, scientific, or educational purposes;
- (C) Disease or predation;
- (D) The inadequacy of existing regulatory mechanisms; or
- (E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species’ continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects. The determination to delist a species must be based on an analysis of the same five factors.

We use the term “threat” to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The

term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a “threatened species.” In determining whether a species meets either definition, we must evaluate all identified threats by considering the species’ expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term “foreseeable future,” which appears in the statutory definition of “threatened species.” Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis which is further described in the 2009 Memorandum Opinion on the foreseeable future from the Department of the Interior, Office of the Solicitor (M–37021, January 16, 2009; “M- Opinion,” available online at <https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37021.pdf>). The foreseeable future extends as far into the future as the U.S. Fish and Wildlife Service and National Marine Fisheries Service (hereafter, the Services) can make reasonably reliable predictions about the threats to the species and the species’ responses to those threats. We need not identify the foreseeable future in terms of a specific period of time. We will describe the foreseeable future on a case-by-case basis, using the best available data and taking into account considerations such as the species’ life-history characteristics, threat-projection timeframes, and

environmental variability. In other words, the foreseeable future is the period of time over which we can make reasonably reliable predictions. “Reliable” does not mean “certain”; it means sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the Act.

Analytical Framework

To assess Virginia sneezeweed’s viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency is the ability of the species to withstand environmental and demographic stochasticity (e.g., wet or dry, warm or cold years); redundancy is the ability of the species to withstand catastrophic events (e.g., droughts, large pollution events), and representation is the ability of the species to adapt to both near-term and long-term changes in the physical and biological environment (e.g., climate conditions, pathogens). In general, species viability will increase with increases in resiliency, redundancy, and representation (Smith et al. 2018, p. 306). Using these principles, we identified the species’ ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species’ viability.

Summary of Biological Status and Threats

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species’ current and future condition, in order to assess the species’ overall viability and the risks to that viability. In addition, the 5-year review (Service 2020, entire) documents our comprehensive biological status review for the species, including an assessment of the potential threats to the species.

The following is a summary of this status review and the best available information gathered since that time that have informed this decision.

At the time of listing, habitat modification and associated hydrological disruption (through residential development, incompatible agricultural practices, filling and ditching of

wetland habitats, and groundwater withdrawal) were identified as the primary threats to Virginia sneezeweed (63 FR 59239; November 3, 1998). Restricted range and small number of populations (Factor E), invasive species (Factor E), climate change (Factor E), and the inadequacy of State or Federal mechanisms to protect Virginia sneezeweed habitat at that time (Factor D) were also discussed as factors contributing to the species' threatened status.

Since the publication of the final listing rule (63 FR 59239; November 3, 1998), these threats and/or their known impact on the species have been significantly reduced. The previously perceived risk of extinction has also been reduced due to an increase in both the known geographic range and number of Virginia sneezeweed populations. The following analysis evaluates the previously identified threats, any other threats currently facing the species, as well as threats that are reasonably likely to affect the species within the foreseeable future if the species is delisted and the Act's protections are removed.

To establish the foreseeable future for Virginia sneezeweed, we evaluated trends from historical data on distribution and abundance, ongoing conservation efforts, factors currently affecting the species, and predictions of future climate change and land development. Virginia sneezeweed was listed as threatened under the Act in 1998 (63 FR 59239; November 3, 1998), and the species has been monitored for at least 20 years (with some populations having been monitored before listing). These historical data provide insight into Virginia sneezeweed's exposure and response to potential threats under varying conditions. We used the U.S. Geological Survey (USGS) Forecasting Scenarios of Land-use Change (FORE-SCE) land cover model to evaluate land use changes to 2100 in the counties where Virginia sneezeweed occurs. We also used region-specific downscaled climate models for both the mid-Atlantic highlands region (which includes Virginia sneezeweed's Virginia range) and the Missouri Ozarks to evaluate future climate change impacts to hydrology throughout the species' range to 2100. Given our understanding of the best available data, for the purposes of this proposed rule, we consider the foreseeable future for Virginia sneezeweed to extend to the year 2100.

Habitat Modifications and Hydrological Disruption

At the time of listing, the principal threats impacting Virginia sneezeweed were identified as habitat modification and the associated direct and indirect disruption of hydrology. Specific sources of threats identified included residential development, incompatible agricultural practices, filling and ditching of wetland habitat, and groundwater withdrawal.

Among the sites that have been visited multiple times since the species was listed, six sites in Virginia representing four EOs were documented in 2006–2008 to have habitat degradation in the form of hydrological modification from deepening portions of ponds or digging drainage ditches; at one of these sites, a large pile of soil introduced sediment into the habitat. In addition, decreased cattle grazing and mowing may have played a role in declines at some of these sites, most likely because those activities typically reduce competing vegetation (Van Alstine 2007, pp. 5–12; 2009, pp. 6–11; Service 2020, pp. 10, 17, 19). There is no evidence of hydrological impacts to sites in Virginia from other sources or activities. Despite the identified habitat degradation, these sites were noted at the time as still supporting several hundred to 10,000 plants per site. However, those figures represented significant declines in abundance when compared to estimates from the 1980s despite shorter term increases in abundance that had been observed at the sites in the intervening period.

According to the VDCR's EO records, three of those six sites have been visited since 2008. One site record indicates an incidental roadside observation of 200+ flowering plants in 2017, but no formal survey was conducted. Another site record indicates a few large rosettes observed in a culvert but generally dry habitat conditions in 2010. The third site was observed in 2010, when thousands of robust plants were observed, and again in 2017 during a pollinator survey, when observers did not survey specifically for Virginia sneezeweed but estimated 500 to 600 flower heads in early August. No additional comments were recorded in the EO records regarding any changes to the habitat quantity or quality at these three sites. While the abundance of aboveground plants continues to fluctuate as described previously, these more recent

observations indicate that populations on at least three of the six sites considered to have suffered degradation have continued to persist and their EO rank has not changed over the course of these additional observations.

In addition to hydrological modification, habitat degradation has occurred through unauthorized all-terrain vehicle (ATV) traffic at two EOs on land owned by the USFS and at pond habitat on private lands in Virginia. The use of ATVs through ponds or on pond margins can damage or destroy aboveground plants, disturb the seed bank, and create pooling or other hydrologic changes in the microenvironment due to tire ruts. At one USFS site, tire ruts, tree cutting, and dump sites were documented. The USFS is actively coordinating with their law enforcement division on mitigation efforts, and citations have been issued to several individuals. Given these efforts, which are unrelated to the status of Virginia sneezeweed under the Act, and the small number of EOs currently affected throughout the species' range, ATV and other vehicle traffic is not considered to be a significant influence on the species' overall viability, and therefore not a threat impacting the status of the species. We lack direct observational data for many of the remaining EOs in Virginia; however, land use within Virginia sneezeweed's range in the State has been reasonably stable. Clearing land for pasture has also been observed as a land use change on private property within the species' range. This type of alteration may be beneficial for Virginia sneezeweed by eliminating encroaching vegetation that provides shade, leaving the species with its preferred open/unshaded habitat.

There are limited direct observational data for many EOs in Missouri; however, core areas where EOs exist on private lands do not lend themselves to hydrological alteration, as the soils are not suitable for row crop agriculture that often involves digging ditches for proper drainage. There have been a few observations of farmers modifying ponds at Missouri sites, but disturbed Virginia sneezeweed populations have been documented persisting or reemerging from the seed bank within 1 to 2 years post-disturbance at those sites (Rimer 2019a, pers. comm.).

There is no evidence of documented habitat alteration beyond the pond (hydrological) changes noted at observed sites in Missouri.

In Indiana, the single EO is on a 127-acre parcel with 42 acres designated as a State Nature Preserve and 85 acres under a conservation easement governed by the Indiana Department of Natural Resources (Stolz 2019, pers. comm.). Given that these protections were in place prior to the recent discovery of this population, it is unlikely that habitat modifications are a recent or current threat for this population.

There are currently protections or site-specific management activities in place at 21 sites across Virginia sneezeweed's range that benefit more than a quarter of known populations and are expected to remain in place post-delisting. However, the majority of Virginia sneezeweed populations occur on private lands. The continued observation of Virginia sneezeweed at most known sites with multiple visits over time suggests individual EOs have enough resiliency (large enough seed banks) for plants to reestablish when habitat conditions become favorable after periods of unsuitability and can withstand and even benefit from some level of anthropogenic habitat disturbance. Given this resiliency and the small number of EOs that have been observed to be impacted by hydrological disturbance due to habitat modification, the best available information does not reflect that habitat modification is currently affecting the species' viability.

Virginia sneezeweed populations on private lands may be subject to land use changes; however, according to projections of future urbanization and the best available information on agricultural practices, we do not expect significant increases in the percent of land area that becomes developed in counties where Virginia sneezeweed occurs (Nakicenovic et al. 2000, entire; Sohl et al. 2014, entire; Sohl et al. 2018, entire). Some small increases are projected for agricultural areas in counties of occurrence, primarily hay/pasture lands; however, managed and scheduled pasturing (mowing, cattle grazing, and spraying) appears to be a land use compatible with the maintenance of Virginia sneezeweed populations as it reduced competition with invasive plant species (Van Alstine 2009, pp. iv–v, 6–11, 20). Thus, we do not think

hydrological disruption, due to land use or climate change (see *Effects of Climate Change*, below), is likely to significantly impact the species' viability within the foreseeable future.

We expect the threat of unauthorized ATV or other vehicle use to remain the same or decrease in the future due to active management efforts by the USFS, as described above.

Invasive Species

Although invasive species were listed as a potential threat to Virginia sneezeweed at the time of listing in 1998, invasive species are not currently known to be a threat at any of the EOs in Virginia or Indiana (Townsend 2021, pers. comm.). In Missouri, encroaching invasive species like spotted knapweed (*Centaurea stoebe*) have been identified as a threat for several of the six EOs on State road rights-of-way. Spotted knapweed is a biennial or short-lived perennial that forms a deep taproot, easily establishes in disturbed areas, and produces a large quantity of seed. Once established, spotted knapweed becomes a solid stand that can outcompete native species, including Virginia sneezeweed. Spotted knapweed has been spread along highway and road corridors by mowing equipment. Eleven percent of Missouri EOs (which is 8 percent of the total EOs) occur along roadways and are exposed to this threat. The routine mowing and spraying along roadways that MoDOT carries out in coordination with MDC to address invasive species minimizes impacts to Virginia sneezeweed.

In Virginia, the potential for invasives to become a threat in the future is linked to changes in land use that may introduce or encourage the spread of invasives (e.g., conversion of sinkhole pond habitat to pastureland could introduce competition from pasture grasses or other agricultural invasives) or encourage pesticide use (Townsend 2021, pers. comm.). Localized land use changes that may affect individual populations are difficult to project into the future on the private lands where more than half of Virginia sneezeweed populations in Virginia occur. However, as discussed above, wider-scale land use changes in Virginia are projected to involve small increases in agricultural areas and uses, which the best available information suggests is

compatible with Virginia sneezeweed and tends to decrease, rather than increase, competition from invasive plant species.

Although current roadside maintenance efforts in Missouri to mow and spray spotted knapweed and other encroaching invasive species would no longer be required of MoDOT if Virginia sneezeweed were no longer federally listed, MDC is confident MoDOT will continue to coordinate these efforts that benefit Virginia sneezeweed because it will remain a species of conservation concern in Missouri (Briggler 2019, pers. comm.). Therefore, we expect this threat to the six Missouri EOs to stay the same or decrease in the future due to these active management efforts. We thus conclude that the best available data do not indicate that encroaching invasive species will threaten the viability of Virginia sneezeweed into the foreseeable future.

Effects of Climate Change

The effects of climate change could result in significant changes in hydrology in Virginia sneezeweed's habitat. The rate, spatial distribution, direction, and magnitude of changes, as well as the buffering effects of habitat heterogeneity and the adaptive capacity of the species, are sources of uncertainty in assessing Virginia sneezeweed's response to the effects of climate change. Best scientific and commercial data available indicate droughts and flooding associated with rapidly changing climate within the range of Virginia sneezeweed have the potential to negatively influence populations because the timing and magnitude of inundation play a large role in reproduction and survival. Wetlands that depend primarily on precipitation for their water supply are more vulnerable to changes in climate than wetlands that depend on regional groundwater flow systems (Winter 2000, p. 305) and Virginia sneezeweed occurs in both types of wetlands.

In modeling the most likely future scenario (Service 2020, pp. 27–29), we assume that EOs with current viability of fair or better have sufficient resiliency to continue to exist under future predicted climatic changes while EOs with a current ranking of poor are likely to be

extirpated if further stressed by predicted changes in climatic patterns that may result in increased floods and drought. Even with the uncertainty associated with predicting climate effects, the best available projections do not indicate that conditions will become so unfavorable within the species' range that Virginia sneezeweed populations could not continue to occupy most current habitats or establish new populations where appropriate conditions exist. Thus, we are taking a conservative approach by assuming EOs that currently have poor resiliency will not be able to tolerate the additional stress imposed by climatic changes to their habitats and would be extirpated. That means 5 EOs in Virginia (26 percent of Virginia populations) and 8 EOs in Missouri (14 percent of Missouri populations) are likely to be extirpated, leaving 63 EOs (83 percent of current extant populations) remaining across three States and four physiographic provinces. At the population level, resiliency is likely to decrease somewhat for some populations in the face of climatic changes causing increased flooding and drought (and, therefore, causing increased stress on the species where it occurs). Redundancy overall will be reduced due to the loss of 13 EOs. Because each population is likely to be genetically distinct based on the best available information, the loss of 17 percent of current extant populations is likely to reduce genetic diversity and lower representation. Despite these losses, the species will continue to exist in a range of habitat types and across all four physiographic provinces throughout its range. Given these data and the current known distribution of populations, we conclude that the effects of climate change will not threaten the viability of the species within the foreseeable future.

Restricted Range and Small Number of Populations

The final listing rule (63 FR 59239; November 3, 1998) noted that threats to Virginia sneezeweed were compounded by the species' restricted range and the small number of populations. At the time of listing, the species was known to occur in 25 EOs in two counties in Virginia. The species has now been found in 76 EOs across 12 counties in three States and four physiographic provinces. Thus, because of this significant expansion in both the known range

and number of populations, redundancy for the species is greater than recognized at the time of listing (i.e., the chance of stochastic or catastrophic events extirpating a significant number of EOs is lower), and we no longer consider the species' range or number of populations to be a compounding threat now or within the foreseeable future.

Conservation Efforts and Regulatory Mechanisms

There are numerous conservation efforts in progress or completed that benefit Virginia sneezeweed viability, including ongoing surveys of known occupied and suitable habitat in Missouri; biological, genetic, and ecological research that have expanded our knowledge of Virginia sneezeweed; successful reintroduction and seed banking programs in Missouri; and implementation of roadside maintenance best management practices that avoid and minimize impacts to roadside Virginia sneezeweed EOs. The designation of two Natural Area Preserves in Virginia and active management on other public lands by MDC, VDCR-DNH, and USFS would also continue to benefit a total of 15 EOs following removal from protections of the Act.

Numerous State regulations in Virginia, Missouri, and Indiana benefit Virginia sneezeweed. The species is State-listed as endangered in Virginia, Missouri, and Indiana; however, most of the documented EOs are located on private land, so there is limited protection under State endangered species laws.

In Virginia, the species is listed as endangered under the Virginia Endangered Plant and Insect Species Act (see title 3.2, chapter 10, sections 3.2-1000 et seq. of the Code of Virginia); receives habitat protections via the "no net loss" wetland policy established under the Virginia Water Protection permit program (section 62.1-44.15:20 of the Code of Virginia); and is further protected via the permit program through regulation of fill for development, water resource projects, infrastructure development, and mining projects. The program regulates all State waters and issues permits in parallel with U.S. Army Corps of Engineers (Corps) permits issued under section 404 of the Clean Water Act (33 U.S.C. 1251 et seq.); these Corps permits are referred to below as "Clean Water Act 404" permits. A State/Corps joint permit is needed to alter the

physical, chemical, or biological properties of regulated State waters and make them detrimental for various uses; excavate in wetlands; or conduct activities in a wetland: that cause significant alteration or degradation of existing wetland acreage or functions. The Virginia Water Protection permit program may also provide some protection for Virginia sneezeweed habitat within the area of influence of proposed development projects in Virginia that require Clean Water Act 404 permits, regardless of the species' Federal listing status under the Act.

Virginia sneezeweed is listed as endangered by the State of Missouri; State listing occurs automatically in the State when a species becomes federally listed under the Act (see Revised Statutes of Missouri at section 252.240).

In Indiana, the species is currently listed as endangered by the State (see title 14, article 22, chapter 34 of the Indiana Code (IC 14–22–34)). There is no direct protection for State-listed plant species of conservation concern in Indiana; however, indirect protection is afforded to listed plants via other Indiana State laws and acts. The Virginia sneezeweed EO in Indiana is located on a conservation easement granted by the Town of Fishers to the Indiana Department of Natural Resources, perpetually preserving the property in its predominantly natural condition. Furthermore, the property is located within the Ritchey Woods Nature Preserve, which implements its own restrictions (details of both the easement and further restrictions are provided in the 5-year review; see Service 2020, pp. 21–22).

If the protections of the Act were to be removed in the future, Virginia sneezeweed is likely to remain State-listed in Virginia (Townsend 2021, pers. comm.). In the event the species is also removed from the State list, a survey and other recommendations may be suggested but would not be required of the applicant by VDEQ (Hypes 2019, pers. comm.). In Missouri, if protections of the Act were to be removed in the future, Virginia sneezeweed also would be removed from the State list unless it is independently designated as rare or endangered by the state. However, Virginia sneezeweed would remain ranked in Missouri as an S3 species (“Vulnerable in the [S]tate due to a restricted range, relatively few populations or occurrences,

recent and widespread declines, or other factors making it vulnerable to extirpation”; MDC 2023, p. 8).

Synergistic Effects

Many of the potential stressors discussed in this analysis could work in concert with each other and result in a cumulative adverse effect to Virginia sneezeweed (i.e., one stressor may make the species more vulnerable to the effects of other threats). For example, stressors related to habitat modification/degradation that individually do not rise to the level of a threat could, in combination with a restricted range and small number of populations, present a potential concern. However, most of the potential stressors that were originally believed to put Virginia sneezeweed in danger of extinction either have not materialized to the extent originally anticipated at the time of listing or are adequately managed as described in this document. Synergistic interactions are possible between the effects of climate change and effects of other threats, such as nonnative plant invasion. Higher temperatures and longer growing seasons could also result in a higher prevalence of invasive plants; however, the evidence that Virginia sneezeweed outcompetes invasive species when disturbed (e.g., by mowing, grazing, and chemical spraying) suggests stressful conditions associated with fluctuating hydrology and soil conditions (high levels of aluminum and low pH) could continue to give Virginia sneezeweed a competitive advantage over other plants. Furthermore, the increases documented in the number, distribution, and size of many populations since the species was listed in 1998 alleviate concerns of potential compounding effects due to small range and few populations and do not indicate that cumulative effects of various activities and stressors are affecting the viability of the species.

Viability Analysis

Using the framework of resiliency, representation, and redundancy (discussed above under **Analytical Framework**), we can evaluate the current biological status of Virginia sneezeweed. Since the species’ listing in 1998, work by partner agencies has led to significant improvements in our understanding of the biology and life history of the species, the discovery

of 60 new occupied sites, and actions (e.g., successful reintroductions, seed banking, management of invasive species, habitat protection) to mitigate threats to many populations across the species' range. In particular, the discovery of 60 new occurrences in different regions significantly expands the geographic range and increases redundancy and representation for the species.

Notwithstanding some indications that up to six sites representing four EOs in Virginia show substantial reductions in abundance when compared to several decades ago, the species' continued existence at monitored sites despite large fluctuations in abundance over time and the broader range of habitats that it now is known to occupy suggest that resiliency overall is reasonably high. Across the range, 43 percent of EOs are classified as having excellent to good resiliency, 40 percent have fair resiliency, and 17 percent have poor resiliency.

Based on the best available data, habitat alterations associated with climate change have the most potential to adversely affect Virginia sneezeweed populations, although given the uncertainty (described above), the weight of evidence does not indicate any reliable amount of likely adverse effects. Other threats do not appear to be substantial or immediate at the species level. Because there is high genetic diversity at the species level, maintaining robust representation for Virginia sneezeweed will require a sufficient number of genetically distinct EOs across the species' range. After examining the species' most likely future condition, it appears that changes in hydrology due to climate change could result in the extirpation of up to 13 EOs or 17 percent of extant populations. The EOs most vulnerable to extirpation have the smallest populations, and records show that populations with multiple observations have continued to exist at low population levels since they were originally discovered. While the loss of 17 percent of populations would have a proportional effect on genetic diversity given that the populations are genetically distinct from each other, a much smaller percentage of the actual abundance would be lost. Extirpated populations would be spread through the species' range and would not result in any significant contraction of the overall range—the species would still occur

in three States and all four physiographic provinces throughout its range. In our future scenario, the remaining 61 EOs would maintain 83 percent of the current genetic diversity, more than 83 percent of the current abundance, and the vast majority of the current overall spatial distribution.

Overall, we have a better understanding of extinction risk for Virginia sneezeweed as a result of years of survey efforts to locate additional populations. Virginia sneezeweed's risk of extinction is much lower now than when it was listed, largely due to our increased understanding of previously unknown populations, in combination with seed banking and propagation and recovery efforts. Considering our modeled "most likely" future scenario in the 5-year review for Virginia sneezeweed (Service 2020, entire), it is apparent that the risk that threats would manifest in such a way as to cause the species to be or become in danger of extinction now or within the foreseeable future is very low.

Determination of Virginia Sneezeweed's Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an "endangered species" as a species that is in danger of extinction throughout all or a significant portion of its range, and a "threatened species" as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of an endangered species or a threatened species because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

Status Throughout All of Its Range

After evaluating threats to the species and assessing the cumulative effect of the threats

under the Act's section 4(a)(1) factors, we have found that significant threats to Virginia sneezeweed at the time of listing (63 FR 59239: November 3, 1998) have been eliminated or materially reduced, no significant new threats have emerged, and viability has increased (see *Viability Analysis*, above).

The primary threats identified for the species at the time of listing in 1998 were habitat modification and the associated disruptions of hydrology (Factor A) through residential development, incompatible agricultural practices, filling and ditching of wetland habitats, and groundwater withdrawal. While some habitats occupied by Virginia sneezeweed are exposed to these threats, some are protected from these threats, and many new populations discovered since listing are not likely to be exposed to these threats. Since listing, Virginia sneezeweed is known to occur in 10 additional counties in 2 additional States. The discovery of these additional populations throughout an expanded range and the continued existence of Virginia sneezeweed EOs indicates that the negative effects from threats identified at listing in 1998 have not materialized.

The final listing rule (63 FR 59239; November 3, 1998) also discussed restricted range and small number of populations (Factor E), invasion of exotic species (Factor E), climate change (Factor E), and inadequate regulatory mechanisms for preventing habitat destruction (Factor D) as factors contributing to the species' threatened status. However, our review of the status of and listing factors for Virginia sneezeweed indicates: (1) a large increase in both geographic range and number of occurrences across the range due to new population discoveries; (2) resiliency to existing and potential threats; (3) the protection of 15 extant occurrences located on Federal and State conservation lands and 6 extant occurrences on State and County highway rights-of-way that through regulations or established management practices prevent habitat destruction or removal of plants; and (4) the implementation of conservation efforts that benefit the species. Therefore, we determine that these factors no longer present a significant threat to the species. We further determine that there is no evidence that overutilization for commercial,

recreational, scientific, or educational purposes (Factor B) or disease or predation (Factor C) are current threats to Virginia sneezeweed. Climate change and potential land use changes affecting hydrology in Virginia sneezeweed habitats, as discussed above, are expected across the species' range, and while the magnitude and spatial/temporal distribution of these influences are highly uncertain, they are not expected to put the species at risk of extinction within the foreseeable future. Thus, after assessing the best available scientific information, we conclude that Virginia sneezeweed is not in danger of extinction now or likely to become so within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range. Having determined that Virginia sneezeweed is not in danger of extinction or likely to become so within the foreseeable future throughout all of its range, we now consider whether it may be in danger of extinction (i.e., endangered) or likely to become so within the foreseeable future (i.e., threatened) in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant; and (2) the species is in danger of extinction now or likely to become so within the foreseeable future in that portion. Depending on the case, it might be more efficient for us to address the “significance” question or the “status” question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

In undertaking this analysis for Virginia sneezeweed, we chose to evaluate the status question first. We began by identifying portions of the range where the biological status of the species may be different from its biological status elsewhere in its range. For this purpose, we considered information pertaining to the geographic distribution of (a) individuals of the species,

(b) the threats that the species faces, and (c) the resiliency condition of populations.

We evaluated the range of Virginia sneezeweed to determine if the species is in danger of extinction or likely to become so within the foreseeable future in any portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. We focused our analysis on portions of the species' range that may meet the Act's definition of an endangered species or a threatened species. For Virginia sneezeweed, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species' range than in other portions such that the species is in danger of extinction now or likely to become so within the foreseeable future in that portion.

We examined the following threats and cumulative impacts of these threats: (1) habitat modifications and associated hydrologic disruption; (2) invasive species; (3) effects of climate change; and (4) conservation efforts and regulatory mechanisms. As stated above under **Summary of Biological Status and Threats**, when this species was listed in 1998, habitat modifications and associated hydrological disruption through residential development, incompatible agricultural practices, filling and ditching of wetland habitats, and groundwater withdrawal were identified as the primary threats to Virginia sneezeweed. However, since listing, the best available scientific information reflects only a few isolated instances of hydrological alteration from deepening ponds and drainage ditches. Importantly, at each impacted site the species persisted despite the disruption. Accordingly, this anticipated threat has not materialized in any portion of the range, and we therefore determine that the threat of habitat modification and hydrologic disruption, even in the absence of Federal listing, does not rise to a level that threatens the species in any biologically meaningful portion of its range. Similarly, the remaining threats to the species have been significantly reduced so that they do not threaten the species in any biologically meaningful portion of its range.

Invasive species are not an active threat in Virginia sneezeweed habitat in Virginia or Indiana, and the best available scientific information does not indicate the threat from invasive

species will materially increase in the foreseeable future in these portions of the species' range. In Missouri, encroaching invasive species like spotted knapweed have been identified in 6 of the 56 EOs on State rights-of-way. Routine mowing and spraying along roadways that MoDOT carries out in coordination with MDC is expected to continue to benefit Virginia sneezeweed, indicating that the threat to the six Missouri EOs will stay the same or decrease in this portion of the species' range.

The magnitude and spatial/temporal distribution of climate change impacts on Virginia sneezeweed and its habitat are highly uncertain; however, they are not expected to put the species at risk of extinction within the foreseeable future. Resilience is likely to decrease for some individual populations because of climatic changes that cause increased flooding and drought. In modeling the most likely future scenario (Service 2020, pp. 27–29), we assume that EOs with current viability of fair or better have sufficient resiliency to continue to exist under future predicted climatic changes while EOs with a current resiliency ranking of poor are likely to be extirpated if further stressed by predicted changes in climatic patterns that may result in increased floods/drought.

Even with the uncertainty associated with predicting climate effects, the best available projections indicate that conditions will not become so unfavorable within the species' range that Virginia sneezeweed populations could not continue to occupy most current habitats or establish new populations where appropriate conditions exist. Thus, we consider it a conservative approach to assume EOs that currently have poor resiliency will not be able to tolerate the additional stress imposed by climatic changes to their habitats and will be extirpated. Under this assumption, 5 EOs in Virginia (26 percent of Virginia populations) and 8 EOs in Missouri (14 percent of Missouri populations) are likely to be extirpated, leaving 14 EOs in Virginia and 48 EOs in Missouri. The species would still occur across all four physiographic provinces throughout its range: the Blue Ridge and Ridge and Valley in Virginia, the Plains in Indiana, and the Ozark Plateau in Missouri. The single population in Indiana is expected to remain with good

resiliency. The populations in Missouri are expected to reflect substantial resiliency and redundancy with a high number and percentage of all populations remaining in this portion of the range (86 percent of Missouri populations). Although a slightly greater percentage of populations extant in Virginia are likely to be extirpated, the species nevertheless would remain resilient in that portion of its range by retaining 74 percent of current extant Virginia populations. There are fewer known populations overall within Virginia, and the 14 remaining populations would reflect some reduction in redundancy within that portion of the range; however, because the EOs projected to be extirpated have smaller populations generally, the remaining populations would retain a greater percent of the species' abundance in Virginia and the impact to the portion of the range from reduced redundancy is likely limited.

In further addressing the status question, we also consider that the populations that may be extirpated within the foreseeable future due to current poor viability could individually or collectively be considered to have a different status from the remaining populations. However, when addressing the significance question, these populations do not constitute a significant portion of the species' range. There is no evidence to indicate that populations projected to potentially be extirpated within the foreseeable future are any more biologically meaningful than those expected to remain extant. No populations (individually or collectively) occur in unique habitats that would otherwise make those populations biologically meaningful. In addition, the more populations there are for a given species, the lower the proportion that each one contributes individually toward viability. Those populations of Virginia sneezeweed currently in poor condition are contributing less to resilience at the species level than their healthier counterparts. Collectively, they do not constitute a biologically meaningful portion of the species' range because populations with EO ranks of poor are not concentrated in any given geographic area, and they make up a small proportion of the overall range and total abundance.

A number of regulatory mechanisms exist and a number of conservation efforts that benefit Virginia sneezeweed have occurred since the species' Federal listing in 1998, and they

are expected to continue for the foreseeable future even in the absence of Federal listing. The species is State-listed as endangered in Virginia, Missouri, and Indiana; however, most of the documented EOs are located on private land, so there is limited protection under State endangered species laws. Virginia's Virginia Water Protection permit program provides some additional protection for Virginia sneezeweed habitat in areas where development projects are required to obtain Clean Water Act section 404 permits. In Indiana, the single EO has multiple protections in place. Although the protections afforded the species in these different portions of its range vary, there is no evidence to suggest the differences among the conservation measures and regulatory mechanisms contribute to a different biological status of the species in any portion of its range.

As described above, while there are populations with lower current and future viability than others, these populations do not individually or collectively occur in unique habitats, nor are they concentrated in any specific area. Cumulatively, they make up a small proportion of the overall range and total abundance. We therefore found no biologically meaningful portion of the Virginia sneezeweed's range exists where the condition of the species differs from its condition elsewhere in its range such that the status of the species in that portion differs from its status in any other portion of the species' range.

Therefore, we find that the species is not in danger of extinction now or likely to become so within the foreseeable future in any significant portion of its range. This does not conflict with the courts' holdings in *Desert Survivors v. U.S. Department of the Interior*, 321 F. Supp. 3d 1011, 1070-74 (N.D. Cal. 2018) and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not apply the aspects of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578; July 1, 2014), including the definition of "significant" that those court decisions held to be invalid.

Determination of Status

Based on the best scientific and commercial data available, we determine that Virginia sneezeweed does not meet the definition of an endangered species or a threatened species in accordance with sections 3(6) and 3(20) of the Act. In accordance with our regulations currently in effect at 50 CFR 424.11(e)(2), Virginia sneezeweed has recovered to the point at which it no longer meets the definition of an endangered species or a threatened species. Therefore, we propose to remove Virginia sneezeweed from the Federal List of Endangered and Threatened Plants.

Effects of This Rule

This proposal, if made final, would revise 50 CFR 17.12(h) by removing Virginia sneezeweed from the Federal List of Endangered and Threatened Plants. The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, would no longer apply to this species. Federal agencies would no longer be required to consult with the Service under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect Virginia sneezeweed. There is no critical habitat designated for this species, so there would be no effect to 50 CFR 17.96.

Post-Delisting Monitoring

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

We will coordinate with other Federal agencies, State resource agencies, interested scientific organizations, and others as appropriate to develop and implement an effective PDM plan for Virginia sneezeweed. The PDM plan will build upon current research and effective management practices that have improved the status of the species since listing. Ensuring continued implementation of proven management strategies that have been developed to sustain the species will be a fundamental goal for the PDM plan. The PDM plan will identify measurable management thresholds and responses for detecting and responding to significant changes in Virginia sneezeweed numbers, distribution, and persistence. If declines are detected equaling or exceeding these thresholds, the Service, in combination with other PDM participants, will investigate causes of these declines. The investigation will be to determine if Virginia sneezeweed warrants expanded monitoring, additional research, additional habitat protection, or resumption of Federal protection under the Act.

We appreciate any information on what should be included in post-delisting monitoring strategies for this species (see **Information Requested**, above).

Required Determinations

Clarity of the Proposed Rule

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

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;
- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as

specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

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, May 4, 1994), E.O. 13175 (Consultation and Coordination with Indian Tribal Governments), the President's memorandum of November 30, 2022 (Uniform Standards for Tribal Consultation; 87 FR 74479, December 5, 2022), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes and Alaska Native Corporations on a government-to-government basis. In accordance with Secretary's Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We will continue to work with Tribal entities during the development of a final listing determination for Virginia sneezeweed.

References Cited

A complete list of references cited in this rulemaking is available on the internet at <https://www.regulations.gov> under Docket No. FWS-R5-ES-2024-0058 and upon request from the Virginia Field Office (see **FOR FURTHER INFORMATION CONTACT**).List of

Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code

of Federal Regulations, as set forth below:

PART 17— ENDANGERED AND THREATENED WILDLIFE AND PLANTS

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

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

§ 17.12 [Amended]

2. In § 17.12, amend paragraph (h) by removing the entry for “*Helenium virginicum*” under FLOWERING PLANTS from the List of Endangered and Threatened Plants.

Justin Shirley,
Principal Deputy Director
U.S. Fish and Wildlife Service.

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