Billin

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2019–0080; FXES11130900000-212-FF09E22000]

RIN 1018–BD82

Endangered and Threatened Wildlife and Plants; Removing *Arenaria cumberlandensis* (Cumberland Sandwort) from the Federal List of Endangered and Threatened Plants

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are removing Cumberland sandwort (*Arenaria cumberlandensis*) from the Federal List of Endangered and Threatened Plants (List). This determination is based on a thorough review of the best available scientific and commercial data, which indicate that Cumberland sandwort has recovered and no longer meets the definition of an endangered or a threatened species under the Endangered Species Act of 1973, as amended (Act). Our review shows that threats to the species identified at the time of listing (i.e., timber harvesting, trampling from recreational uses, and digging for archaeological artifacts) have been reduced to the point that they no longer pose a threat to the species, and the known range and abundance of Cumberland sandwort have increased. Our review also indicates that potential effects of projected climate change are not expected to cause the species to become endangered in the foreseeable future. Accordingly, the prohibitions and conservation measures provided by the Act will no longer apply to this species.

DATES: This rule is effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: The proposed rule and this final rule, supporting documents, the post-delisting monitoring plan, and the comments received on the proposed rule are available at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2019–0080.

FOR FURTHER INFORMATION CONTACT: Daniel Elbert, Field Supervisor, U.S. Fish and Wildlife Service, Tennessee Ecological Services Field Office, 446 Neal Street, Cookeville, TN 38501; telephone (931) 528–6481. Individuals who use a telecommunications device for the deaf (TDD), may call the Federal Relay Service at (800) 877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species may be removed from the Federal List of Endangered and Threatened Plants (List) ("delisted") if it is determined that the species has recovered and no longer meets the definition of an endangered or threatened species. Removing a species from the List can only be completed by issuing a rule.

What this document does. This rule delists Cumberland sandwort from the Federal List of Endangered and Threatened Plants based on the species' recovery.

The basis for our 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: (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 factors in delisting a species.

We have determined that Cumberland sandwort is not in danger of extinction now nor likely to become so in the foreseeable future based on a comprehensive review of its

status and listing factors. Specifically, our recent review indicated: (1) An increase in the known number of occurrences of the species within its geographically restricted range, and increased abundance in some occurrences; (2) resiliency to existing and potential threats; (3) the protection of 66 extant occurrences located on Federal and State conservation lands by regulations or management plans to prevent habitat destruction or removal of plants; and (4) the implementation of beneficial management practices. Accordingly, Cumberland sandwort no longer meets the definition of an endangered or threatened species under the Act.

Peer review and public comment. 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 sought peer review of our April 27, 2020, proposed rule to delist the species (85 FR 23302). The Service sent the proposed rule to five independent peer reviewers and received three responses. The purpose of peer review is to ensure that our determination is based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in the biology, habitat, and threats to the species.

Previous Federal Actions

On April 27, 2020, we published in the *Federal Register* (85 FR 23302) a proposed rule to remove Cumberland sandwort from the Federal List of Endangered and Threatened Plants (i.e., to delist the species). Please refer to that proposed rule for a detailed description of previous Federal actions concerning this species. The proposed rule and supplemental documents are provided at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2019–0080.

Summary of Changes from the Proposed Rule

We made no substantive changes to the proposed rule in this final rule. We made minor editorial changes in this rule in response to comments we received on the proposed rule.

Summary of Comments and Recommendations

In our April 27, 2020, proposed rule to delist Cumberland sandwort (85 FR 23302), we requested that all interested parties submit written comments on the proposed delisting and our draft post-delisting monitoring (PDM) plan by June 26, 2020. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposed delisting and draft PDM plan. A newspaper notice inviting general public comments was published in the Fentress Courier (major local newspaper) and also announced using online and social media sources. We received one substantive comment from the public, which is discussed below under *(1) Comment*, and no requests for a public hearing.

In addition, we reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the proposed delisting rule and PDM plan for Cumberland sandwort. The peer reviewers generally concurred with our methods and conclusions, and they provided additional information, clarifications, and suggestions to improve the final delisting rule. Peer reviewer comments are summarized below under *(2) Comment* through *(4) Comment*, and incorporated into this final rule as appropriate.

(1) Comment: One commenter expressed concern that the unique habitat of the species would be less protected if the species were delisted.

Our response: Cumberland sandwort habitats on both State and Federal conservation lands will remain protected by rules, regulations, or plans governing the establishment or management of those lands. The species is also still State-protected where it occurs. At this time, Cumberland sandwort meets the standard for delisting

under the Act: it no longer meets the Act's definitions of an "endangered species" or a "threatened species." We will continue to work with recovery partners to maintain the species' recovered state and conduct post-delisting monitoring, as well.

(2) Comment: One peer reviewer requested clarification concerning whether abundance estimates, in addition to hand drawn maps and the numbers of patches depicted on the maps, were used in determining population resiliency indices and evaluating population trends. The reviewer also asked how estimates of abundance were determined.

Our response: We explain below under *Framework for Monitoring and Evaluating Trends* that we used visual estimates of abundance or discrete counts of individuals, where available, to supplement data provided on hand drawn maps when determining population resiliency indices and evaluating population trends.

(3) Comment: One peer reviewer informed us that data on global forest loss (*https://earthenginepartners.appspot.com/science-2013-global-forest*) were available to use in quantifying forest loss in portions of the watersheds where Cumberland sandwort is found.

Our response: We used the data available at the reference provided by the peer reviewer to provide an objective basis for evaluating whether we correctly identified evidence of logging activity in forests near Cumberland sandwort occurrences. Based on this evaluation, we correctly identified locations where logging activities had taken place in the vicinity of Cumberland sandwort occurrences when preparing the April 27, 2020, proposed rule to delist Cumberland sandwort (85 FR 23302).

(4) Comment: One peer reviewer asked whether disturbance from recreational use was likely to increase in proportion to human population growth and increased participation in outdoor activities. The reviewer also asked how Cumberland sandwort population trends in sites where management had occurred to reduce the threat of

inadvertent trampling by recreationists compared to population trends in unmanaged sites where the threat of trampling existed.

Our response: We address this comment below under *Habitat Loss and Curtailment of Range* where we discuss the lack of a clear trend in available data regarding visitation rates to lands where Cumberland sandwort occurs . We also added a discussion comparing population trends in sites where protective measures have been installed to reduce the threat of trampling to trends that have been observed in other sites where the risk of trampling has been previously recorded but no protective measures have been installed.

Final Delisting Determination

Species Information

Below, we present a thorough review of the taxonomy, life history, ecology, and overall status of this plant, referencing data from the 2013 5-year review (Service 2013) where appropriate.

Taxonomy

Cumberland sandwort (*Arenaria cumberlandensis*), a member of the Pink family (Caryophyllaceae), was first recognized and described as a species in 1979 (Wofford and Kral 1979, entire). This species, along with several other species of *Arenaria,* was transferred to the genus *Minuartia* while retaining the specific epithet (McNeill 1980, entire). The species is listed as *Minuartia cumberlandensis* (Wofford and Kral) McNeill in A Fifth Checklist of Tennessee Vascular Plants (Chester et al. 2009, p. 43), the Integrated Taxonomic Information System (ITIS) (2019), and Flora of North America (2019). However, an examination of the taxonomy of *Minuartia* using DNA sequences determined that all species in *Minuartia* section *Uninerviae* should be elevated to genus *Mononeuria*, along with *Geocarpon minimum* (Dillenberger and Kadereit 2014, p. 79).

The Flora of the Southern and Mid-Atlantic States accepted this recommendation, assigning the name *Mononeuria cumberlandensis* (B.E. Wofford & Kral) Dillenberger & Kadereit to Cumberland sandwort (Weakley 2015, p. 820). Although changes have been made to the species' taxonomy since the time of listing, we are removing the species from the List of Endangered and Threatened Plants using the name by which it was initially listed, *Arenaria cumberlandensis* (=*Mononeuria cumberlandensis*).

Species Description

The following description of Cumberland sandwort is modified from Wofford and Kral (1979, pp. 257–259) and Kral (1983, pp. 363–364). This species is a delicate perennial that occurs in small cushionlike clumps, with upright stems 10 to 15 centimeters (cm) (4 to 6 inches (in)) tall that are slender and triangular in shape. Leaves are opposite, 2 to 3 cm (0.8 to 1.2 in) long and 1 to 3 millimeters (mm) (0.04 to 0.12 in) wide, and are thin and bright green in color, with glassy margins. Basal leaves are longer and wider than those at the top of the stems. The flowers are symmetrical, five-parted, and usually solitary at the end of the stems. The sepals (a part of the flower that provides protection for the flower in bud and sometimes provides support for petals when in bloom) are green and inconspicuously three-veined, and the white petals usually have five green veins. The fruit is a 3- to 3.5-mm-long (0.12- to 0.14-in) ovoid capsule containing numerous reddish-brown reticulated (having the form or appearance of a net) seeds that are 0.5 to 0.7 mm (0.02 to 0.03 in) long.

The mild conditions of the sheltered habitat where Cumberland sandwort occurs allow rosettes (circular arrangement of leaves) to persist through winter and produce abundant, leafy stems in the spring (Winder 2004, p. 5). The species flowers from May through August, with some flowers persisting as late as November (Wofford and Kral 1979, p. 259; Winder 2004, p. 5).

Habitat

Cumberland sandwort inhabits fine-grained, sandy soils that comprise the floors of the interior of "rockhouses" (cave-like recesses produced by differential weathering of sandstone). These habitats are typically behind the dripline of overlying cliffs, ledges, and solution pockets of cliffs, where these features are found in Pennsylvanian sandstones on the Cumberland Plateau in southern Kentucky and northern Tennessee (Horton 2017, entire). The species occupies sites that generally share characteristics of high levels of shade, moisture, and humidity, and relatively constant, cool temperatures (Wofford and Smith 1980, p. 7), although some smaller occurrences occupy drier and warmer sites. Few other species are directly associated with Cumberland sandwort microsites, but the following species are important indicators that suitable habitat conditions are present within a given rockhouse or bluff site: *Silene rotundifolia* (round-leaved catchfly); *Thalictrum clavatum* (mountain meadow-rue); *Heuchera parviflora* (little-flowered alumroot); *Ageratina luciae-brauniae* (Lucy Braun's snakeroot); *Stenanthium diffusum* (diffuse feather-bells); and the bryophytes *Vittaria appalachiana* (Appalachian shoestring fern), *Bryoxiphium norvegicum* (Norway bryoxiphium moss), and *Scopelophila cataractae* (cataract scopelophila moss) (Tennessee Department of Environment and Conservation (TDEC) 2011b, p. 5).

Distribution

When Cumberland sandwort was listed as endangered (53 FR 23745; June 23, 1988), the species was known from 11 occurrences (Wofford and Smith 1980, pp. 9–18), which were treated as 5 populations. Of these occurrences, 1 was in McCreary County, Kentucky, and 10 were distributed among four Tennessee counties (Fentress, Morgan, Pickett, and Scott). The species recovery plan (Service 1996, pp. 6–8) reported that 28 occurrences were extant (including the 11 from the June 23, 1988, listing rule), 27 of which were partly or entirely located on publicly owned conservation lands. One of these

28 occurrences was in McCreary County, Kentucky, and the remaining 27 were distributed among the four Tennessee counties reported in the listing rule. All occurrences reported in the listing rule and species recovery plan were located in the South Fork Cumberland River drainage. Of these 28 occurrences, all but 3 were extant as of 2017 (TNHID 2018).

As explained below, documentation to verify past or present existence is lacking for two of the three occurrences we did not determine to be extant as of 2017, raising questions regarding their validity. The "Middle Creek 2" occurrence reported in the recovery plan was apparently based on an observation reported by a National Park Service (NPS) archaeologist, but staff of the TDEC Division of Natural Areas (TDNA) were unable to confirm the presence of Cumberland sandwort at the mapped location, which they attribute to a mapping error when the occurrence was reported. The Morgan County, Tennessee, occurrence reported in the recovery plan, with only the site name "Sunbright" given for location information, also cannot be verified. No citation was provided in the recovery plan for this record, and no record existed for this site in the Tennessee Natural Heritage Inventory Database (TNHID) (2018), maintained by the Natural Heritage Program at TDNA. A search of herbarium records for Cumberland sandwort from Morgan County, Tennessee, produced no specimens from the vicinity of Sunbright (SERNEC Data Portal 2018). However, a new extant occurrence record was documented in TNHID for Scott County, based on the label for a specimen collected in 2002 from a site not previously known to be occupied by Cumberland sandwort.

The Big Branch occurrence reported in the recovery plan was not recorded in the TNHID (2018), so no attempts have been made to relocate this occurrence. Staff from NPS reported the occurrence in comments provided after reviewing the draft recovery plan (NPS 1995). We provided information to TDNA on the Big Branch occurrence reported by NPS, and there is now a historical record for this occurrence in the TNHID.

In order to evaluate the current status of Cumberland sandwort, we used data from Natural Heritage Programs in Kentucky (KNHP 2018) and Tennessee (TNHID 2018) to determine the location and condition of mapped element occurrences. An element occurrence (EO) is a fundamental unit of information in the NatureServe Natural Heritage methodology, and is defined as "an area of land and/or water in which a species…is, or was present" (NatureServe 2004). There were 64 extant occurrences of Cumberland sandwort reported in the 2013 5-year review. As of 2018, there were 71 extant occurrences, distributed among the five counties where the species was reported to be extant when the recovery plan was published: 1 in McCreary County, Kentucky (Kentucky Natural Heritage Program (KNHP) 2018); 1 in Morgan County, 26 in Fentress County, 38 in Pickett County, and 5 in Scott County, Tennessee (TNHID 2018). Of these occurrences, 12 occur within the Obey River drainage in Tennessee; 11 of these occurrences have been discovered since 2005 on recently acquired, State-owned conservation lands, and 1 on privately owned lands in 2016. The remaining 59 occurrences lie within the South Fork Cumberland River drainage, and all but 1 of these occurrences is in Tennessee. Four of the occurrences in the South Fork Cumberland River drainage are located on privately owned lands in Tennessee; the remainder are located on State or Federal conservation lands. In addition to these 71 natural occurrences of Cumberland sandwort, one introduced occurrence has been established in McCreary County, Kentucky, on the Daniel Boone National Forest (DBNF) (Pence *et al.* 2011, entire).

Population Genetics

In a study of populations in Tennessee, Cumberland sandwort was found to possess "fairly high" levels of genetic variation (Winder 2004, pp. 16–19). Observed levels of heterozygosity were consistent with expected effects of frequent mating among closely related individuals, or inbreeding (Winder 2004, p. 19), a common phenomenon

in small populations due to the greater likelihood that most or all individuals in the population will be closely related (Allendorf and Luikart 2007, p. 306). Greater genetic similarity was found among populations within about 4 kilometers (km) (2.5 miles (mi)) of one another, but a wide range of values were observed at distances of 4 to 25 kilometers (2.5 to 15.5 mi), beyond which populations were consistently dissimilar (Winder 2004, p. 27). Thus, Cumberland sandwort populations generally are genetically independent of one another and have been for a significant period of time, with possible exceptions where gene flow could occur among densely clustered populations in close geographic proximity to one another (Winder 2004, p. 28). The majority of the genetic variation found in the species is retained within a central cluster of populations located in Pickett County, Tennessee, and in Laurel Fork (Fentress County), Tennessee (Winder 2004, p. 37). The genetic structure of the sole Kentucky population and its relation to sites sampled in Tennessee are unknown.

Framework for Monitoring and Evaluating Trends

The TDEC Natural Heritage Program began monitoring Cumberland sandwort in Tennessee during 2000, visually estimating abundance in 34 sites as part of a project to conduct surveys for new locations and update records for previously known occurrences of the species (TDEC 2000, entire). The number of occurrences monitored has increased to 55, and TDEC has categorized sites into three tiers of differing priority, with the highest priority sites (i.e., Tier 1) being the most frequently monitored (TDEC 2007, p. 5):

- Tier 1 sites have a history of site disturbance related to recreational use or illicit digging of Native American artifacts.
- Tier 2 sites face fewer immediate threats in the less frequently visited sites they occupy.
- Tier 3 sites faced no imminent threats at the time of categorization.

Designating tiers provides for more frequent monitoring of sites with a greater likelihood of being adversely affected by known threats that could warrant management intervention. Tier 1 sites are monitored every 1 to 3 years, Tier 2 sites every 3 to 6 years, and Tier 3 sites every 6 to 10 years (TDEC 2007, p. 5). In addition to monitoring during 2000 and 2006 (before the tier system was developed), TDEC monitored Tier 1 sites during 2010 and 2011 (TDEC 2011a, entire), 2014 (TDEC 2014, entire), and 2017 (TDEC unpublished data). Tier 2 sites were monitored during 2011 through 2012 (TDEC 2012, entire), and Tier 3 sites were monitored during 2016 and 2017 (TDEC unpublished data).

The Service receives monitoring data in the form of written reports and occurrence-level summary data provided in the TNHID (2018). We used these summary data to determine which sites in each tier had been monitored in 2 or more years, making it possible to assess whether Cumberland sandwort had declined, remained stable, or increased either in estimated abundance or area occupied. Available abundance data were typically produced by visually estimating numbers of plants, although precise count data were available in some instances. Based on data provided in the TNHID, 18 occurrences are in Tier 1, 24 in Tier 2, and 13 in Tier 3 for which such data were available. Tier 1 occurrences have been monitored an average of 4.7 times, with time between initial and the most recent monitoring events averaging 15.8 years. Tier 2 occurrences have been monitored an average of 2.4 times over an average timespan of 8.4 years. Tier 3 occurrences have been monitored an average of 2.4 times over an average timespan of 12.1 years. Fifteen occurrences in Tennessee have been monitored only once or have not, as yet, been assigned to a monitoring tier.

After reviewing all available monitoring data, TDEC assessed whether individual occurrences had declined, remained stable, or increased over the time that they have been monitored (McCoy 2018, pers. comm.). However, statistical trend analysis of

Cumberland sandwort monitoring data from Tennessee is not feasible for two reasons: first, estimates of abundance generated in 2000 and in later monitoring events lack adequate precision for statistically analyzing change in abundance over time, and second, visual estimates of area occupied by the species can introduce potential for observer bias because these areas are not precisely measured. However, the preparation of hand-drawn maps by TDEC botanists, beginning with the initial monitoring effort in 2000, allows tracking persistence and stability of individual patches within occupied sites and detecting substantial changes in their estimated size. Maps are also updated to depict new patches that might form due to recruitment of individuals in previously unoccupied habitat. Estimates of abundance, where available, provided supplemental data for qualitatively evaluating trends within mapped patches of habitat. Based on the best available data, of the 18 Tier 1 occurrences, 2 demonstrate evidence of decline, 13 are stable, and 3 have increased. Of the 24 Tier 2 occurrences that have been monitored on two or more occasions, 5 demonstrate evidence of decline, 18 are stable, and 1 has increased. Of the 13 Tier 3 occurrences, 2 have declined, 10 are stable, and 1 has increased (McCoy 2018, pers. comm.).

Recovery

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. 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.

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 criteria being fully met. For example, one or more criteria may have been 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 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 Cumberland Sandwort Recovery Plan (Service 1996, pp. iv, 10) included recovery criteria to indicate when threats to the species have been adequately addressed and prescribed actions that were thought to be necessary for achieving those criteria. Below we discuss our analysis of available data and our determination as to whether recovery criteria for Cumberland sandwort have been achieved.

Recovery Criteria

The objective of the recovery plan is to delist the Cumberland sandwort. Recovery criteria in the plan state that *Arenaria cumberlandensis* (Cumberland sandwort) will be considered for reclassification from endangered to threatened status when 30 geographically distinct, self-sustaining occurrences are protected in four counties in Tennessee and Kentucky and have maintained stable or increasing numbers for 5 consecutive years. The species will be considered for delisting when 40 geographically distinct, self-sustaining occurrences are protected and have maintained statistically stable or increasing numbers for 5 consecutive years. At least 12 of these occurrences must be in counties other than Pickett County, Tennessee.

Methods were chosen for monitoring that minimize trampling of Cumberland sandwort and disturbance of the sandy soil substrate the species occupies. The tradeoff of using this method to minimize disturbance is the inability to statistically analyze trends for individual occurrences or Cumberland sandwort as a species. To address this limitation, we developed a framework for using available distribution and monitoring data, aerial photography, and qualitative assessment of trends for each occurrence to evaluate whether recovery criteria for Cumberland sandwort have been achieved.

Using this framework, we assessed the species' viability based on the three conservation biology principles of resiliency, representation, and redundancy (Shaffer and Stein 2000, entire). Resiliency is the ability to sustain populations in the face of environmental variation and transient perturbations. To be resilient, a species must have healthy populations that are able to sustain themselves through the range of possible environmental conditions. The greater the number of healthier populations, the more resiliency a species possesses. Representation is the range of variation or adaptive diversity found in a species, and is the source of a species' ability to adapt to near- and long-term changes in the environment. Maintaining adaptive diversity requires

conserving both ecological and genetic diversity, which enable a species to be more responsive and adaptive to change and, therefore, more viable. Finally, redundancy protects species against the unpredictable and highly consequential events for which adaptation is unlikely, allowing them to withstand catastrophic events. Redundancy spreads risk and is best achieved by having multiple populations widely distributed across a species' range.

We characterized the resiliency of 69 of the 71 extant Cumberland sandwort occurrences using available data on three factors (complete data were not available for two of the extant occurrences): occurrence size expressed as estimated abundance or areal coverage, recorded observations of threats causing disturbance to plants or the substrates in which they were rooted, and assessment of general forest conditions from recorded observations or evaluation of aerial photography, for the reasons that follow. Occurrence size influences resiliency because smaller populations are at greater risk of (1) losing genetic variation due to drift (change in the frequency of alleles in a population due to random, stochastic events), and (2) inbreeding, which decreases the likelihood that an individual will receive pollen from a compatible mate and produce viable offspring (Allendorf and Luikart 2007, pp. 122–123). Small populations also may face higher risks of extinction due to diminished resilience to demographic and environmental stochasticity (Münzbergová 2006, p. 143). Demographic stochasticity is the variation in vital rates (i.e., probabilities of survival and reproduction) among individuals of a given age or life-cycle stage, at a given point in time, while environmental stochasticity is variation in vital rates over time, affecting all individuals of a given age or stage similarly (Lande 1988, p. 1457). Incorporating available data regarding disturbance to Cumberland sandwort plants or the substrates where they occur into the resiliency assessment serves as a proxy indicating whether physical conditions are appropriate to support multiple life stages. Undisturbed substrates contribute to Cumberland sandwort

resiliency by providing suitable sites for germination, growth, and reproduction to occur. Similarly, evaluating forest condition in the vicinity of Cumberland sandwort occurrences is a proxy indicating whether ecological conditions are likely to support resilience to environmental variation. The presence of contiguous forest vegetation in the vicinity of Cumberland sandwort occurrences helps to maintain suitable hydrology and microclimate, potentially buffering severity of stress resulting from environmental perturbations, such as drought. We evaluated representation by considering the distribution of resilient occurrences among the counties and watersheds from which the species is known. Finally, we evaluated redundancy based on the overall number of resilient occurrences distributed throughout its range.

In evaluating resiliency, we used estimates of abundance, where available, combined with estimates of areal coverage to provide a basis for categorizing occurrences into groups of low, medium, or high abundance. Occurrences with fewer than 100 individuals (Heschel and Page 1995, pp. 128–131; Münzbergová 2006, p. 148) or with areal coverage less than 1 square meter (m^2) were ranked "low"; occurrences with 100–1,000 individuals or with areal coverage ranging from 1 to 5 m^2 were ranked "medium"; and occurrences with more than 1,000 individuals or areal coverage greater than 5 m^2 were ranked "high." We ranked substrate conditions at each occurrence based on recorded observations of threats (TDEC 2011b, pp. 37–44). Substrate conditions were ranked "high" for sites with no record of disturbance; "medium" for sites with moderate risk of exposure to the threat based on limited historical evidence of digging for archeological artifacts (i.e., relic digging) or trampling by humans or wildlife in limited areas within available habitat; and "low" for sites with high risk of exposure as indicated by recent evidence of relic digging or trampling throughout available habitat. We used aerial imagery available through Google Earth Pro™ to determine whether forests in the general vicinity of Cumberland sandwort occurrences exhibited signs of timber harvest,

as indicated by substantially reduced tree densities; presence of logging equipment trails; or conversion to nonnative, evergreen forest types. We used available data on global forest loss to provide an objective basis for confirming our determination of locations where timber harvest was suspected to have taken place (Hansen *et al.* 2013, entire). Forest conditions were ranked "high" in locations where late seral forest was present upslope and downslope of occupied sites and in adjacent areas; "medium" in locations where risk of exposure to the threat was moderate based on evidence of logging having occurred within the prior 15 years in the vicinity of, but not immediately upslope, downslope, or adjacent to, occurrences; and "low" in sites where risk of exposure was high based on evidence of logging within the prior 15 years in the forest immediately surrounding the occupied habitat.

Of the 69 occurrences that we could evaluate for all three resiliency factors, 12 were ranked as low in abundance, 27 ranked medium, and 30 ranked high. Substrate conditions ranked low at 12, medium at 25, and high at 32 occurrences. We were able to evaluate forest conditions at all 71 extant occurrences, with the following results: 8 occurrences ranked low, 3 ranked medium, and 60 ranked high.

Using the ranks for the three resiliency factors (abundance, substrate condition, and forest condition), we calculated an overall resiliency index for 68 of the 70 Tennessee occurrences (see Table 1, below) and the sole Kentucky occurrence. We assigned numerical scores of one for factor ranks of "low," two for "medium" ranks, and three for "high" ranks. Using these scores, we calculated a weighted average, wherein factor ranks for abundance were given twice the weight of factor ranks for substrate and forest condition, due to the importance of population size in maintaining genetic variation and determining resilience to demographic and environmental stochasticity (Sgrò *et al.* 2011, p. 329). The resulting resiliency index for an occurrence ranges from one to three and is categorized as follows:

- Low rank for scores of 1.5 or less;
- Low-medium rank for scores greater than 1.5 and less than 2.0;
- Medium rank for scores greater than 2.0 and less than 2.5;
- Medium-high rank for scores greater than 2.5 and less than 3.0;
- High rank for scores of 3.0.

Available data for the Kentucky occurrence indicate that the species abundance rank is medium at that location and that the occurrence is not exposed to threats from trampling or relic digging. This location, in Big South Fork National Scenic River and Recreation Area (BSF), is protected from timber harvesting, and available data indicate that surrounding forests are undisturbed. These factors produced an overall resiliency rank of medium for this occurrence.

In Tennessee, 56 occurrences had overall resiliency ranks of medium or higher. Table 1 shows the resiliency ranks for 68 of the 70 Tennessee occurrences. All of the stable and increasing trends in the medium, medium-high, and high resiliency ranks represent counts of occurrences considered self-sustaining, as required by recovery criteria.

Table 1. Resiliency index ranks for Cumberland sandwort occurrences in Tennessee.

Monitoring Tier	Trend	Low	Low-Medium	Medium	Medium-High	High
One	Decline	2	--	--	--	--
	Stable	1	1	7	4	--
	Increase	--	--	--	2	1
Two	Decline	3	--	2	--	--
	Stable	2	--	10	3	2
	Increase	--	--	--	1	--
Three	Decline	1	--	1	--	--
	Stable	--	--	4	3	3
	Increase			1		
Other	n/a	1	1	7	--	5
Total		10	2	32	13	11

For the purpose of evaluating Cumberland sandwort's status with respect to recovery criteria, we define self-sustaining to include those populations that had an overall resiliency index rank of medium or higher and that TDEC determined were stable or increasing (see Table 1, above) based on available monitoring data, as described above in **Species Information**. For the Kentucky occurrence, available data indicate that the occurrence is stable. We consider 66 occurrences on Federal or State conservation lands (see Table 2, below), as well as 2 occurrences located on private lands where land use is restricted by conservation easements, to be protected. Using these definitions, 42 protected occurrences (including the 1 in Kentucky) are self-sustaining (Table 1, above, presents data for Tennessee). These occurrences have been known to exist for an average of 21 years, with a range of 7 to 44 years spanning the first and most recent observations recorded for the species in these sites. These data support the conclusion that one criterion for removing Cumberland sandwort from the List has been exceeded, i.e., that there be at least 40 geographically distinct, protected, and self-sustaining occurrences that have been stable or increasing for at least 5 years.

Table 2. Land ownership for 66* Cumberland sandwort occurrences on Federal and State conservation lands.

Agency	Land Unit	Number of Occurrences*
National Park Service	Big South Fork National Scenic River and Recreation Area (BSF)	27
Tennessee Division of Forestry (TDF)	Pickett State Forest (PSF)	29 (4 partially on TSP lands)
Tennessee Division of Natural Areas	Pogue Creek Canyon State Natural Area (PCNA)	7
Tennessee State Parks (TSP)	Pickett CCC Memorial State Park (PSP)	7 (4 partially on TDF lands)

* Number of occurrences in this table sums to 70, but 4 occurrences occupy habitats spanning adjacent lands owned by TDF and TSP and are counted only once for the total.

The recovery criteria in the recovery plan also require that at least 12 of the protected, self-sustaining occurrences be located outside of Pickett County, Tennessee, which provides for redundancy across areas of representation within the species'

geographic range. Of the 42 occurrences meeting the criterion of being protected and self-sustaining, 28 are located in Pickett County, Tennessee; 13 are located elsewhere in Tennessee (9 in Fentress County, 4 in Scott County); and 1 is located in McCreary County, Kentucky. Thus, this delisting criterion is also exceeded.

Another measure of representation for the species is its distribution among major watersheds in which it is found. The recovery plan reported in 1996 that the species was known only from the South Fork Cumberland watershed, but it is now also known from 12 occurrences in the Obey River watershed in Tennessee. Of the 42 occurrences meeting the recovery criterion that there be at least 40 geographically distinct, protected, and self-sustaining occurrences, 2 are located in the Obey River watershed. The low number of occurrences in this watershed meeting this criterion is primarily due to the recent discovery of many of the occurrences in this watershed and the consequent lack of repeat observations. In addition to the two occurrences in the Obey River watershed meeting the recovery criterion above, nine occurrences on protected lands have resiliency indices of medium or higher.

Our assessment of the viability of Cumberland sandwort supports the determination that the recovery criteria for delisting the species have been satisfied. The discussion above demonstrates that there are more than 40 protected and self-sustaining occurrences of the species, distributed among four counties in Tennessee and one in Kentucky.

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533) 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 due to 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.

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.

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. The term foreseeable future extends only so far into the future as we can reasonably determine that both the future threats and the species' responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. "Reliable" does not mean "certain"; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species' likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species' biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

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 the same five factors identified above for listing a species. When Cumberland sandwort was listed as endangered in 1988, the identified threats (factors) influencing its status were the modification and loss of habitat and curtailment of range (Factor A), the inadequacy of State or Federal mechanisms to protect its habitat at that time (Factor D), and its limited distribution and low abundance in some populations (Factor E). The following analysis

evaluates these previously identified threats, any other threats currently facing the species, as well as any other threats that are reasonably likely to affect the species in the foreseeable future following the delisting and the removal of the Act's protections.

To establish the foreseeable future for the purpose of determining whether Cumberland sandwort meets the definition of an endangered or threatened species, we evaluated trends from historical data on distribution and abundance, ongoing conservation efforts, factors currently affecting the species, and predictions of future climate change. Structured monitoring of Cumberland sandwort populations began in 2000, but records of initial observations for occurrences range from 1973 to 2017, with an average of 18 years between the earliest and most recent recorded observations for a given occurrence. The period of observation is 30 or more years for 16 occurrences, which vary in population size and threat exposure. These historical data provide insight into Cumberland sandwort's exposure and response to potential threats under varying conditions. When combined with our knowledge of factors affecting the species, available data allow us to reasonably predict future conditions, albeit with diminishing precision over time. Given our understanding of the best available data, we consider the foreseeable future for Cumberland sandwort to be approximately 30 years for the purposes of this rule.

In assessing threats to Cumberland sandwort, we consider the exposure of individual occurrences to suspected stressors, available data on the species' response to those stressors where they have been observed, and efforts undertaken to reduce exposure into the future. As noted above in *Recovery Criteria*, available data indicate that the Kentucky occurrence is not exposed to threats that would result in modification or destruction of habitat.

Habitat Loss and Curtailment of Range

In the rule listing the Cumberland sandwort (53 FR 23745; June 23, 1988), the primary threats identified for the species were the destruction and modification of habitat due to trampling by recreational users of the rockhouse and bluff habitats where the species occurs, trampling and soil disturbance from looting of archeological artifacts (i.e., relic digging), and timber harvesting in or adjacent to occupied sites.

In Tennessee, the potential for trampling or soil disturbance from recreational use, wildlife, or relic digging has been noted at 38 sites where Cumberland sandwort occurs, with varying degrees of exposure and actual risk for adversely affecting the species (TDEC 2011b, pp. 40–44; TNHID 2018). In one of these sites (EO 78), signs of trampling and a fire pit were observed on the rockhouse floor in 2007 (TNHID 2018), but Cumberland sandwort plants are located on ledges and solution pockets on the bluff where they are not exposed to trampling. Additionally, no fire pit was observed during a site visit by the Service in February 2019. Of the other 37 sites where risk of trampling or soil disturbance has been recorded during monitoring or other site visits, available data indicate that Cumberland sandwort faces high risk of exposure in 12 of them and moderate risk in the other 25. Cumberland sandwort abundance has declined at 6 of the 12 sites with high exposure risk, while 6 have remained stable. Declines in abundance have been observed at only three of the sites with moderate risk of exposure, while increases have been observed at three others. The remaining 19 sites with moderate risk of exposure to the threat of trampling or soil disturbance have remained stable. Thus, while the potential threat of trampling or soil disturbance has been noted at many sites, Cumberland sandwort faces a high risk of actual exposure in less than 20 percent of occurrences. Under conditions of moderate exposure risk, the species has demonstrated low vulnerability to being adversely affected, having maintained stable populations in most instances. Regardless of the level of exposure risk, no occurrences are known to

have been extirpated as a result of trampling or soil disturbance from recreational use, wildlife, or relic digging.

Protective features, including fences, boardwalks, barricades, rerouted trails, or informational signs, have been installed at 8 of the 37 occurrences discussed above, protecting specific habitats occupied by Cumberland sandwort (Service 2013, pp. 13–14; TDEC 2016, p. 3). Seven of these sites where management has occurred to reduce the threat of trampling have remained stable or seen increases in Cumberland sandwort, whereas 20 of the 30 sites where the risk of trampling has been noted but not managed have remained stable. This information indicates that management efforts have been effective at reducing adverse effects, especially when considering that such management was provided in sites where the greatest threats were present. The seven occurrences at PCNA are protected from recreational activities by the State's efforts to survey proposed alignments for new trails and route them away from sites with Cumberland sandwort. Measures such as these reduce or preclude the species' exposure to the threat of trampling from recreationists using trails on public lands where the species occurs.

Available data reveal the lack of a clear trend in visitation rates to recreational lands where Cumberland sandwort occurs. The BSF experienced an overall decline in annual visitation levels from 892,322, in 1995, to 643,135 in 2015 (NPS 2020). Conversely, PSP, saw an overall increase from 223,397 to 271,889 annual visitors between 2009 and 2013 (Tennessee State Parks, no date). We are not aware of data regarding predicted trends in future visitation for these parks, nor are data available to estimate what proportion of visitors use trails where Cumberland sandwort is located.

Timber harvest occurs at PSF, but does not occur at BSF, PSP, or PCNA, limiting the potential magnitude of this activity, determined at the time of listing to be a threat to Cumberland sandwort, to less than half of the sites on conservation lands. During the course of evaluating forest conditions in the vicinity of Cumberland sandwort

occurrences, we observed that timber harvests had been conducted in the general vicinity of 10 occurrences at PSF, during the period between approximately 2008 and 2017. Timber harvests occurred upslope or downslope of seven of these occurrences, creating a high risk for exposure to potential effects of this threat, and in the general vicinity of three occurrences, where exposure risk was moderate. Sometime prior to 1999, the forest was converted to pasture on the plateau top above an eleventh occurrence, located on privately owned lands. Based on these data, timber harvests or forest conversion to pasture have taken place near approximately 15 percent of Cumberland sandwort sites. Data were available to evaluate trends for 10 of these 11 occurrences, showing that 3 have declined and 7 have remained stable. Monitoring data collected by TDEC since 2016 at three of these declining occurrences revealed no adverse effects from logging activities. These data support the conclusion that timber harvests in the vicinity of Cumberland sandwort occurrences that do not directly impact the species or its habitat may pose little threat in terms of indirect effects. This conclusion is also supported by observations from visits we conducted in February 2019 to four occurrences with nearby timber harvests, in which no adverse effects from off-site timber removal were detectable. Based on these observations, we conclude that our estimates of forest condition ranks, discussed above in *Recovery Criteria*, likely underestimate the resiliency of occurrences in those instances where forest condition ranks were reduced due to evidence of nearby logging activities.

While some Cumberland sandwort occurrences are exposed to potential habitat-related stressors that might, in certain situations, adversely affect the species, available monitoring data indicate that the species is less vulnerable to these threats than was determined at the time of listing. When Cumberland sandwort is removed from the List (see **DATES**, above), our post-delisting monitoring plan (see **Post-delisting Monitoring**, below) identifies 50 occurrences that will be monitored over a period of at least 5 years

following delisting, including 27 occurrences where risks of exposure to soil disturbance or trampling, effects of nearby timber harvests, or the two combined have been moderate to high. Continuing to monitor sites where Cumberland sandwort is or could be exposed to potential threats that were previously determined to place the species at risk of extinction will provide an opportunity to work with land managers to avoid or minimize adverse effects should the threats increase in severity or extent.

In our analysis of Cumberland sandwort's resiliency, discussed above in *Recovery Criteria*, we incorporated available data regarding threats that could potentially modify habitat or curtail the species' range. We determined that 42 occurrences currently meet the criterion of being protected and self-sustaining. These occurrences have been known to exist for an average of 21 years, with a range of 7 to 44 years from the first to the most recent observations recorded for the species in these sites. In addition to these 42 occurrences, 9 occurrences are protected in the Obey River watershed and 2 in the South Fork Cumberland watershed in Tennessee for which sufficient monitoring data for evaluating trends in abundance or threats is lacking. However, seven of these occurrences in the Obey River drainage have no evidence of substrate or forest disturbance and are located in PCNA, where TDEC (no date, pp. 10–11) surveys potential trail routes to prevent new trail construction that would expose occurrences to threats from recreational uses. No other potential threats to the habitats at PCNA have been documented. The two occurrences in the South Fork Cumberland drainage are located in BSF and are not affected by any known threats because they are remotely located from trail access and protected from timber harvest.

Thus, available data indicate that Cumberland sandwort is resilient to the factors discussed above that were determined at the time of listing to constitute a threat of habitat modification or curtailment of the species' range. Additionally, management actions

have been effective at reducing potential adverse effects of disturbance associated with recreational activities at sites where those activities are most prevalent.

Limited Distribution and Small Population Sizes

The listing rule for Cumberland sandwort (53 FR 23745; June 23, 1988) identified the species' restricted distribution, limited to a small portion of the Cumberland Plateau in northern Tennessee and southern Kentucky, and the small size of many populations, as factors increasing the risks of population loss and potential extinction of the species. The species is still restricted to a small portion of the Cumberland Plateau, but the number of known occurrences has increased from 11 at the time of listing (Wofford and Smith 1980, pp. 9–18; 53 FR 23745, June 23, 1988) to 71 currently (TNHID 2018). Three projects have been funded to support searches for new Cumberland sandwort occurrences (Kentucky State Nature Preserves Commission (KSNPC) 1991, entire; TDEC 2000, entire; TDEC 2008, entire). The single search effort that occurred in Kentucky, only in McCreary County, did not expand the known range of Cumberland sandwort, but confirmed the known occurrence located in Big Spring Hollow and documented that thousands of plants were present at two sites mapped at the occurrence (KSNPC 1991, entire). Searches conducted in Tennessee in 2000 (TDEC 2000, entire) and 2006–2007 (TDEC 2008, entire) produced records for 30 new occurrences on conservation lands in Fentress, Pickett, and Scott Counties, Tennessee. In addition to these three Cumberland sandwort survey projects, surveys at PCNA for prospective trail routes have produced records for six additional occurrences on conservation lands in Fentress County (TNHID 2018). These survey efforts, funded in part by the Service via the Act's section 6 grants to State agencies for endangered species recovery, contributed greatly to increasing the species' distribution to the 71 extant occurrences known today.

Fourteen protected and self-sustaining occurrences are located outside of Pickett County, satisfying the recovery criterion concerning geographic distribution. Also, 12 of

the 71 occurrences are located in the Obey River watershed in Tennessee, increasing the species' distribution beyond the South Fork Cumberland watershed, to which the species was thought to be restricted at the time of listing.

The 1988 listing rule discussed small population size as a threat to many occurrences, but did not include information on population sizes known at the time or specify the number of individuals or the size of habitat area occupied that would be necessary to buffer against extinction risk. As discussed above in *Recovery Criteria*, we used available data to evaluate the species' abundance at known occurrences. We consider populations consisting of fewer than 100 individuals or occupying less than 1 m^2 of habitat to be at heightened risk of (1) losing genetic variation due to drift (change in the frequency of alleles in a population due to random, stochastic events), and (2) inbreeding, which decreases the likelihood that an individual will receive pollen from a compatible mate and produce viable offspring (Allendorf and Luikart 2007, pp. 122–123). However, we note that the risk of inbreeding depression due to unavailability of incompatible mates might be low for Cumberland sandwort, as self-compatibility apparently evolved twice in geographically distant populations of the closely related congener *Mononeuria* (=*Arenaria*) *glabra* at the edges of that species' range (Wyatt 1984, p. 815). Based on available data, 12 populations consist of fewer than 100 individuals or occupy less than 1 m^2 of habitat. Six of these 12 have been known to persist as small populations for lengths of time ranging from 24 to 41 years, indicating that even small populations are likely to persist when threats are minimized (TNHID 2018). The remaining six were discovered in 2000 or later. In contrast, 27 occurrences contain 100–1,000 individuals or occupy 1 to 5 m^2 of habitat, and 30 occurrences contain more than 1,000 individuals or occupy greater than 5 m^2 of habitat. Estimates of abundance available for 24 of the largest occurrences indicate that they collectively hold at least 67,000 Cumberland sandwort individuals. These data demonstrate that risks

associated with small population size are a potential threat likely affecting less than 20 percent of the 71 extant Cumberland sandwort occurrences. Despite the potential risks associated with small population sizes, available data demonstrate long-term persistence of Cumberland sandwort at all sites where abundance is low and stable or increasing trends at more than 60 percent of the small populations for which trend data are available. Thus, available data support the conclusion that small population size is neither a widespread threat to Cumberland sandwort nor has it been demonstrated to place populations at high risk of decline or extirpation.

Techniques for micropropagating, cryopreserving, and outplanting Cumberland sandwort have been developed and successfully applied to establish an introduced population at DBNF (Pence *et al.* 2011, entire), which is not counted among the 71 extant occurrences discussed above. This introduced population has grown from an initial outplanting of 63 individuals to 255 individuals, representing multiple life stages, as of 2017 (Taylor 2018, pers. comm.). Eight years after initial outplanting, the genetic variation in this population, which was established in 2005 from seven genetic lines, was approaching levels of genetic diversity comparable to the source population (Philpott *et al.* 2014, entire). The Missouri Botanical Garden (MBG) has seeds in storage from BSF and PSP that were collected in 1991, 1994, 2005, and 2014 (Dell 2018, pers. comm.). Collections were made at multiple points in time to maintain seed viability in storage. While a cultivated source of plants is not currently maintained *ex situ*, the need for doing so is mitigated by the development of methods to micropropagate the species from cuttings and by availability of seeds in *ex situ* collections, providing two potential methods for propagating the species should it become necessary to do so.

Available data support the determination that Cumberland sandwort is not likely to become endangered in the foreseeable future due to limited distribution or small population sizes.

Effects of Climate Change

Our analyses under the Act include consideration of ongoing and projected changes in climate. The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). The term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2014, pp. 119–120). A recent compilation of climate change and its effects is available from reports of the IPCC (IPCC 2014, entire).

The IPCC concluded that evidence of warming of the climate system is unequivocal (IPCC 2014, pp. 2, 40). Numerous long-term climate changes have been observed including changes in arctic temperatures and ice, widespread changes in precipitation amounts, changes in ocean salinity, and aspects of extreme weather including heavy precipitation and heat waves (IPCC 2014, pp. 40–44). Since 1970, the average annual temperature across the Southeast has increased by about 2 degrees Fahrenheit (°F), with the greatest increases occurring during winter months. The geographic extent of areas in the Southeast region affected by moderate to severe spring and summer drought has increased over the past three decades by 12 and 14 percent, respectively (Karl *et al.* 2009, p. 111). These trends are expected to increase. Rates of warming are predicted to more than double in comparison to what the Southeast has experienced since 1975, with the greatest increases projected for summer months. Depending on the emissions scenario used for modeling change (IPCC 2000, entire), average temperatures are expected to increase by 2.5 degrees Celsius (°C) (4.5 °F) (scenario B1) to 5 °C (9 °F) (scenario A2) by the 2080s (Karl *et al.* 2009, p. 111). While there is considerable variability in rainfall predictions throughout the region, increases in evaporation of moisture from soils and loss of water by plants in response to warmer

temperatures are expected to contribute to increased frequency, intensity, and duration of drought events (Karl *et al.* 2009, p. 112).

We used the National Climate Change Viewer (NCCV), a climate-visualization tool developed by the U.S. Geological Survey (USGS), to generate future climate projections across the range of Cumberland sandwort. The NCCV is a web-based tool for visualizing projected changes in climate and water balance at watershed, State, and county scales (USGS 2017). This tool uses air temperature and precipitation data from 30 downscaled climate models for two Representative Concentration Pathway (RCP) scenarios, RCP 4.5 and RCP 8.5, as input to a simple water-balance model to simulate changes in the surface water balance over historical and future time periods, providing insight into potential for climate-driven changes in water resources. To evaluate the maximum effects of climate change in the future, we used projections from RCP 8.5, which is the most aggressive emissions scenario wherein greenhouse gases (GHGs) rise unchecked through the end of the century, to characterize projected future changes in climate and water resources, averaged across the five counties encompassing the range of Cumberland sandwort. The projections estimate change in mean annual values, comparing the period 1981 through 2010 with 2050 through 2074, for maximum and minimum temperature, monthly precipitation and runoff, snowfall, soil water storage, and evaporative deficit.

Within the range of Cumberland sandwort, the NCCV projects that, under the more extreme RCP 8.5 scenario, maximum temperature will increase by 3.2 °C (5.7 °F), minimum temperature will increase by 3.1 °C (5.6 °F), precipitation will increase by 5.36 mm (0.2 in) per month, soil water storage will decrease by 12.2 mm (0.5 in) annually, and evaporative deficit will increase by 4.6 mm (0.2 in) per month. Projected changes in snowfall are negligible. These estimates indicate that, despite projected minimal increases in annual precipitation, anticipated increases in maximum and minimum

temperatures will offset those gains, leading to a net loss in projected runoff and soil water storage. The most notable change with respect to water balance between the two time periods is that soil storage projections are projected to be significantly reduced during the months of June through November for the period 2050 through 2074. Based on these projections, Cumberland sandwort will on average be exposed to increased temperatures across its range, which, despite limited increases in precipitation, are expected to decrease soil water available during the growing season.

Assessments of vulnerability of federally listed plants in Tennessee to projected climate change have been conducted by two different groups (Glick *et al.* 2015, entire; Kwit 2018, pers. comm.) using version 2.1 of NatureServe's Climate Change Vulnerability Index (CCVI) (Young *et al.* 2015, entire). The CCVI is an assessment tool that combines results of downscaled climate predictions, characterizing direct exposure to projected climate change, with readily available information about a species' natural history, distribution, and landscape circumstances, which together influence sensitivity to change, to predict whether it will likely suffer a range contraction and/or population reductions due to the effects of climate change. For these assessments using the CCVI, climate change projections were based on ensemble climate predictions, representing a median of 16 major global circulation models and using a "middle of the road" scenario (i.e., emission scenario A1B of the IPCC (IPCC 2000, entire)) for GHG emissions (Young *et al.* 2015, p. 14) instead of the more extreme scenario that we used in the NCCV to project the climate and water balance changes reported above. From these two assessments, Cumberland sandwort was ranked as either "presumed stable" (Glick *et al.* 2015, p. 40) or "moderately vulnerable" (Kwit 2018, pers. comm.), the latter indicating the species' abundance and/or range extent within the geographical area assessed would likely decrease by 2050 (Young *et al.* 2015, p. 45).

The disparate results between these two assessments conducted using the same tool illustrate that there is some subjectivity involved in evaluating aspects of a species' biology and ecology as they relate to CCVI sensitivity factors used to model potential vulnerability to projected climate change. In the case of Cumberland sandwort, differing judgements of the species' physiological dependence on specific thermal and hydrological niches, restriction to uncommon geological features, and potential for phenological response to changing climate resulted in different outcomes with respect to predicted vulnerability to climate change. In the assessment that ranked Cumberland sandwort as moderately vulnerable, each of these factors were individually ranked as being more likely to increase the species' overall vulnerability than in the contrasting assessment that produced a rank of presumed stable.

Despite having produced different vulnerability ranks, both assessments ranked Cumberland sandwort among the least vulnerable to projected climate change of the federally listed plant species evaluated in Tennessee (Glick *et al.* 2015, p. 40; Kwit 2018, pers. comm.). While the rank of moderately vulnerable indicates that Cumberland sandwort would likely decrease in abundance and/or range extent by 2050, neither assessment using the CCVI predicted that the species would decrease significantly in abundance and/or range extent. Factors contributing to potential resilience of the species to projected climate change include the topographic complexity of the landscape it occupies, general lack of fragmentation among habitats where the species occurs, high abundance at some occurrences, and the fact that most occurrences are located on conservation lands where known threats can be monitored and managed.

Evidence of Cumberland sandwort's potential resilience to the threat of increased drought frequency and intensity is provided by examining available monitoring data in relation to drought records available from 2000 through present. We acquired data from the U.S. Drought Monitor (USDM) summarizing the number of weeks that the

geographic area where Cumberland sandwort occurs experienced "extreme" or "exceptional" droughts for periods of more than 2 consecutive weeks (USDM 2019). Since 2000, the four Tennessee counties, where all but one Cumberland sandwort occurrence are located, have experienced periods of such drought during 2007, 2008, and 2016. Prolonged drought conditions began during the last half of June 2007, and extended into late winter or spring of 2008, depending on the county. "Extreme" or "exceptional" drought conditions in these counties started again sometime between August and October 2008, ending in early December. During June 2007 through the end of 2008, these counties experienced between 26 and 53 cumulative weeks of "extreme" or "exceptional" drought conditions for periods that lasted 2 or more consecutive weeks. These counties did not experience such drought conditions again until a 3-week period during November 2016.

To determine whether any population declines recorded through monitoring corresponded with documented periods of local drought, we examined available data (TNHID 2018) for all sites where monitoring has encompassed the two drought periods discussed above. There were 20 occurrences with data spanning this time range, only one (Tennessee EO 7) of which was judged to have declined. More than 450 plants were estimated to have been present at this site in November 2007, and 351 plants were counted at the site in September 2017. Cumberland sandwort was estimated to have occupied approximately 4 m^2 of habitat in both years. This site's medium rank for abundance did not change over this time period. The other 19 sites remained stable over the time period encompassing the drought conditions discussed above, with the exception of three that increased. Available monitoring data, when considered in conjunction with data documenting droughts of extreme or exceptional severity within the range of Cumberland sandwort, indicate that the species is resilient to this climate phenomenon. Small populations are likely the most vulnerable to reductions or loss due to climate

change. Monitoring data spanning the time period of the droughts discussed above were available for three occurrences with fewer than 100 individuals or that were less than 1 m^2 in size, all of which remained stable. Thus, we conclude that climate change will not pose a threat to the viability of the species into the foreseeable future.

Cumulative Effects

The stressors discussed in the analysis above could work in concert with each other and result in a cumulative adverse effect to Cumberland sandwort; that is, one stressor may make the species more vulnerable to other threats. For example, stressors discussed under Factor A that individually do not rise to the level of a threat could together result in habitat degradation or loss. In instances where multiple habitat stressors act in concert with small population sizes, occurrences might lack resilience needed for population stability or growth. However, the potential stressors we identified either have not occurred to the extent originally anticipated at the time of listing, or appear to be either well-tolerated by the species or adequately managed as described in this final rule to delist the species. Our analysis has identified no rangewide threats or stressors with significant effects to all occurrences. We characterized the presence and relative severity of threats resulting from disturbances of substrates or altered forest conditions. Only 7 of the 71 extant occurrences were found to be potentially exposed to both substrate disturbance and altered forest condition. For reasons discussed below in *Inadequacy of Existing Regulatory Mechanisms*, we do not anticipate stressors to increase on conservation lands where nearly all of the occurrences are located. Furthermore, the increases documented in the number and size of many occurrences since the species was listed do not indicate that cumulative effects of various activities and stressors are affecting the viability of the species at this time or into the future.

Existing Regulatory Mechanisms

The Commonwealth of Kentucky and the State of Tennessee both list Cumberland sandwort as an endangered species. Conservation efforts are directed towards such species by the Office of Kentucky Nature Preserves (OKNP, formerly KSNPC) and TDEC, using funding and authorities provided through cooperative agreements with the Service under section 6 of the Act for endangered species recovery. When Cumberland sandwort is delisted (see **DATES**, above), these agencies will no longer receive such funding specifically for Cumberland sandwort conservation efforts, but could allocate a portion of overall funds they receive for post-delisting monitoring of the species.

The Kentucky Rare Plants Recognition Act, Kentucky Revised Statutes (KRS), chapter 146, sections 600–619, directs the OKNP to identify plants native to Kentucky that are in danger of extirpation within Kentucky and report every 4 years to the Governor and General Assembly on the conditions and needs of these endangered or threatened plants. The list of endangered or threatened plants in Kentucky is found in the Kentucky Administrative Regulations, title 400, chapter 3:040. The statute also recognizes the need to develop and maintain information regarding distribution, population, habitat needs, limiting factors, other biological data, and requirements for the survival of plants native to Kentucky. However, this statute does not include any regulatory prohibitions of activities or direct protections for any species included in the list. It is expressly stated in KRS 146.615 that this list of endangered or threatened plants shall not obstruct or hinder any development or use of public or private land. Furthermore, the intent of this statute is not to ameliorate the threats identified for the species, but to provide information on the species.

The Tennessee Rare Plant Protection and Conservation Act of 1985 (see Tennessee Code, title 70, chapter 8, part 3) authorizes the TDEC to, among other things,

conduct investigations on species of rare plants throughout the State of Tennessee; maintain a listing of species of plants determined to be endangered, threatened, or of special concern within the State; and regulate the sale or export of endangered species via a licensing system. This statute forbids persons from knowingly uprooting, digging, taking, removing, damaging, destroying, possessing, or otherwise disturbing for any purpose, any endangered species from private or public lands without the written permission of the landowner, lessee, or other person entitled to possession and prescribes penalties for violations. The TDEC may use the list of threatened and special concern species when commenting on proposed public works projects in Tennessee, and the department shall encourage voluntary efforts to prevent the plants on this list from becoming endangered species. It may not, however, be used to interfere with, delay, or impede any public works project.

Cumberland sandwort listing under these State laws may continue following Federal delisting, although Federal delisting may prompt changes in the species' status in Kentucky or Tennessee. However, we are unaware of any planned changes to State protections at this time.

Cumberland sandwort habitats on both State and Federal conservation lands will remain protected by rules, regulations, or plans governing the establishment or management of those lands, relevant sections of which are summarized below. As noted above in Table 2, 66 of the 71 extant Cumberland sandwort occurrences are located on Federal or State conservation lands at BSF, PSF, PCNA, and PSP.

Establishment of the BSF was authorized by section 108 of the Water Resources Development Act of 1974 (Pub. L. 93–251, March 7, 1974). The NPS manages the 125,000-acre (ac) BSF according to prescriptions established for eight management zones in Alternative D of the Final General Management Plan/Environmental Impact Statement for Big South Fork National River and Recreation Area, Kentucky and Tennessee (NPS

2005, entire). Under this management framework, habitats occupied by Cumberland sandwort and those that are potentially suitable for the species fall within the Sensitive Resource Protection Zone, which is managed to reflect natural processes and for careful protection from unnatural degradation (NPS 2005, pp. 31–40). As a result, this designation provides adequate protection to the 27 occurences within the BSF.

The 20,887-ac PSF was established in 1935, on lands donated to the State of Tennessee by Stearns Coal and Lumber Company (Tennessee Department of Agriculture 2019). The rules of the Tennessee Department of Agriculture Division of Forestry (Tennessee Administrative Code (TAC), chapter 0080–7–1, Protection of State Forests) prohibit destruction or damaging of any natural resource or collection of plants or botanical specimens, unless authorized by permit from the district forester. Pickett Civilian Conservation Corps (CCC) Memorial State Park is situated within the PSF, but as a State park is managed under separate rules from the State forest lands surrounding it. The rules of the Tennessee Department of Environment and Conservation (TAC, chapter 0400–02–02, Public Use and Recreation) prohibit users of State parks from destroying, digging, cutting, removing, or possessing any tree, shrub, or other plant, except as permitted by the Assistant Commissioner of Parks and Recreation (see TAC 0400-02-02-.18). Permits may only be issued for scientific or educational purposes (see TAC 0400-02-02-.23). The 3,000-ac PCNA is contiguous to PSF and very near PSP, the latter of which provides local management of the natural area, albeit according to more protective regulations applicable to designated State natural areas. The Tennessee Natural Areas Preservation Act of 1971 forbids the unauthorized removal or destruction of any rare, threatened, or endangered species of plants in any natural areas, with civil penalties of up to $10,000 per day for each day during which the prohibited act occurs (see Tennessee Code, title 11, chapter 14, part 1, section 11–14–115). Thus, we do not anticipate stressors to increase on conservation lands where nearly all of the occurrences are

located. For the reasons discussed above, we conclude that regulatory mechanisms are adequate to address threats that could result in habitat loss or curtailment of the species range into the foreseeable future.

Determination of Cumberland Sandwort'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 endangered species or 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 "endangered species" or "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 section 4(a)(1) factors, and considering the comments we received, we have found that since listing under the Act, Cumberland sandwort representation has increased with the discovery of occurrences in the Obey River watershed. Redundancy also has increased from 11 occurrences at the time of listing to 71 occurrences known to be extant, including 25 of the 28 occurrences that were included in the species recovery plan (Service 1996, pp. 6–8). An assessment of resiliency of these occurrences, taking into account estimated abundance, substrate condition, and forest condition, indicates that 57 occurrences ranked medium or higher, which we consider to be resilient. Of these

resilient occurrences, 42 meeting and exceeding recovery criteria because they are self-sustaining and located on protected land. Of the 15 resilient occurrences that are not counted towards meeting recovery criteria, 10 are located on protected lands but lack a sufficient number of observations over time to judge trends in their abundance and evaluate whether they are self-sustaining; thus, we expect they will also contribute to the species' overall resiliency and redundancy, ensuring its ability to withstand future catastrophic events (but we are not relying upon these 10 to make this final determination). Because Cumberland sandwort has increased in representation and redundancy, generally, and in particular with respect to numbers of resilient, self-sustaining, and protected occurrences, we have determined that the species is currently viable and expect this species to be viable into the foreseeable future.

We have carefully assessed the best scientific and commercial information available regarding the threats faced by Cumberland sandwort in developing the April 27, 2020, proposed rule (85 FR 23302) and this final rule. Threats reported at the time of listing related to habitat loss and curtailment of range (Factor A) have been managed in many locations, and available data indicate the species possesses greater resilience to effects of substrate disturbance from trampling and various activities and to effects of timber harvesting in nearby areas than was determined at the time of listing. We have analyzed or evaluated potential effects of climate change and low population size (Factor E) and determined that they are not significant threats to the species now nor are they likely to be in the foreseeable future (as defined above). Although the Cumberland sandwort will no longer receive the protections of the Act once it is delisted (see **DATES**, above), the remaining regulatory mechansims (Factor D) are adequate to protect Cumberland sandwort from threats to its habitat, given the fact that 66 of the 71 extant occurrences are located on Federal or State conservation lands. Considering the effect of current and future stressors to the species, and taking into account applicable

conservation measures and the existing regulatory mechanisms, the species is not currently in danger of extinction, nor is it likely to become so in 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 in the foreseeable future throughout all or a significant portion of its range. Having determined that Cumberland sandwort is not in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we now consider whether it may be in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range—that is, whether there is any portion of the species' range for which it is true that both (1) the portion is significant; and (2) the species is in danger of extinction now or likely to become so in 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 Cumberland sandwort, we choose to address the status question first—we consider information pertaining to the geographic distribution of both the species and the threats that the species faces to identify any portions of the range where the species is endangered or threatened. For Cumberland sandwort, we considered whether the threats are geographically concentrated in any portion of the species' range at a biologically meaningful scale. We examined the following threats: habitat modification and curtailment of range, including cumulative effects.

The range of Cumberland sandwort is restricted to a small geographic area in portions of five counties, with high similarity in geological and ecological conditions

among occupied sites. Within this geographic area, the species is known from two watersheds, South Fork Cumberland and Obey River, where there are 59 and 12 extant occurrences, respectively. Therefore, applying the process described above, we first evaluated the status of Cumberland sandwort to determine if any threats or population declines were concentrated in any specific portion of the range. Threats related to habitat modification or curtailment of range primarily affect occurrences in the South Fork Cumberland drainage. Our analysis of the species' resilience (see above, **Recovery**), which integrated information on abundance and threats, determined that 45 of the occurrences within the South Fork Cumberland and all of the occurrences within the Obey River drainages had resiliency indices of medium or higher. We have determined that 40 of these resilient occurrences in the South Fork Cumberland and 2 in the Obey River drainages are protected and contribute towards achieving the recovery criteria. The presence of 40 protected and self-sustaining occurrences in the South Fork Cumberland indicates that threats are not concentrated in this drainage so as to affect the representation, redundancy, or resiliency of Cumberland sandwort. Nine protected occurrences in the Obey River watershed have resiliency indices of medium or higher, but lack sufficient monitoring data to evaluate trends in abundance and determine whether they are self-sustaining. Due to their locations on protected lands, primarily within PCNA where proposed trail routes are surveyed to minimize adverse effects to Cumberland sandwort (TDEC no date, pp. 10–11), we expect that these nine occurrences will remain stable for the foreseeable future, adding to the resilience, representation, and redundancy afforded by the 42 occurrences currently considered to contribute to achieving recovery criteria. Based on the distribution of 42 protected and self-sustaining occurrences among the two watersheds, all located on conservation lands managed according to rules, regulations, or management plans (NPS 2005, pp. 31–39; TDEC no date, entire) that protect Cumberland sandwort, we have determined that threats related to

habitat modification or curtailment of range are not concentrated in any portion of the species' range so as to affect its representation, redundancy, or resiliency.

We found no concentration of threats in any portion of Cumberland sandwort's range at a biologically meaningful scale. Therefore, no portion of the species' range can provide a basis for determining that the species is in danger of extinction now or likely to become so in the foreseeable future in a significant portion of its range, and we find the species is not in danger of extinction now or likely to become so in the foreseeable future in any significant portion of its range. This is consistent with the courts' holdings in *Desert Survivors* v. *Department of the Interior*, No. 16-cv-01165-JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018), and *Center for Biological Diversity* v. *Jewell*, 248 F. Supp. 3d, 946, 959 (D. Ariz. 2017).

Determination of Status

Our review of the best available scientific and commercial information indicates that Cumberland sandwort is not in danger of extinction nor likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Therefore, we find that Cumberland sandwort 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. Therefore, we are removing the species from the List of Endangered and Threatened Plants.

Effects of This Rule

This final rule revises 50 CFR 17.12(h) to remove Cumberland sandwort from the Federal List of Endangered and Threatened Plants. The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, will no longer apply to Cumberland sandwort. Federal agencies will no longer be required to consult with us under section 7 of the Act in the event that activities they authorize, fund, or carry out

may affect Cumberland sandwort. There is no critical habitat designated for Cumberland sandwort; therefore, this rule does not affect 50 CFR 17.96.

This rule will not affect Cumberland sandwort's status as an endangered or threatened species under State laws or suspend any other legal protections provided by those laws. States may have more restrictive laws protecting wildlife and plants, and these will not be affected by this Federal action. However, this final rule may prompt either Kentucky or Tennessee to remove protection for Cumberland sandwort under their endangered species laws, although we are not aware of any such intention at this time.

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 delisted due to recovery. 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. At the conclusion of the monitoring period, we will review all available information to determine if re-listing, the continuation of monitoring, or the termination of monitoring is appropriate.

Section 4(g) of the Act explicitly requires that we cooperate with the States in development and implementation of PDM programs. However, we remain ultimately responsible for compliance with section 4(g) and, therefore, must remain actively engaged in all phases of PDM. We also seek active participation of other entities that are expected to assume responsibilities for the species' conservation after delisting.

We prepared a PDM plan for Cumberland sandwort (Service 2020). The plan describes:

(1) The Cumberland sandwort's condition at the time of delisting;

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

(3) Frequency and duration of monitoring;

(4) Monitoring methods, including sampling considerations;

(5) Data compilation and reporting procedures and responsibilities; and

(6) A proposed PDM implementation schedule, including timing and responsible parties.

It is our intent to work with our partners to maintain the recovered status of the Cumberland sandwort.

Required Determinations

National Environmental Policy Act

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

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994, "Government-to-Government Relations with Native American Tribal Governments" (59 FR 22951), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities,

and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We have determined that no Tribes will be affected by this rule because no Tribal lands, sacred sites, or resources will be affected by the removal of Cumberland sandwort from the List of Endangered and Threatened Plants.

References Cited

A complete list of references cited is available at *http://www.regulations.gov* under Docket Number FWS–R4–ES–2019–0080, or upon request from the Tennessee Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Author

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

List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as 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; 4201–4245, unless otherwise noted.

§ 17.12 [Amended]

2. Amend § 17.12 in paragraph (h) by removing the entry for "*Arenaria cumberlandensis*" under "FLOWERING PLANTS" from the List of Endangered and Threatened Plants.

Martha Williams
Principal Deputy Director,
Exercising the Delegated Authority of the Director,
U.S. Fish and Wildlife Service.

[FR Doc. 2021-17468 Filed: 8/13/2021 8:45 am; Publication Date: 8/16/2021]