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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R6-ES-2022-0093; FF09E22000 FXES1113090FEDR 223]

RIN 1018–BG56

Endangered and Threatened Wildlife and Plants; Removal of the Colorado Hookless Cactus From the Federal List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

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

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to remove the Colorado hookless cactus (*Sclerocactus glaucus*) from the Federal List of Endangered and Threatened Plants (List) due to recovery. Recent taxonomic studies have indicated that the currently listed entity is actually two species: *Sclerocactus glaucus* and *Sclerocactus dawsonii*. We find that neither species should be listed as a threatened or endangered species under the Endangered Species Act of 1973, as amended (Act). Our review of the best available scientific and commercial data indicates that the threats to the species have been eliminated or reduced to the point that these species no longer meet the definition of a threatened or endangered species under the Act. We request information and comments from the public regarding this proposed rule and the draft post-delisting monitoring (PDM) plan for Colorado hookless cactus (*S. glaucus* and *S. dawsonii*). If this proposal is finalized, Colorado hookless cactus will be removed from the List and the prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, will no longer apply to the species.

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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

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

(1) *Electronically*: Go to the Federal eRulemaking Portal: *https://www.regulations.gov*. In the Search box, enter FWS-R6-ES-2022-0093, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on "Comment."

(2) *By hard copy*: Submit by U.S. mail to: Public Comments Processing, Attn: FWS-R6-ES-2022-0093, U.S. Fish and Wildlife Service, MS: PRB/3W; 5275 Leesburg Pike, Falls Church, VA 22041–3803.

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

Availability of supporting materials: This proposed rule and supporting documents, including the species status assessment (SSA) report and post-delisting monitoring plan, are available at *https://fws.gov/species/colorado-hookless-cactus-sclerocactus-glaucus*, at *https://www.regulations.gov* under Docket No. FWS-R6-ES-2022-0093, and at the Colorado Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

FOR FURTHER INFORMATION CONTACT: Creed Clayton, Acting Western

Colorado Field Supervisor, U.S. Fish and Wildlife Service, Colorado Ecological Services Office, 445 West Gunnison Ave, Suite 240, Grand Junction, CO 81501; telephone 970–628–7187. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species warrants removal from the Federal Lists of Endangered and Threatened Wildlife and Plants if it no longer meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a threatened species (likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range). The Colorado hookless cactus is listed as threatened, and we are proposing to remove (delist) it from the List of Endangered and Threatened Plants because we have determined it does not meet the Act's definition of an endangered or threatened species. Delisting a species can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process (5 U.S.C. 551 et seq.).

What this document does. This action proposes to remove Colorado hookless cactus from the List of Endangered and Threatened Plants (i.e., "delist" the species) based on its recovery.

The basis for our action. Under the Act, we may determine that a species is an endangered species or a threatened species based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C)

disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. The determination to delist a species must be based on an analysis of the same factors.

Under the Act, we must review the status of all listed species at least once every five years. We must delist a species if we determine, on the basis of the best available scientific and commercial data, that the species is neither a threatened species nor an endangered species. Our regulations at 50 CFR 424.11 identify three reasons why we might determine that a listed species is neither an endangered species nor a threatened species: (1) The species is extinct; (2) the species has recovered, or (3) the original data used at the time the species was classified were in error. Here, we have determined that Colorado hookless cactus should be proposed for delisting under the Act because, based on an analysis of the five listing factors, it has recovered and no longer meets the definition of an endangered or threatened species.

Information Requested

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

We particularly seek comments concerning:

(1) Reasons we should or should not delist the Colorado hookless cactus.

(2) New information on the historical and current status, range, distribution, and population size of the Colorado hookless cactus.

(3) New information on the known and potential threats to the Colorado hookless cactus, including livestock use, invasive species, oil and gas development, off-highway vehicle use, development and maintenance of utility corridors, and climate change.

(4) New information regarding the taxonomy, life history, ecology, and habitat use of the Colorado hookless cactus.

(5) Current or planned activities within the geographic range of the Colorado hookless cactus that may have either a negative or positive impact on the species.

(6) Information regarding management plans or other mechanisms that provide protection to the Colorado hookless cactus and its habitat.

(7) The draft PDM plan and the methods and approach described.

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

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

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

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

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *https://www.regulations.gov*.

Because we will consider all comments and information we receive during the comment period, our final determinations may differ from this proposal. Based on the new information we receive (and any comments on that new information), we may conclude that the species should remain listed as threatened instead of being delisted, or we may conclude that the species should be reclassified from threatened to endangered.

Public Hearing

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

Peer Review

A species status assessment (SSA) team prepared an SSA report for the Colorado hookless cactus to inform the 2021 5-year review and updated it in 2022. The SSA team was composed of Service biologists who consulted with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species.

In accordance with our July 1, 1994, peer review policy (59 FR 34270; July 1,

1994) and our August 22, 2016, Director's Memo on the Peer Review Process, we solicited independent scientific reviews of the information contained in the Colorado hookless cactus SSA report. We sent the SSA report to five independent and appropriate peer reviewers and received three responses. Results of this structured peer review process can be found at *https://regulations.gov*. In preparing this proposed rule, we incorporated the results of these reviews, as appropriate, into the final SSA report, which is the foundation for this proposed rule.

Summary of Peer Reviewer Comments

As discussed in *Peer Review* above, we received comments from three peer reviewers on the draft SSA report. We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the information contained in the SSA report. In some cases, these reviewers provided additional information, clarifications, and suggestions to improve the final SSA report. The reviewers also provided new references or corrected existing references we cited in our SSA report; we revised or included relevant references, as appropriate. We summarize the additional substantive feedback we received from peer reviewers below.

Comment 1: One reviewer commented on our range and analytical units (AU) maps that some cactus occurrences were not included in AUs.

Our Response: The maps in the SSA do not depict each individual plant occurrence included in the AUs; however, our AUs contain all records of known occurrences.

Comment 2: One reviewer asked why recreational trails for mountain bikes, hiking, camping and other recreational uses were discussed as a stressor, but were not included in our table summarizing stressors in the SSA.

Our Response: Recreational uses other than OHV use have the potential to cause direct impacts to individuals; however, due to their relatively small footprint, the BLM's

ability to largely avoid Colorado hookless cactus when designing non-motorized trail routes, and the rarity of humans trampling cacti, we believe that these localized impacts to individuals do not present species or AU-level effects. Therefore, we did not further consider this stressor (i.e., non-motorized recreation) in our analysis, so they are not discussed in tables summarizing stressors in the SSA.

Comment 3: One reviewer shared that recent genetic research found that a closely related species, *S. parviflorus*, occurs on the western edge of *S. glaucus*' range and is capable of hybridizing.

Our Response: Hybridization with other *Sclerocactus* species in Colorado was not found to be recent or ongoing, and thus is not a conservation concern for *S. dawsonii* or *S. glaucus* (McGlaughlin and Naibauer 2021, p. 22). We therefore do not include this stressor in our analysis of species' current of future condition in the SSA.

Comment 4: One reviewer commented that pollinators were only briefly discussed in the SSA and they requested a more in-depth discussion on which pollinators are important for the species.

Our Response: The purpose of the SSA is to gather and compile information on the status of these species in order to assess their current condition and project the species' future condition. Adding a detailed inventory of known pollinators is not necessary to assess the current and future conditions for these species in the SSA report, because pollinators of *Sclerocactus* species are adequately discussed in other papers (see BLM 2020a, pp. 17–18, Tepedino et al. 2010, pp. 382–383). Over 100 species have been documented visiting *Sclerocactus* species (BLM 2020a, p. 17). As we summarize in the SSA, there is no information to indicate that Colorado hookless cactus species require specialist pollinators (Service 2022, pp. 11–12). Moreover, the majority of pollinator species one researcher observed visiting *Sclerocactus* plants are generalists themselves; these bee species visit a wide variety of flowers and only require a general diversity and

abundance of native flowers in the environment (Tepedino et al. 2010, pp. 382–383).

Comment 5: One reviewer stated that the patterns of genetic diversity for each species were unclear in the SSA report. This reviewer questioned how the AUs are genetically connected and whether *S. dawsonii* exhibits genetic connectivity. Another reviewer similarly suggested that, while genetic variability is described as being important for the species, information about genetic variability within the species is missing from the SSA.

Our Response: In the SSA, we discuss the relevant information on genetic diversity of both species, summarizing more detailed information contained in a report of recent genetic analyses (Service 2022, pp. 10, 25; McGlaughlin and Naibauer 2021, entire). These analyses indicate that genetic diversity is low to moderate, with limited evidence of inbreeding for both species (McGlaughlin and Naibauer 2021, p. 22). *S. glaucus* demonstrates sufficient connectivity, which results in ongoing and recent genetic exchange (McGlaughlin and Naibauer 2021, p. 2). *S. dawsonii* is genetically isolated from *S. glaucus*, but individuals are connected within and between the species' AUs (McGlaughlin and Naibauer 2021, p. 22). More detail on the specific patterns of genetic variability in both species is available in McGlaughlin and Naibauer (2021, entire).

Comment 6: One reviewer commented that the methods from the novel sampling-based procedure, which BLM used to derive population estimates, were not described in detail.

Our Response: As we discuss above, the purpose of the SSA is to gather and compile information on the status of this species in order to assess its current condition and project the species' future condition. Adding detailed information on the monitoring methodologies our partners use is not necessary to assess the current and future conditions for this species in the SSA report, because these methods are adequately described in other resources. More details on monitoring methods are available in

Krening et al. (2021, entire), which provides an in-depth explanation of the sampling-based monitoring procedure. We briefly summarize the methods of the sampling-based monitoring procedure in the SSA (Service 2022, p. 13).

Comment 7: One reviewer asked how many occurrences of each cactus species occur on Federal lands as opposed to private lands. The reviewer also requested clarification to the statement that occurrences on some Federal lands "are not likely to be disturbed or adversely altered by land-use actions."

Our Response: Due to the methodology that BLM uses to extrapolate the number of occurrences in a given AU based on plant density (see Krening et al. 2021, entire), the best available science on plant occurrences does not indicate the specific number of plants that occur on public rather than private lands. Therefore, we could not add the breakdown of cactus occurrences this reviewer requested to the SSA, given the lack of this specific distribution information. However, we report in the SSA the proportion of land area in each AU that is Federally owned and managed (Service 2022, p. 21). The majority of lands within both Colorado hookless cactus species' ranges are Federally owned and managed and a subset of these Federal lands have special BLM land management designations (e.g., National Conservation Areas (NCA), Areas of Critical Environmental Concerns (ACEC), and a wilderness area over which BLM has authority). These areas with special land management designations help to facilitate the maintenance and recovery of cactus occurrences given that they are areas where Colorado hookless cactus occurrences are not likely to be disturbed or adversely altered by land-use actions (BLM 2020a p. 26). As we explain in Table 6 of the SSA, these areas may provide no-surface-occupancy stipulations (which prevent oil and gas development), may prohibit the use of motorized recreational vehicles, and may prohibit livestock grazing (Service 2022, pp. 18–21). While we did not add more detail to the SSA to further describe these conservation efforts in response to this comment (beyond the list of conservation

practices specific to each NCA, ACEC, or wilderness area already provided in Table 6 of the SSA) (Service 2022, pp. 18–21), we further clarify and describe how these areas promote conservation of the species under *Stressors* and *Conservation Efforts and Regulatory Mechanisms* in this proposed rule below.

Comment 8: One reviewer questioned why the stressors of predation, herbicide/pesticide application, and commercial trade were excluded from the analysis; they noted that we did not provide supporting reasons or evidence for why these stressors do not present AU-level or species-level effects besides "the best professional judgement of species experts."

Our Response: Small mammals may predate individual plants and, while this does present a source of mortality, we do not have any evidence to indicate that predation is having lasting, population-level effects for the species (Service 2022, pp. 17–18). The application of herbicides and pesticides on Federal lands is highly regulated; moreover, managers only apply these chemicals in targeted, isolated areas throughout the species' ranges (BLM 2020a, p. 45). Therefore, we did not find this stressor to present more than localized effects to individual plants. Additionally, collection from the wild has not occurred at the level anticipated at the time of listing; collection is not having population- or species-level effects on either species (BLM 2020a, p. 36). Therefore, these stressors do not have species or AU-level effects. Thus, we did not further analyze the effects of predation, herbicide and pesticide application, or collection and commercial trade in our SSA analyses of current and future conditions.

Comment 9: One reviewer commented that it would be useful to understand the background data being used to model habitat condition for these two species and what an "AIM/LMF sample point" is. The reviewer also asked which factors were used to assess habitat quality.

Our Response: BLM species and habitat experts analyzed habitat condition for

the two species, and detailed their methods and source data in Holsinger and Krening (2021, entire). They analyzed habitat quality using BLM Assessment, Inventory, and Monitoring (AIM) and Landscape Management Framework (LMF) data. AIM and LMF sample points are geographic locations distributed throughout the landscape to which BLM biologists return on a regular basis to collect data on environmental conditions and vegetation health (e.g., ground cover, grass height, weed cover). BLM experts used data from the 134 individual AIM/LMF sample points within the AUs for this analysis of habitat condition. Data from three separate indicators were used to evaluate habitat quality: invasive species cover, amount of bare ground, and native perennial cover.

Comment 10: One reviewer expressed surprise that there were no AUs with a low habitat condition score. However, this reviewer did not provide any information to suggest the scores should change.

Our Response: BLM experts developed a Habitat Condition Index to evaluate habitat condition (see response to Comment 9). This index produced a single habitat condition score from the aggregated rankings of three biologically relevant habitat condition categories: habitat quality, habitat size, and habitat type (Service 2022, pp. 43–44; Holsinger and Krening 2021, entire). The result of the Habitat Condition Index is a habitat condition score (high, moderate, or low) for each AU (Holsinger and Krening 2021, p. 2). Detailed information on the methods for this evaluation can be found in Holsinger and Krening (2021, entire). According to this analysis, in each AU, both species generally have the level of invasive species cover, bare ground, and native perennial cover they require (the three indicators that made up the "habitat quality" score). Only 4 of the 10 AUs received a low score for any of these three categories; however, the AUs that received a low score for these habitat quality categories were relatively large (i.e., they received high scores for the "habitat size" category) and had high probability of species' occurrence, according to the results of a predictive model for

Colorado hookless cactus (i.e., they received high scores for the "habitat type" category) (Holsinger and Krening 2021, entire). These high scores for the habitat size and habitat type categories balanced the lower scores for the habitat quality category, resulting in no AUs with a low score for overall habitat condition.

Previous Federal Actions

The Service listed *Sclerocactus glaucus* as threatened on October 11, 1979 (44 FR 58868). After its 1979 listing, the species underwent a series of taxonomic revisions. When listed, the range of *Sclerocactus glaucus* was considered to include western Colorado and northeastern Utah (Uinta Basin hookless cactus complex). A reevaluation of morphological characteristics, phylogenetic studies, and common garden experiments led to the determination that the Uinta Basin hookless cactus complex was in fact three distinct species: *Sclerocactus glaucus* (Colorado hookless cactus), *Sclerocactus brevispinus* (Pariette cactus), and *Sclerocactus wetlandicus* (Uinta Basin hookless cactus) (Heil and Porter 2004, pp. 197–207; Hochstätter 1993, pp. 82–92). *Sclerocactus glaucus* was determined to be restricted to the Colorado and Gunnison River basins in western Colorado, while *Sclerocactus brevispinus* and *Sclerocactus wetlandicus* are limited to the Uinta Basin in eastern Utah. In 2009, the Service published a final rule recognizing and accepting this revised taxonomy of the three species and determined that all three species would continue to be listed as threatened (74 FR 47112, September 15, 2009). The Service has not designated critical habitat for the Colorado hookless cactus (*Sclerocactus glaucus*). The species also lacks a recovery plan.

On January 21, 2021, we published a notice of initiation of a 5-year review for the Colorado hookless cactus in the *Federal Register* and requested information that could have a bearing on the status of Colorado hookless cactus (86 FR 2442). We completed the 5-year status review on August 10, 2021; this 5-year status review recommended (1) acknowledging that Colorado hookless cactus, as listed, is two taxonomically distinct

entities (*Sclerocactus glaucus* and *Sclerocactus dawsonii*) and (2) that neither *S. glaucus* nor *S. dawsonii* meet the definition of an endangered species or a threatened species under the Act. Therefore, the 5-year status review recommended removing *S. glaucus* from the list of threatened plants; it also recommended that *S. dawsonii* need not be listed as a threatened or endangered species under the Act.

Background

A thorough review of the taxonomy, life history, and ecology of the Colorado hookless cactus (*Sclerocactus glaucus* and *Sclerocactus dawsonii*) is presented in the SSA Report Version 1.1 (Service 2022, entire).

As discussed above under **Previous Federal Actions**, Colorado hookless cactus has undergone a series of taxonomic revisions since its original 1979 listing. Most recently, in 2017, genetic studies identified three distinct regional groups of Colorado hookless cactus in Colorado: the Northern, Grand Valley, and Gunnison River groups (Schwabe et al. 2015, p. 447; McGlaughlin and Ramp-Neale 2017, p. 5). The most recent genetic analyses, using Random Site-Associated DNA sequencing (RADseq), determined that the Northern group should be recognized as a distinct species, hereinafter *Sclerocactus dawsonii*, or *S. dawsonii* (McGlaughlin and Naibauer 2021, p. 3). The Grand Valley and Gunnison River groups share connectivity and form a genetically cohesive group, which represents a second distinct species, hereinafter collectively referred to as *Sclerocactus glaucus*, or *S. glaucus* (McGlaughlin and Naibauer 2021, p. 3). Because of the recency of this taxonomic split, the currently listed entity is still considered to be the Colorado hookless cactus, which encompasses both *S. glaucus* and *S. dawsonii*; thus, both *Sclerocactus glaucus* and *Sclerocactus dawsonii* are the subjects of our SSA report and this proposed delisting rule.

Given the recent nature of this new taxonomic information, most literature on the species draws conclusions regarding both *S. glaucus* and *S. dawsonii* without

distinguishing between the two. Thus, when we use the common name "Colorado hookless cactus" in this proposed rule, we are referring to information or conclusions regarding both species (*S. glaucus* and *S. dawsonii*). When we are referring to information or analysis pertaining to one species, we will use the new scientific names of *S. glaucus* or *S. dawsonii*.

S. glaucus and *S. dawsonii* are endemic cactus species found in the Colorado and Gunnison River basins and their tributary canyons in Garfield, Mesa, Montrose, and Delta Counties in western Colorado. The species occur on alluvial benches and colluvial slopes from 4,500 to 7,200 feet (1,372 to 2,195 meters) in semi-arid high-elevation desert (Holsinger 2021, pers. comm.; Service 2022, p. 9). The species display a patchy, generalist distribution and have been found to grow primarily in small, discrete colonies of individuals in various upland desert habitats and communities (BLM 2020a, p. 18; Service 2022, p. 9).

For the purposes of analysis in our SSA report, we divided the ranges of both species into analysis units (AUs). *S. glaucus* occurs in eight AUs in a range that extends approximately 1,082 square miles (mi^2) (2,802 square kilometers (km^2)) from the Grand Valley, through the high desert at the foot of the Grand Mesa, and along the alluvial terraces of the Gunnison River and the Dominguez and Escalante Creek drainages to near Montrose. *S. dawsonii* occurs over an area of approximately 195 mi^2 (505 km^2) in two AUs along the Colorado River from DeBeque downstream toward the Grand Valley and along the Roan and Plateau Creek drainages. BLM owns and manages approximately 72 percent and 68 percent, respectively, of the land that comprises *S. glaucus* and *S. dawsonii* AUs (Service 2022, pp. 18–21).

S. glaucus and *S. dawsonii* are morphologically indistinguishable from each other and can be identified from one another only by genetic analysis or location. They are both leafless, flowering, stem-succulent plants with short, cylindrical bodies usually 3 to 12

centimeters (cm) (1.2 to 4.8 inches (in)), but up to 30 cm (12 in), tall, and 4 to 9 cm (1.6 to 3.6 in) in diameter (Service 2022, pp. 7–8). The brown coloring of the spines on mature plants is unique to *S. glaucus, S. dawsonii*, and *S. parviflorus*, as compared to other cactus species in the area (Service 2022, p. 7).

Colorado hookless cactus has three life stages: seeds, seedlings, and mature reproductive adults. Colorado hookless cactus plants are considered hardy, long-lived perennial species (i.e., high survival probabilities and low levels of recruitment) (BLM 2018, p. 15). Based on high observed seedling survival, once a seedling is established, there is a high probability of an individual persisting to reproductive stage (BLM 2018, p. 14; Service 2022, p. 13). Pollinator-assisted outcrossing (xenogamy) is the primary mode of genetic exchange for the Colorado hookless cactus (Janeba 2009, p. 67; Tepedino et al. 2010, p. 382; Service 2022, p. 8). Plants usually flower in late April and early May. Plants do not flower until they reach a diameter of more than 4 cm (1.6 in) (BLM 2018, p. 14); plants are likely at least 4 to 6 years old before they become reproductive and continue to flower throughout their relatively long life (DePrenger-Levin 2021, pers. comm.; Service 2022, p. 13). Colorado hookless cactus can live for many years, but their exact longevity is unknown.

Regulatory and Analytical Framework

Regulatory Framework

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 is an endangered species or a threatened species. On July 5, 2022, the U.S. District Court for the Northern District of California vacated regulations that the Service (jointly with the National Marine Fisheries Service) promulgated in 2019 modifying how the Services add, remove, and reclassify threatened and endangered species and the criteria for designating listed species' critical habitat (*Center for Biological Diversity* v. *Haaland*, No. 4:19-cv-05206-

JST, Doc. 168 (*CBD* v. *Haaland*). As a result of that vacatur, regulations that were in effect before those 2019 regulations now govern species classification and critical habitat decisions. Subsequently, on September 21, 2022, the U.S. Circuit Court of Appeals for the Ninth Circuit stayed the district court's July 5, 2022, order vacating the 2019 regulations until a pending motion for reconsideration before the district court is resolved (In re: Cattlemen's Ass'n, No. 22-70194). The effect of the stay is that the 2019 regulations are the governing law as of September 21, 2022.

Our analysis for this proposal applied those 2019 regulations. However, given the continued uncertainty resulting from the ongoing litigation, we also undertook an analysis of whether this final rule would be different if we were to apply the pre-2019 regulations. We concluded that we would have reached the same proposal if we had applied the pre-2019 regulations because both before and after the 2019 regulations, the standard for whether a species warrants delisting has been, and will continue to be, whether the species meets the definition of an endangered species or a threatened species. Further, we concluded that our determination of the foreseeable future would be the same under the 2019 regulations as under the pre-2019 regulations. The analysis based on the pre-2019 regulations is included in the decision file for this proposal.

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

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

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

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

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

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

We use the term "threat" to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term "threat" includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term "threat" may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an "endangered species" or a "threatened species." In determining whether a species meets either definition, we must evaluate all identified threats by considering the species' expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing regulatory

mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an "endangered species" or a "threatened species" only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term "foreseeable future," which appears in the statutory definition of "threatened species." Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. 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 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 necessary to define the 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.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent our decision on whether the species should be proposed for delisting. However, it does provide the scientific basis that informs our regulatory decisions, which involve the

further application of standards within the Act and its implementing regulations and policies.

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

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated individual species' life-history needs. The next stage involved an assessment of the historical and current condition of the species' demographics and habitat characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species' responses to positive and negative environmental and anthropogenic influences. Throughout all of these stages, we used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We use this information to inform our regulatory decision.

The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket FWS-R6-ES-2022-0093 on

https://www.regulations.gov and at *https://fws.gov/species/colorado-hookless-cactus-sclerocactus-glaucus*.

Summary of Biological Status and Threats

In this section, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability. In addition, the SSA (Service 2022, entire) documents our comprehensive biological status review for the species, including an assessment of the potential threats to the species. The following is a summary of this status review and the best available information gathered since that time that has informed this decision.

Species Needs

Individuals of both species of Colorado hookless cactus need certain habitat factors, including: shallow exposed sandy or shale soils of sedimentary parent material or gravelly deposits of river alluvium; a semi-arid, high-elevation desert climate (elevations from 1,200–2,000 meters (m) (3,937–6,561 feet (ft))) with 20–30 cm (8–12 in) of rain per year; and a period of deep cold during winter months to facilitate germination the following spring (Service 2022, p. 11). To be sufficiently resilient, AUs of both species require survivorship and recruitment at rates that are able to sustain AUs, in addition to pollinator connectivity between individuals and clusters of plants within the AU. Adequately resilient AUs also contain enough individuals across each life stage (seed, seedling, and mature reproductive adult) to bounce back after experiencing environmental stressors such as intermediate disturbance, occasional drought, or intensive grazing.

The number of AUs across the landscape influence redundancy of Colorado hookless cactus. More AUs across the range of each species increase each species' ability to withstand catastrophic events. Individuals and AUs inhabiting diverse ecological

settings and exhibiting genetic or phenological variation add to the level of representation across the species' ranges. The greater diversity observed in Colorado hookless cactus genetics, habitats, and morphology, the more likely it is to be able to adapt to change over time. Both species, thus, need (1) a sufficient number and distribution of sufficiently resilient AUs to withstand catastrophic events (redundancy) and (2) a range of variation that allows the species to adapt to changing environmental conditions (representation) (Service 2022, p. 15). The SSA report provides additional detail on the species' individual-, population-, and species-level needs (Service 2022, pp. 10–16).

Stressors

In our SSA, we evaluated stressors and other actions that can positively or negatively affect Colorado hookless cactus at the individual, AU, or species levels, either currently or into the future (Service 2022, pp. 16–18). A wide variety of stressors may influence the resiliency of Colorado hookless cactus, either by directly affecting individuals or by reducing the quality and quantity of habitats.

Stressors that have the potential to present AU-level effects for both species include livestock use; invasive species; oil and gas development; OHV recreational use; development and maintenance of utility corridors; and the effects of global climate change (BLM 2020a, p. 30; Service 2022, pp. 16–18). We determined that predation, herbicide and pesticide application, or collection and commercial trade were not threats to the species (even though they were identified as such in the 1979 listing rule), so we do not discuss them in detail in this rule (Service 2022, pp. 16–18).

Additionally, approximately 30 percent of the land in *S. glaucus* AUs and 41 percent of the land in *S. dawsonii* AUs have special BLM land management designations in the form of National Conservation Areas (NCAs), Areas of Critical Environmental Concern (ACECs), and a Wilderness Area. These designations limit or exclude the authorization of certain land uses, and some designations were specifically created for the

conservation of natural resources. The protections provided by these management designations are not contingent upon the species' federally listed status, and these designations help to facilitate the maintenance and recovery of cactus occurrences because they are areas where Colorado hookless cactus is not likely to be disturbed or adversely altered by land-use actions (BLM 2020a, p. 26). All but 4 of 11 ACECs specifically referenced the protection of Colorado hookless cactus as a foundational goal. We discuss the specific protections each of these areas provides, and the ways in which they reduce specific stressors, under the relevant stressors below; we also discuss these conservation measures further under *Conservation Efforts and Regulatory Mechanisms*.

Livestock Use

BLM owns and manages approximately 72 percent and 68 percent, respectively, of the land that comprises *S. glaucus* and *S. dawsonii* AUs (Service 2022, pp. 18–21); nearly all habitat that occurs on BLM lands allows for livestock use. Moderate to heavy domestic livestock grazing has been observed to cause physical damage to *Sclerocactus* plants through trampling, but we have no evidence to indicate that cattle browse on individual *Sclerocactus* plants (Service 1990, p. 11). A study on another federally listed cactus, *S. wrightiae*, found that cacti density increased more rapidly in a fenced plot excluded from cattle grazing than in an unfenced plot with a reduced cattle stocking rate (Clark and Clark 2007, p. 21). Overgrazing (the continued heavy grazing beyond the recovery capacity of forage plants) by domestic livestock can have a negative impact on North American xeric ecosystems (Jones 2000, p. 158). For example, overgrazing can facilitate the establishment of invasive species like *Bromus tectorum*, known as cheatgrass (Masters and Sheley 2001, p. 503; DiTomaso et al. 2016, p. 435), which are difficult to eradicate and tend to outcompete native vegetation, including cacti.

Currently, BLM implements 15 nondiscretionary conservation measures to minimize or reduce the effects of grazing on the Colorado hookless cactus, which are

contained in a 2012 programmatic biological opinion (BLM 2020a, p. 41). BLM also manages livestock activities to protect sensitive plants in the Adobe Badlands, River Rims, and Escalante Canyon ACECs (BLM 2017, p. 240, p. 258; BLM 2020a, p. 28; Service 2022, pp. 19–20). In the Atwell Gulch ACEC, BLM excludes livestock grazing entirely on 2,600 ac (1,052 ha), and in the Pyramid Rock ACEC, no livestock grazing is allowed (BLM 2020a, p. 29; Service 2022, pp. 19–20). BLM's management plans allow it to include stipulations in its grazing permit renewals that require reductions in the number of livestock and adjustments to the timing, duration, and season of livestock use for the benefit of natural resources; such changes in grazing permits would primarily affect future grazing intensity in the Cactus Park (*S. glaucus*), Devil's Thumb (*S. glaucus*), Gunnison River East (*S. glaucus*), Roan Creek (*S. dawsonii*), and Plateau Creek AUs (*S. dawsonii*).

Currently, livestock use is affecting only individual plants; however, these effects could increase in the future if no corrective action is taken to address future problem areas. Thus, we included an analysis in the SSA to examine species' potential response to future changes in this stressor (Service 2022, pp. 18–21).

Invasive Species

Invasive weeds, including *Bromus tectorum* (cheatgrass) and *Halogeton glomeratus* (halogeton), are prevalent on BLM and private lands within the range of Colorado hookless cactus (BLM 2020a, p. 35). Invasive weeds alter the ecological characteristics of cactus habitat, making it less suitable for the species (Service 1990, p. 11). In addition, invasive annual weeds are often able to outcompete perennial native species for the essential nutrient nitrogen under drought conditions (Everard et al. 2010, pp. 85, 93–94). However, despite their prevalence throughout the range of Colorado hookless cactus species, individual plants experience extreme detrimental effects of invasive weeds only in localized areas (Service 2022, pp. 18–21; BLM 2020a, p. 35).

Currently, invasive vegetation affects only individual Colorado hookless cactus plants; invasive species are not causing any broad-scale reductions in recruitment or survival in entire AUs. However, the effects of invasive vegetation could increase in the future if infestations expand or if treatments become less effective. Thus, we included an analysis in the SSA to examine species' potential response to future changes in this stressor (Service 2022, pp. 18–21).

Oil and Gas Development

Oil and gas development can also affect Colorado hookless cactus plants and habitat. Increased surface disturbance from wells, roads, and pipelines for oil and gas projects can fragment or destroy habitat; disturb individuals; increase erosion, soil compaction, and sedimentation; destroy pollinator habitat; increase airborne dust and subsequent dust accumulation on cacti, which can increase tissue temperature and reduce photosynthesis, thus decreasing plant growth, vigor, and water use efficiency; indirectly increase recreational access to habitat through increased road construction; and increase invasive vegetation because of the associated surface disturbances (Service 2010, pp. 6–7).

For *S. glaucus*, only 5 percent of the AUs (19,365 leased ac (7,837 ha) of 379,348 total ac (153,517 ha) of habitat) are within BLM lands leased for oil and gas (BLM 2021a, unpaginated). This proportion is higher for *S. dawsonii*; 58 percent of the area within AUs are leased for oil and gas development on BLM lands (65,384 ac (26,419 ha) of 112,723 total ac (45,617 ha) of habitat) (BLM 2021a, unpaginated). However, leased areas do not equate to areas of surface disturbance; even if these areas are leased for oil and gas development, only small subsets of these areas are actually being actively explored or extracted (Colorado Oil and Gas Conservation Commission (COGCC) 2022a, unpaginated). Moreover, oil and gas development does not occur throughout all of the species' ranges; for *S. glaucus*, active wells are only in the Devil's Thumb AU (one

active well site), North Fruita Desert AU (10 active well sites), Whitewater AU (26 active well sites), and a very small portion of the Palisade AU (one active well site) (COGCC 2022b, unpaginated). For *S. dawsonii*, while oil and gas development occurs in both AUs (Roan Creek (60 active well sites) and Plateau Creek (51 active well sites)), 42 percent of these AUs are not leased for oil and gas development (COGCC 2022b, unpaginated; BLM 2021a, unpaginated). Additionally, there are no new or pending permits to drill new oil and gas wells within either species' range; however, as we describe in more detail below, development could increase within portions of *S. dawsonii*'s range in the future (COGCC 2022c, unpaginated; COGCC 2022d, unpaginated).

Additionally, BLM's resource planning documents include conservation measures to minimize adverse impacts of natural resource extraction to listed and sensitive species, including the Colorado hookless cactus; this includes limiting oil and gas development within a 200-m (656-ft) buffer around any currently occupied or historically occupied Colorado hookless cactus habitat, when possible and with some exceptions (BLM 2020a, p. 34; BLM 2015a, p. B-13; BLM 2015b, p. B-22; BLM 2020b, p. B-9). These limitations and buffers apply to *S. glaucus* and *S. dawsonii* while they are federally listed species or BLM sensitive species; if these species are no longer Federally listed or on BLM's sensitive species list, these buffers would no longer apply. However, even then, as we describe above, based on our analysis of Colorado Oil and Gas Conservation Commission (COGCC) data, oil and gas extraction is relatively limited throughout the range of both species compared to the amount of occupied habitat (COGCC 2022a, unpaginated; COGCC 2022b, unpaginated; COGCC 2022c, unpaginated; COGCC 2022d, unpaginated). Moreover, due to their biology and life history characteristics, both species are relatively resilient to nearby disturbance (as we discuss further in our analysis of *Current Condition* below).

Furthermore, approximately 30 percent of the land in *S. glaucus* AUs and 41 percent of the land in *S. dawsonii* AUs have special BLM land management designations in the form of NCAs, ACECs, and a Wilderness Area, which further protect the species from the impacts of oil and gas development (Service 2022, p. 10). The protections provided by these management designations are not contingent upon the species' federally listed status, and these designations help to facilitate the maintenance and recovery of cactus occurrences because they are areas where Colorado hookless cactus is not likely to be disturbed nor will its habitat be adversely altered by land-use actions (BLM 2020a, p. 26). All 30 percent of the areas within *S. glaucus* AUs that have special land management designations include stipulations that either withdraw lands from oil, gas, and mineral development; implement "no-surface-occupancy" stipulations; or prohibit surface disturbing activities (Service 2022, pp. 19–22). Therefore, no new oil and gas activity is permitted in almost 30 percent of *S. glaucus*'s range (with the exception of portions of the Devil's Thumb AU); these areas where no new oil and gas activity is permitted coincide with over half (over 56 percent) of the estimated *S. glaucus* occurrences (Service 2022, pp. 14, 30). Similarly, all 41 percent of the areas within *S. dawsonii* AUs that have special land management designations include no-surface-occupancy stipulations that limit oil and gas development in these portions of the species' range.

Thus, currently, oil and gas development is affecting only a small proportion of individual Colorado hookless cactus plants, due to limited leasing and development and BLM's protective measures; however, the effects of oil and gas development could increase in the future. Nevertheless, given the variable oil and gas potential of the area, and the protections outlined above, the only AUs where oil and gas development could plausibly increase in the future are the Roan Creek and Plateau Creek AUs (*S. dawsonii*)

(Service 2022, p. 30). Thus, we included an analysis in the SSA to examine the species' potential response to future changes in this stressor (Service 2022, pp. 18–21).

Off-Highway Vehicle Recreational Use

Off-highway vehicle (OHV) use can cause soil compaction and erosion, which can physically damage habitat, the surrounding plant community, and the hydrology of the area. OHVs can also carry invasive and introduced plants to new sites and present a risk of spilled contaminants, such as oil spills, gasoline, and grease. OHV use can also injure or kill above-ground plants or cause direct harm to plants through accumulation of dust. OHV use can create especially negative impacts when users travel off designated routes (Service 2022, pp. 18–21).

The relatively barren nature and other topographical features of Colorado hookless cactus habitat make it desirable to OHV users (BLM 2020a, p. 38). Even though OHV recreation is popular and widespread within Colorado hookless cactus habitat, there is little evidence of direct negative impacts to plants (Service 2010, p. 8; BLM 2020a, p. 38).

BLM's resource planning documents include conservation measures to minimize adverse impacts of land use to listed and sensitive species, including the Colorado hookless cactus (BLM 2015a, pp. 49, 102–105; BLM 2015b, pp. 26, 101–103, 123, 145, 147, 150; BLM 2015c, p. M-25; BLM 2020b, pp. II-87, I-4–I-10). In their Travel Management Plans for the Grand Junction and Uncompahgre Field Offices, BLM identified multiple routes for closure to protect sensitive areas (BLM 2015c, p. M-24; BLM 2020b, p. I-7). These two travel management plans cover the entirety of *S. glaucus*'s range and the majority of *S. dawsonii*'s range. While the resource management plan for the Colorado River Valley Field Office, which covers the remainder of *S. dawsonii*'s range, does not contain a travel management plan specifically, it includes strategies for "Comprehensive Trails and Travel Management," including limiting

recreational use to designated routes (BLM 2015b, pp. 102–104). Additionally, approximately 30 percent of the land in *S. glaucus* AUs and 41 percent of the land in *S. dawsonii* AUs have special BLM land management designations in the form of NCAs, ACECs, and a Wilderness Area, which further protect the species from the impacts of OHV use by limiting routes within 200 m (656 ft) of sensitive plants or prohibiting all motorized travel (BLM 2020a, pp. 27–29; Service 2022, pp. 19–21). For example, when the Dominguez-Escalante NCA was created in 2009, which covers 210,172 ac (85,053 ha) within the Dominguez-Escalante, Gunnison River East, and Cactus Park AUs, many "miles of routes were closed to mechanized and motorized travel," which includes the use of OHVs (BLM 2020a, p. 27).

As human populations continue to grow in the areas surrounding Colorado hookless cactus, demand for OHV recreation is likely to continue to increase. However, BLM would be able to add routes only in areas outside of the aforementioned ACECs and Wilderness Area. Any increases in designated OHV routes would occur as a result of land use planning processes that would comply with the stipulations of the Federal Land Policy and Management Act of 1976 and the National Environmental Policy Act (BLM 2020a, p. 38). Given the protections detailed above, and the accessibility of certain areas to OHV users, the only AUs where OHV use could plausibly increase in the future are the North Fruita Desert, Devil's Thumb, Gunnison Gorge, and Whitewater AUs (*S. glaucus*) (Service 2022, p. 30). The area represented in these four AUs constitutes approximately half of *S. glaucus*' AU range, but it is unlikely OHV use would occur across the entire area of these AUs. Through similar processes, BLM may also choose to close areas to recreation or access if necessary to protect sensitive resources (BLM 2020a, p. 38). It is plausible that implementation of travel management plans could lead to route closures in *S. glaucus* AUs (Devil's Thumb, Gunnison Gorge, Whitewater,

Palisade, Dominguez-Escalante, North Fruita Desert) and *S. dawsonii* AUs (Plateau Creek, and Roan Creek AUs).

Thus, currently, OHV use is affecting only a small proportion of individual Colorado hookless cactus plants; however, the effects of OHV use could increase in the future if recreational opportunities expand. Therefore, we included an analysis in the SSA to examine species' potential response to future changes in this stressor (Service 2022, pp. 18–21).

Development and Maintenance of Utility Corridors

The installation and maintenance of utility corridors can result in damage, loss, or relocation of plants; fragmentation of habitat; and increases in invasive species (BLM 2020a, p. 34; Service 2022, p. 17). Multiple transmission lines occur within Colorado hookless cactus habitat and "approximately 1,200 plants have been transplanted in association with these projects" (Bio-Logic 2008 as cited in BLM 2020a, p. 34). While every AU has a utility corridor within it, most corridors intersect only a small portion of the AU. Additionally, some of these utility lines are along already-disturbed corridors (e.g., major highways).

In addition to the limited scope of utility corridor development and maintenance within Colorado hookless habitat, federally protected areas further limit the impacts that utility corridor development can have on the species. All but one of the seven ACECs within *S. glaucus*' range and all four of the ACECs within *S. dawsonii*'s range include right-of-way exclusion or avoidance areas (Service 2022, pp. 19–21).

Based on practical locations for utility corridors, and on these protections, it is only plausible that development could increase in the energy corridor that intersects the Whitewater, Devil's Thumb, and Cactus Park AUs and along the I–70 corridor in the Palisade AU (Service 2022, p. 30). It is also possible that developers could replace an existing powerline with a larger structure in the Devil's Thumb and Whitewater AUs to

increase capacity, which could cause significant ground disturbance (Service 2022, p. 30). Finally, developers could build additional pipelines in the Roan Creek and Plateau Creek AUs (Service 2022, p. 30).

Thus, currently, development and maintenance of utility corridors are affecting only individual Colorado hookless cactus plants, partly due to BLM's avoidance and mitigation measures; however, the effects of this stressor could increase in the future if development expands. Therefore, we included an analysis in the SSA to examine species' potential response to future changes in this stressor.

Climate Change

Climate change may affect long-term survival of native species, including *Sclerocactus*, especially if longer or more frequent droughts occur. Within the range of Colorado hookless cactus, under lower emission scenarios, summer maximum temperature is expected to increase 4 °F (2.2 °C) and under higher emission scenarios summer maximum temperature is expected to increase 10 °F (5.6 °C) by mid-century, compared to the historical average between 1971 and 2000 (North Central Climate Adaptation Science Center and CIRES 2021, unpaginated). Extreme droughts, like those that occurred in 2002 and 2018, could also become more frequent by mid-century. Historically, droughts of this scale did not occur within the range of the species (North Central Climate Adaptation Science Center and CIRES 2021, unpaginated). By mid-century, under lower emissions scenarios, these extreme droughts could occur two to three times per decade or, under higher emissions scenarios, eight to nine times per decade (North Central Climate Adaptation Science Center and CIRES 2021, unpaginated).

In addition, invasive annual weeds are often able to outcompete perennial native species for the essential nutrient nitrogen under drought conditions (Everard et al. 2010, pp. 85, 93–94). Drought conditions could further hinder BLM's efforts to control

invasive weeds and restore native vegetation, which is already difficult due to the extreme environment of the Colorado and Gunnison River basins (Service 1990, p. 11; BLM 2008a, p. 44).

Climate change vulnerability analyses concluded that Colorado hookless cactus likely has low vulnerability to climate change (BLM 2020a, pp. 43–44); however, these analyses predated the taxonomic split of Colorado hookless cactus and thus analyzed the range that contains both *S. glaucus* and *S. dawsonii*. First, NatureServe's Climate Change Vulnerability Index (CCVI), which evaluates species' vulnerability to climate change based on multiple factors, indicated that Colorado hookless cactus was "not vulnerable" or "presumed stable" rangewide, meaning the number of plants or range extent is not likely to increase or decrease considerably by mid-century (Treher et al. 2012, pp. 52, 8). Second, a combination of CCVI and species distribution modeling (SDM) methods in indicated that Colorado hookless cactus "will not be vulnerable to climate change" within the next 30 years (Still et al. 2015, p. 116). This analysis predicted that the species' range could shift or increase under projected changes in climate given the species has no dispersal constraints and vast areas of suitable habitat beyond known occurrences (Still et al. 2015, p. 116). Finally, an additional SDM effort, which aimed to predict changes to the species' range under five different future climate scenarios, concluded that climate change does not present a threat, because all but one model indicate that either no range contraction will occur or that range extent will expand by midcentury (Price 2018, appendix 3 of BLM 2020a, p. 60).

Although multiple different models predict the Colorado hookless cactus has low vulnerability to climate change, CNHP's CCVI suggested that Colorado hookless cactus is extremely vulnerable to climate change given "(1) natural and anthropogenic barriers to movement; (2) likelihood of short seed dispersal distances; (3) lack of variation in annual precipitation in occupied habitat over last 50 years; (4) potential increase in

climate influenced disturbances within its habitat, (5) potential for wind and solar energy development within its range, and (6) pollinator specificity" (CNHP 2015, p. 533). Although the weight of research indicates both species likely have low vulnerability to climate change, given the uncertainty this CNHP study introduced, we included an analysis in the SSA to examine species' potential response to future changes in this stressor.

Cumulative Effects

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have analyzed not only the individual effects various stressors could have on the species but also their potential cumulative effects. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future condition of the species. To assess the current and future condition of the species, we undertake an iterative analysis that encompasses and incorporates the threats individually and then accumulates and evaluates the effects of all the factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative effects analysis. For example, to assess current resiliency, we used a condition category table (see *Current Condition* below) to analyze how livestock use, invasive species, oil and gas development, OHV recreational use, development and maintenance of utility corridors, and the effects of global climate change, taken together, may influence habitat condition, survivorship, population size, and water availability. Similarly, we analyzed how changes in these stressors, when considered together, may influence habitat condition, survivorship, population size, and water availability in the future. We also considered

how these same stressors may affect species' current and future redundancy and representation.

Current Condition

In our SSA report, we evaluate current condition by examining current levels of resiliency in the eight *S. glaucus* AUs and two *S. dawsonii* AUs, and implications for redundancy and representation. Here, we summarize our evaluation of current condition for resiliency, redundancy, and representation. Additional detail regarding our analysis is provided in the SSA report (Service 2022, pp. 22–28).

Resiliency

We describe the resiliency for each of the 10 AUs in terms of the habitat and demographic factors needed by the Colorado hookless cactus (Service 2022, pp. 10–16, 22–28). We developed a categorical model to calibrate resiliency based on the range of habitat and demographic conditions in each AU. In a categorical model, we first identify resource or demographic factors that contribute to the species' resiliency; typically, these factors align with the individual resource needs and population-level needs we identified in the SSA analysis. We then define threshold values for each identified resource or demographic factor that represent high, moderate, or low levels of that factor. Finally, we evaluate whether the current levels of each resource or demographic factor in an AU fall within the predetermined thresholds for a high, moderate, or low score for the category; we then average these scores for each category to develop an overall current resiliency score for each AU.

For Colorado hookless cactus, our categorical model assessed the resiliency of each AU by evaluating (1) the condition of habitat in each AU based on an index that evaluates a number of habitat factors including invasive species cover, bare ground, native perennial cover, the relative size of the AU, and the probability of occurrence based on a BLM habitat suitability model (Holsinger and Krening 2021, p. 5); (2) the

summer water deficit, a proxy for drought and soil moisture that approximates the availability of water; (3) survival rates for each species, calculated from long-term monitoring data; and (4) a minimum population size estimate for each AU (Service 2022, pp. 22–24). We selected these habitat and demographic factors based on their importance to the species' resiliency and because we could evaluate them relatively consistently across all 10 AUs. We then used this categorical model as a key to evaluate resiliency for each AU by systematically evaluating the current condition of each habitat and demographic factor. The AUs with higher overall resiliency are at less risk from potential stochastic events, such as climatic variation, than AUs with lower overall resiliency. Our SSA report provides additional detail regarding the methodology we used to evaluate resiliency for each of the 10 AUs (Service 2022, pp. 22–28).

When measured against the metrics outlined in our categorical model (Service 2022, pp. 22–24), all but one of the *S. glaucus* AUs have high resiliency. This finding is due to the large estimated number of individuals in each AU, high levels of survivorship, adequate habitat resources, and a current summer water deficit (averaged over the past decade) that is similar to the historical average. The only AU that does not have high resiliency is the Palisade AU, which has moderate resiliency overall due to its extremely small population size and moderate score for the habitat condition index. This AU is considerably smaller in area than the other AUs. A major highway (U.S. Interstate 70) and the Colorado River also cut through this AU, fragmenting the habitat. Additionally, a high proportion of this AU is private and State land, which contain existing forms of development (e.g., truck stop, shooting range, power plant) that present additional stressors to the species and its habitat (Lincoln 2021, pers. comm.).

Both *S. dawsonii* AUs have high resiliency (see Table below). This score is due to the high estimated number of individuals in each AU, high levels of survivorship, high and moderate availability of habitat features that support the cactus, and a current

summer water deficit that is similar to the historical average. The stressors operating in the Plateau Creek AU and the Roan Creek AU are comparable, but the Plateau Creek AU is geographically smaller, which partly influences its lower rating for the population size category (Lincoln 2021, pers. comm.).

Rangewide monitoring efforts have demonstrated a stable trend over recent years and have also provided a detailed understanding of demographic features and population dynamics. Across their limited ranges, both species of Colorado hookless cactus are relatively abundant, which contributes to the high levels of resiliency in all but one AU. At the time of listing in 1979, and prior to the taxonomic splits between the two Utah *Sclerocactus* species and Colorado's *S. glaucus* and *S. dawsonii*, it was thought that the combined total for the now four species consisted of approximately 15,000 individual plants in both Colorado and Utah (44 FR 58868, October 11, 1979). After the taxonomic split in 2009, estimates from CNHP suggested there were approximately between 19,000 and 22,000 plants for the total rangewide number of individuals in both species (*S. glaucus* and *S. dawsonii*), based on observations within element occurrence records, which do not necessarily represent a total count of plants for the entire range of the species (Service 2022, p. 13). However, as we discuss below, we now know that there are many more plants than previously reported.

In a recent paper from BLM, a novel sampling-based procedure was used to estimate the minimum population size of *S. glaucus*. They estimated the minimum population size for the entire area of occupation of the taxon by using plant density estimates derived from sampled macroplots and extrapolating them to known habitat areas. This method produced population size estimates for the species that are much higher than previous estimates (Krening et al. 2021, entire). Using this sampling-based procedure to determine the minimum number of plants in each AU, *S. glaucus* has at least 68,120 plants (90 percent lower confidence level estimate) and a minimum population

estimate of 103,086 plants; *S. dawsonii* has at least 21,058 plants and a minimum population estimate of 31,867 (Service 2022, p. 14; Holsinger and Krening 2021, p. 10). Based on the 2021 BLM monitoring report for the species, which we received after completion of the SSA report, population sizes have not changed considerably relative to the 2020 estimates evaluated in the SSA (BLM 2021b, p. 7). Over the entire period of BLM monitoring, the species still demonstrates an increasing trend (BLM 2021b, p. 7).

TABLE.— Measure of current resiliency of *S. glaucus* and *S. dawsonii* based on current demographic, distribution, and habitat conditions in the species' AUs (Service 2022, pp. 26–27)

Species	Analysis Unit	Habitat Condition Index	Survivorship	Minimum Population Size	Summer Water Deficit	Overall AU Resiliency Score
S. glaucus	Whitewater	High	High	High	High	High
	Palisade	Moderate		Low	High	Moderate
	Dominguez-Escalante	High		High	High	High
	North Fruita Desert	Moderate		Moderate	High	High
	Devil's Thumb	High		Moderate	High	High
	Cactus Park	High		High	High	High
	Gunnison Gorge	Moderate		Moderate	High	High
	Gunnison River East	High		High	High	High
S. dawsonii	Plateau Creek	Moderate	High	Moderate	High	High
	Roan Creek	High		High	High	High

Redundancy

Redundancy describes the number and distribution of AUs, such that the greater the number and the wider the distribution of the AUs, the better the Colorado hookless cactus can withstand catastrophic events. The plausibility of catastrophic events also influences species' redundancy; if catastrophic events are unlikely within the range of the species, catastrophic risk is inherently lower. We are unaware of any plausible activity or naturally occurring event that would constitute a catastrophic event for this species. For example, fire is not a common occurrence in *S. glaucus* or *S. dawsonii* habitat as this habitat lacks the fuels to sustain a burn, though increased invasive species presence could elevate this risk (Service 2022, p. 28). Additionally, the range of both species contain natural and humanmade barriers (i.e., rivers, canyons, highways) that would prevent the spread of any catastrophic fire throughout the entire range of the species. Redundancy for narrow endemic species is intrinsically limited; however, *S. glaucus* plants are distributed broadly across the range of the species in eight AUs, providing redundancy throughout its relatively small geographic range. With only two AUs, redundancy of *S. dawsonii* is limited; however, as a narrowly endemic plant, it has likely always had a small range and limited redundancy, and there has not been a known decrease in redundancy compared with its historical range. Additionally, given the lack of plausible catastrophic events across the range of both species, even the narrow range of *S. dawsonii* does not introduce appreciable catastrophic risk.

Representation

Both species exhibit some ecological and morphological variability, coupled with low to moderate genetic diversity among AUs (McGlaughlin and Naibauer 2021, p. 22). Inbreeding is not an immediate concern for either species (McGlaughlin and Naibauer 2021, p. 22). Additionally, *S. glaucus* demonstrates sufficient connectivity, which results in ongoing and recent genetic exchange (McGlaughlin and Naibauer 2021, p. 2). *S.*

dawsonii is genetically isolated and diverged from *S. glaucus*; all genetic analyses support that *S. dawsonii* is a distinct entity (McGlaughlin and Naibauer 2021, p. 2). Recent population bottlenecks do not appear to be a concern, based on the relative consistency of levels of genetic diversity found in recent studies (McGlaughlin and Naibauer 2021, p. 22).

Future Scenarios and Future Condition

In our SSA report, we forecasted the resiliency of *S. glaucus* and *S. dawsonii* AUs and the redundancy and representation of each species to mid-century (the mean of projections for 2040 to 2069) using a range of plausible future scenarios. After mid-century, the changes in climate conditions that different climate models and emissions scenarios project begin to diverge widely (Rangwala et al. 2021, p. 4); in other words, the spread of potential projected temperature increases broadens substantially after mid-century. Therefore, we focused our analysis of future condition on mid-century to avoid the large uncertainty in climate change at the end of the twenty-first century (Rangwala et al. 2021, p. 4). We also selected this timeframe because we can make reliable predictions regarding changes in other stressors to the species, such as land management (i.e., this timeframe encompasses at least one revision to BLM resource management plans), and is biologically meaningful to the species to begin to understand the response of ecosystems to those changes.

We used future climate models downscaled to the ranges of the species, in combination with forecasted changes in the location and intensity of stressors, to develop three future scenarios and evaluate the condition of the species under each of those scenarios. By capturing a range of plausible future scenarios, we can assume that actual future conditions will likely fall somewhere between these projected scenarios. Detailed descriptions of each scenario are available in the SSA report (Service 2022, pp. 29–36).

As many of the stressors that affect *S. glaucus* and *S. dawsonii* occur on BLM lands, future scenarios were developed with input from BLM about plausible changes in the location and intensity of stressors on BLM land. Given some level of uncertainty about the conditions that will occur by mid-century, these scenarios represent optimistic, continuation, and pessimistic future conditions to capture the plausible range of future conditions the species may experience. Therefore, our evaluation of future conditions presents a plausible range of expected species responses. While the metrics used to assess the current resiliency of *S. glaucus* and *S. dawsonii* AUs are quantitative, we do not have a reliable way to quantitatively forecast these metrics into the future. Instead, future conditions are expressed qualitatively, using the results of our current condition analysis as the baseline. Species experts used professional judgement to predict how the species and their habitats would respond to each future scenario (Krening 2021, pers. comm.).

In the Optimistic scenario, the overall resiliency of each AU for both species remains the same as current condition. Although the overall resiliency of each AU does not change, the resiliency of the Plateau Creek (*S. dawsonii*) and Devil's Thumb (*S. glaucus*) AUs increase slightly due to higher ratings for habitat conditions and population size, respectively. Under this scenario, decreases in activities such as grazing and OHV use (consistent with current stipulations in BLM grazing permits and travel management plans) that degrade *S. glaucus* and *S. dawsonii* habitat allow for passive restoration, which leads to improved habitat conditions in the Plateau Creek AU and an increase in population size in the Devil's Thumb AU. Summer water deficit is expected to slightly decrease, meaning more water is available for germination, growth, and reproduction. Redundancy and representation for *S. dawsonii* increase under this scenario, as compared to current condition, due to an increase in resiliency in the Plateau Creek AU. Redundancy and representation of *S. glaucus* also increase slightly under this scenario due to an increase in resiliency in the Devil's Thumb AU.

In the Continuation scenario, we expect resiliency, redundancy, and representation to remain relatively unchanged from the current condition. Resiliency of the Palisade AU (*S. dawsonii*) is moderate; resiliency of all other AUs is high. Despite the increase in water deficit as compared to historical conditions under this scenario (meaning that less water would be available to the plants), this slight decrease in water availability would have minimal impact, because it is well within the range of variability that the species have historically experienced.

In the Pessimistic scenario, hot and dry conditions may negatively affect survivorship and recruitment of the species. Water deficit is more than one standard deviation higher than the historical mean, meaning that on average, less water is available to support germination, growth, and reproduction. Under the Pessimistic scenario, although BLM land management direction and special land management designations do not change, continued ground disturbance and habitat degradation caused by grazing, increasing OHV use (due to increased demand from population growth), increasing demand for oil and gas development and utility corridor development, and an increase in invasive plant species negatively affect the amount and quality of habitat available and reduce survival rates and overall population sizes, leading to a decrease in resiliency in the Whitewater, Palisade, North Fruita Desert, Devil's Thumb, Cactus Park, Gunnison Gorge, and Gunnison River East AUs (*S. glaucus*) and in the Plateau Creek AU (*S. dawsonii*). Overall, one *S. glaucus* AU is in high condition, six *S. glaucus* AUs are in moderate condition, and one is in low condition. *S. dawsonii* has one AU in high condition and one AU in moderate condition.

Redundancy and representation of *S. glaucus* decreases slightly in this scenario due to the decrease in resiliency in all but one AU; although no AUs are expected to be extirpated, each AU contains multiple clusters of plants, and some diversity within AUs could be lost. However, even in the most pessimistic plausible scenario, all but one of the

eight AUs are expected to have at least 500 to 10,000 plants, thereby preserving much of the species' redundancy and representation. Despite high and moderate resiliency of the two *S. dawsonii* AUs, representation and redundancy are lower than under the Optimistic and Continuation scenarios and under current condition due to the Plateau Creek AU's moderate resiliency; this AU had high resiliency under all other scenarios. With only two known *S. dawsonii* AUs, the loss of one of these AUs due to catastrophic, natural, or human-caused events would cause a severe loss of redundancy and representation of the species; however, loss of either AU is not expected, even under the Pessimistic scenario. As with *S. glaucus*, some variation within AUs could be reduced under this scenario; however, ecological, morphological, and genetic variation will continue to be represented by the multiple AUs across *S. dawsonii*'s range.

Conservation Efforts and Regulatory Mechanisms

Positive actions, in the form of conservation efforts such as land protections and regulations, have reduced sources of habitat degradation, and multiple agencies, volunteers, and community members are committed to the conservation and preservation of Colorado hookless cactus. BLM owns and manages approximately 72 percent and 68 percent, respectively, of the land that comprises *S. glaucus* and *S. dawsonii* AUs (Service 2022, pp. 18–21). The majority of the remaining habitat is privately owned; less than 1 percent is owned by State or local governments (Service 2022, p. 18).

Within the range of the Colorado hookless cactus, the BLM has included conservation measures in its resource planning documents to minimize adverse impacts of land use to listed and sensitive species, including the Colorado hookless cactus (BLM 2020a, p. 26). For example, BLM resource management plans (RMPs) for the Colorado River Valley, Grand Junction, and Uncompahgre field offices (the three BLM field offices within the range of the species) include motorized recreation restrictions, energy development restrictions, and grazing management; provisions for research to aid in

better understanding the effects of stressors on the species and guide conservation efforts; and provisions for habitat improvements and vegetation management (e.g., reducing encroachment of woody species, fuels management, closing of livestock allotments, or maintaining rangeland health standards) (Service 2022, pp. 18–21, 28–36; BLM 2015a, pp. 41, 68; BLM 2020b, p. II-24).

The current condition of the species provides insight into the effectiveness of these measures and management; all but one of the *S. glaucus* AUs and both *S. dawsonii* AUs have high resiliency, including moderate to high habitat condition (Service 2022, pp. 26–27). This conclusion demonstrates that, both due to the species' natural hardiness and to these conservation efforts and other land protections, the stressors are not currently meaningfully reducing the species' survival and growth.

Even without the protections of the Act, both species would remain BLM sensitive species for at least 5 years (BLM 2008b, pp. 3, 36). If these species are no longer on the Federal List of Endangered and Threatened Plants or BLM's sensitive species list, the measures specific to listed and sensitive species in these RMPs would no longer apply (e.g., buffers around oil and gas development). However, the majority of measures in these RMPs are not unique to Colorado hookless cactus, but rather provide general guidance for effective land management and rangeland health. Continued responsible management of the landscapes in which the Colorado hookless cactus occurs, even if not directed specifically towards the species, will still provide benefit.

Further, approximately 30 percent of the land in *S. glaucus* AUs and 41 percent of the land in *S. dawsonii* AUs have special BLM land management designations in the form of NCAs, ACECs, and a Wilderness Area (Service 2022, pp. 18–21). These designations limit or exclude the authorization of certain land uses, and some designations were specifically created for the conservation of natural resources; all but 3 of 11 ACECs specifically referenced the protection of Colorado hookless cactus as a

foundational goal. The protections provided by these management designations are not contingent upon the species' federally listed status, and these designations help to facilitate the maintenance and recovery of cactus occurrences, because they are areas where Colorado hookless cactus is not likely to be disturbed or adversely altered by land-use actions (BLM 2020a, p. 26). We discuss the specific protections each of these areas provides under the relevant stressors above.

BLM's ACECs do not have an expiration date, and removing an ACEC designation is not simple. A withdrawal of an ACEC can be made only by the Office of the Secretary (43 U.S.C. 1714); additionally, the ACECs that include *S. glaucus* and *S. dawsonii* habitat were designated to protect multiple species and resources in addition to the Colorado hookless cactus (Service 2022, table 6, pp. 19–21). Likewise, NCAs and Wilderness Areas are designated by Congress and are designed to protect multiple resources, not only the Colorado hookless cactus. Therefore, it is unlikely these special management designations will change in the coming decades, even if the Colorado hookless cactus species are delisted.

We describe each of these BLM areas with special management designations, and the specific protections they provide, in table 6 of the SSA (Service 2022, pp. 19–21) and in table 2 of the 5-year status review (Service 2021, pp. 10–11). The current condition of the species provides insight into the effectiveness of these protected areas; all but one of the *S. glaucus* AUs and both *S. dawsonii* AUs have high resiliency, including moderate to high habitat condition (Service 2022, pp. 26–27). This conclusion demonstrates that, both due to the species' natural hardiness and to these land protections and other conservation efforts, the stressors are not currently meaningfully affecting the species' survival and growth.

A recovery plan for Colorado hookless cactus has not been developed; therefore, there are no specific delisting criteria for the species. We developed a recovery outline

for Colorado hookless cactus in 2010 (Service 2010, entire). Additionally, we reviewed the status of the species in the 2008 and 2021 5-year status reviews (Service 2008, entire; Service 2021, entire). In the 2008 review, we identified remaining threats to the species and actions that could be taken to make progress in addressing those threats and ensuring long-term management. One such recommendation was to conduct rangewide inventories and improve population monitoring (Service 2008, p. 4). Denver Botanic Gardens and BLM have closely monitored the species at multiple sites throughout the range of both Colorado hookless cactus species since 2007 (DePrenger-Levin and Hufft 2021, entire; BLM 2021b, entire). Based on over a decade of this rich monitoring data, BLM developed a method of estimating population size and trends in 2021 (Krening et al. 2021, entire).

The 2010 recovery outline also included an initial action plan for the species' recovery that included actions such as (1) expanding comprehensive surveying to improve our understanding of trends; (2) establishing formal land management designations to provide for long-term protection of important populations and habitat; (3) directing development projects to avoid cactus occurrences and incorporate standard conservation measures; (4) encouraging investigations into Sclerocactus species' vulnerability to climate change; and (5) resolving open taxonomic questions for the species. The Service and its partners have since accomplished all five of these actions.

Since 2010, BLM and the Denver Botanic Gardens have expanded their annual monitoring program to improve estimation of the species population sizes; these estimates indicate there are substantially more plants on the landscape than were known at the time of listing, and have changed our understanding of the degree to which the species is resilient to the purported threats at the time of listing. BLM has also established multiple ACECs and an NCA that provide long-term protection to sensitive plants and habitats. In the past 11 years, multiple assessments of the species' vulnerability to climate

change have concluded that Colorado hookless cactus has low vulnerability to future climatic changes (Price 2018, appendix 3 of BLM 2020a, p. 60; Still et al. 2015, p. 116; Treher et al 2012, pp. 52, 8). Finally, recent research determined that Colorado hookless cactus is in fact two separate species: *S. glaucus* and *S. dawsonii*.

As a result, the Service recommended that threats to the species had been sufficiently ameliorated such that listing was no longer warranted in our 2021 5-year status review.

Determination of Colorado Hookless Cactus (*S. glaucus* and *S. dawsonii*) Status

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

When we listed the Colorado hookless cactus as threatened on October 11, 1979, we identified the potential development of oil shale deposits and gold mining (Factor A), off-road vehicle use (Factor A), collecting pressure (Factor B), livestock grazing (Factor C), and an inadequacy of existing regulatory mechanisms (Factor D) as threats to the existence of the species (44 FR 58868, October 11, 1979). In our SSA, we evaluated

these stressors and additional stressors that were identified after the time of listing. Much more is presently known about the species' stressors than at the time of listing.

Several of the stressors identified in the original listing decision are no longer relevant. Given the taxonomic changes, and thus range extent changes, that the species has undergone in the past 40 years, oil shale and tar sands development and hybridization are no longer relevant stressors (Service 2022, p. 18; Service 2021, pp. 19–20). Additionally, collection from the wild has not occurred at the level anticipated at the time of listing; collection is not having population- or species-level effects on either species (BLM 2020a, p. 36). Thus, stressors that could influence both species of the Colorado hookless cactus at the AU- or species-scale include livestock use (Factor A), invasive species (Factor A), oil and gas development (Factor A), OHV recreational use (Factor A), development and maintenance of utility corridors (Factor A), and the effects of global climate change (Factor A). Although livestock grazing was categorized as a stressor under Factor C at the time of listing, we believe that the effects of livestock grazing are better characterized by Factor A. The spines on cactus plants generally make them undesirable to livestock; however, livestock can degrade habitat conditions by trailing through and trampling habitat. Only on rare occasions do cattle directly trample or dislodge cactus plants.

We also evaluated a variety of conservation efforts and mechanisms across the 10 AUs of both species that either reduce or ameliorate stressors, or improve the condition of habitats or demographics. These conservation efforts and mechanisms include: three BLM RMPs that taken together, cover the range of the species, which include motorized recreation restrictions, energy development restrictions, and grazing management; research to aid in better understanding the effects of stressors on the species and guide conservation efforts; and habitat improvements and vegetation management (Service 2022, pp. 18–21, 28–36). With 72 percent of *S. glaucus* and 68 percent of *S. dawsonii* AU

acres occurring on BLM land, BLM's implementation of the regulatory mechanisms in their resource planning documents on all of their lands within the range of the species (Factor D) has helped to address the stressors we identified under Factors A and B. While we cannot attribute the currently high resiliency of both species to one specific conservation measure, this high resiliency demonstrates the amelioration of relevant stressors and the adequacy of the existing regulatory mechanisms, both due to the combination of conservation measures in place and the hardiness of the plant (which has shown an ability to tolerate nearby disturbance).

In addition to the implementation of measures that minimize impacts to the Colorado hookless cactus on all BLM lands, approximately 30 percent of the land in *S. glaucus* AUs and 41 percent of the land in *S. dawsonii* AUs have special BLM land management designations (Factor D), which further limit or exclude the authorization of certain land uses and further help to facilitate the maintenance and recovery of cactus occurrences, because they are areas where Colorado hookless cactus occurrences are not likely to be disturbed or adversely altered by land-use actions (BLM 2020a, p. 26). The protections provided by these management designations are not contingent upon the species' federally listed status.

Status Throughout All of Its Range: Sclerocactus glaucus

Currently, seven of the eight *S. glaucus* AUs have high resiliency, and one AU has moderate resiliency (Service 2022, pp. 26–27). The highly resilient AUs have high estimated numbers of individuals, high levels of survivorship, adequate habitat resources, and a current water deficit that is similar to the historical average. One AU has moderate resiliency due to its extremely small population size and moderate score for the habitat index; this AU covers a considerably smaller area than other AUs. Rangewide monitoring has shown a stable trend for Colorado hookless cactus, with no indication of widespread decline. This monitoring has also informed our understanding that *S. glaucus* is currently

much more abundant than originally estimated at the time of listing in 1979. At the time of listing, and prior to the taxonomic splits between the two Utah *Sclerocactus* species and Colorado's *S. glaucus* and *S. dawsonii*, it was thought that the combined total for the now four species consisted of approximately 15,000 individual plants in both Colorado and Utah; now, the minimum population estimate for *S. glaucus* is 103,086 plants.

We are unaware of any plausible activity or naturally occurring event that would constitute a catastrophic event for this species. Thus, while the species is a narrow endemic with a small range compared to wide-ranging species, *S. glaucus*'s relatively large range for a narrow endemic, with eight AUs, and the lack of plausible catastrophic events reduce catastrophic risk for this species, thereby enhancing redundancy. The individuals within and among the AUs also exhibit genetic, ecological, and morphological diversity, contributing to the species' representation.

Moreover, our understanding of the species' stressors has changed since the time the species was listed. Multiple identified stressors are no longer relevant to the species, given past taxonomic changes and subsequent changes in the geographic range of the species (i.e., oil shale and tar sands development) or because they are not occurring at a scale anticipated at the time of listing (i.e., collection). We also have found that, while OHV use and invasive species had the potential to detrimentally impact the species, they have caused only minor, localized impacts (BLM 2020a, pp. 35, 38). Oil and gas development occurs in only a small portion of three of the eight *S. glaucus* AUs.

Since the species was listed, BLM also designated NCAs, ACECs, and a Wilderness Area (Service 2022, pp. 19–21). These designations limit or exclude the authorization of certain land uses, and most of these designations specifically referenced the protection of Colorado hookless cactus as a foundational goal. The protections provided by these management designations are not contingent upon the species' federally listed status, and these designations have helped to facilitate the maintenance

and recovery of cactus occurrences, because they are areas where Colorado hookless cactus is not likely to be disturbed or its habitat adversely altered by land-use actions (BLM 2020a, p. 26). While we cannot attribute the currently high resiliency of all but one AU to one specific conservation measure, this high resiliency demonstrates the amelioration of relevant stressors, both due to the combination of conservation measures in place and the hardiness of the plant (which has shown an ability to tolerate nearby disturbance).

Given the currently high level of resiliency in seven of the eight *S. glaucus* AUs and moderate resiliency of one AU, the additional plants we now know to occur throughout the species' range, the lack of significant imminent stressors, and the low likelihood of catastrophic events, we find that *S. glaucus* currently has sufficient ability to withstand stochastic and catastrophic events, and to adapt to environmental changes. After evaluating threats to the species and assessing the cumulative effect of the threats under the section 4(a)(1) factors, we conclude that the current risk of extinction is low, such that *S. glaucus* is not currently in danger of extinction throughout all of its range.

Under the Act, a threatened species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (16 U.S.C. 1532(20)). The foreseeable future extends only so far into the future as the Service can reasonably determine that both the future threats and the species' responses to those threats are likely (50 CFR 424.11(d)). The Service describes the foreseeable future on a case-by-case basis, using the best available data and taking into account considerations such as the species' life history characteristics, threat-projection timeframes, and environmental variability (50 CFR 424.11(d)). The key statutory difference between a threatened species and an endangered species is the timing of when a species may be in danger of extinction, either now (endangered species) or in the foreseeable future (threatened species).

For the purposes of our analysis, we defined the foreseeable future for both species (*S. glaucus* and *S. dawsonii*) to mid-century (the mean of 2040 to 2069). After mid-century, the changes in climate conditions that different climate models and emissions scenarios project begin to diverge widely (Rangwala et al. 2021, p. 4); in other words, the spread of potential projected temperature increases broadens substantially after mid-century. Therefore, we focused our analysis of future condition on mid-century to avoid the large degree of uncertainty in how climate change is projected to manifest at the end of the twenty-first century (Rangwala et al. 2021, p. 4). We also selected this timeframe because it allows us to reliably predict changes in other species' stressors and land management, and is biologically meaningful to the species to begin to understand the response of ecosystems to those changes.

By mid-century, we anticipate a range of plausible future conditions for *S. glaucus*. Under the Optimistic scenario, the condition of the species is likely to improve over the current condition, with resiliency projected to increase slightly in one *S. glaucus* AU. BLM's closure of certain OHV routes and effective implementation of changes in grazing permit stipulations leads to decreased grazing and OHV pressures, causing improved habitat conditions and an increase in the number of individuals in the AU (Service 2022, p. 30). In the Continuation scenario, we expect resiliency, redundancy, and representation to remain relatively unchanged from the current condition, because stressors and conservation efforts remain very similar to what the species is currently experiencing. In the Pessimistic scenario, although BLM management planning documents and special land management designations do not change, continued ground disturbance and habitat degradation from grazing, an increase in OHV use, increased demand for utility corridor development, an increase in invasive plant species, and a considerable decrease in water availability due to climate change negatively affect the amount and quality of habitat available, and reduce survival rates and overall population

sizes. This is the only scenario in which the condition of the species is projected to decline for *S. glaucus*; one AU's resiliency remains high, six AUs decrease from high to moderate resiliency, and one AU decreases to low resiliency. Even under this pessimistic scenario, the species maintains moderate levels of survival and high or moderate habitat condition in the majority of AUs, despite increasing stressors. In all three scenarios, all eight AUs will remain extant, thereby continuing to contribute to the redundancy and representation of the species.

Given these future projections of resiliency, redundancy, and representation to mid-century, *S. glaucus* could experience a slight decrease in viability under one of the three future scenarios (the pessimistic scenario); however, even in this most pessimistic scenario, all AUs will remain extant and seven of the eight AUs will have moderate to high resiliency.

Two factors support this consistently moderate to high future resiliency: BLM conservation actions and the species' biological characteristics. First, the high to moderate resiliency of *S. glaucus* AUs is, in part, due to land protections and regulations implemented by BLM (Factor D) that will continue to be implemented into the future, even in the absence of protections afforded by the Act, as described under *Conservation Efforts and Regulatory Mechanisms* above. These protections will continue to limit the potential effects of stressors on *S. glaucus* in the future.

Second, independent of future BLM management, the species' biological characteristics moderate its response to increasing stressors. *S. glaucus* is a habitat generalist, which means the species is not constrained to a specific habitat niche; the species' flexible resource requirements increase its resiliency to potential future increases in stressors and its ability to adapt to future change (representation). This determination is evidenced by the species' past ability to maintain high survivorship and resiliency, even in the face of ongoing stressors that the Service originally determined could lead to

decline (e.g., OHV use, invasive species). Additionally, multiple modeling efforts have concluded that Colorado hookless cactus likely has low vulnerability to climate change, given its dispersal capabilities and opportunities for expansion into vast areas of suitable habitat (BLM 2020a, pp. 43–44). Although conditions could become considerably drier under the Pessimistic climate scenario, *S. glaucus* is hardy and already adapted to arid environments. Individuals of this species live many decades and have maintained healthy recruitment and survival, even through droughts and other climatic variation in the past (BLM 2018, pp. 14–15; Hegewisch and Abatzoglou 2020, entire). These characteristics allow the species to maintain moderate survivorship and resiliency, even under the Pessimistic scenario.

Considering the levels of resiliency, redundancy, and representation predicted under each of the future scenarios described in the SSA, *S. glaucus* will be able to withstand stochastic events, catastrophic events, and environmental change into the foreseeable future. Therefore, after assessing the best available information, we conclude that *S. glaucus* is not likely to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout All of Its Range: Sclerocactus dawsonii

Currently, both *S. dawsonii* AUs have high resiliency (Service 2022, pp. 25–26). The highly resilient AUs have moderate to high estimated numbers of individuals (i.e., a minimum population estimate of 31,867 plants total), high levels of survivorship, high and moderate condition of habitat features, and a current water deficit that is similar to the historical average. These high current levels of resiliency reduce the current extinction risk for *S. dawsonii* because they lower the risk to the species from stochastic variation. Rangewide monitoring has shown a stable trend for Colorado hookless cactus, with no indication of widespread decline. This monitoring has also informed our understanding that *S. dawsonii* is currently much more abundant than originally estimated

at the time of listing in 1979. At the time of listing, and prior to the taxonomic splits between the two Utah *Sclerocactus* species and Colorado's *S. glaucus* and *S. dawsonii*, it was thought that the combined total for the now four species consisted of approximately 15,000 individual plants in both Colorado and Utah; now, the minimum population estimate for *S. dawsonii* plants is 31,867 plants.

Additionally, the two AUs and the individuals within the AUs exhibit ecological and morphological diversity, contributing to the representation of the species. In terms of redundancy, we are unaware of any plausible activity or naturally occurring event that would constitute a catastrophic event for this species. Given the lack of plausible catastrophic events across the range of *S. dawsonii*, even its narrow range (two AUs) does not introduce appreciable catastrophic risk.

Moreover, our understanding of species' stressors has changed since the time the species was listed. Multiple identified stressors are no longer relevant to the species, given past taxonomic changes and subsequent changes in the geographic range of the species (e.g., oil shale and tar sands development) or because they are not occurring at a scale anticipated at the time of listing (i.e., collection). We also have found that, while OHV use and invasive species had the potential to detrimentally impact the species, they have only caused minor, localized impacts (BLM 2020a, pp. 35, 38).

Since the species was listed, BLM also designated NCAs, ACECs, and a Wilderness Area (Service 2022, pp. 19–21). These designations limit or exclude the authorization of certain land uses, and most of these designations specifically referenced the protection of Colorado hookless cactus as a foundational goal. The protections provided by these management designations are not contingent upon the species' federally listed status, and these designations have helped to facilitate the maintenance and recovery of cactus occurrences, because they are areas where Colorado hookless cactus is not likely to be disturbed or adversely altered by land-use actions (BLM 2020a,

p. 26). While we cannot attribute the currently high resiliency of both AUs to one specific conservation measure, this high resiliency demonstrates the amelioration of relevant stressors, both due to the combination of conservation measures in place and the hardiness of the plant (which has shown an ability to tolerate nearby disturbance).

Given the currently high level of resiliency in both of the *S. dawsonii* AUs, the additional plants we now know to occur throughout the species' range, the lack of significant imminent stressors, and the low likelihood of imminent catastrophic events, we find that *S. dawsonii* currently has sufficient ability to withstand stochastic and catastrophic events and to adapt to environmental changes. Therefore, we conclude that the current risk of extinction is low, such that *S. dawsonii* is not currently in danger of extinction throughout all of its range.

By mid-century (the foreseeable future), we anticipate a range of plausible future conditions for *S. dawsonii*. Under the Optimistic scenario, the condition of the species improves, with resiliency expected to increase slightly in one *S. dawsonii* AU due to decreased grazing and OHV pressures, causing improved habitat conditions. In the Continuation scenario, we expect resiliency, redundancy, and representation to remain relatively unchanged from the current condition, as stressors and conservation efforts remain very similar to what the species is currently experiencing. In the Pessimistic scenario, although BLM management planning documents and special land management designations do not change, continued ground disturbance and habitat degradation from grazing, increasing demand for oil and gas development and utility corridor development, and an increase in invasive plant species negatively affect the species, which causes a decrease in resiliency in one of the two *S. dawsonii* AUs. Additionally, only under this Pessimistic scenario does water availability drop considerably below the historical average (i.e., more than one standard deviation). This is the only scenario in which we foresee resiliency decreasing for either of the species' two AUs; one AU's resiliency

remains high, and one AU decreases to moderate resiliency. Even in the Pessimistic scenario, survivorship in both AUs remains high. In all three scenarios, both AUs will remain extant, thereby continuing to contribute to the redundancy and representation of the species.

Given these future projections of resiliency, redundancy, and representation to mid-century, *S. dawsonii* could experience a slight increase in extinction risk under one of the three future scenarios (the pessimistic scenario); however, even in this most pessimistic scenario, both AUs will remain extant with moderate to high resiliency.

Two factors support this moderate to high future resiliency: BLM conservation actions and the species' biological characteristics. First, this high to moderate resiliency of *S. dawsonii* AUs is, in part, due to land protections and regulations implemented by BLM (Factor D) that will continue to be implemented into the future even in the absence of protections afforded by the Act, as described under *Conservation Efforts and Regulatory Mechanisms* above. These protections will continue to limit the potential effects of stressors on *S. dawsonii* in the future.

Second, independent of future BLM management, the species' biological characteristics moderate its response to increasing stressors. Like *S. glaucus*, *S. dawsonii* is a habitat generalist, which means the species is not constrained to a specific habitat niche; the species' flexible resource requirements increase its resiliency to potential future increases in stressors and its ability to adapt to future change (representation). This finding is evidenced by the species' past ability to maintain high survivorship and resiliency, even in the face of ongoing stressors that the Service originally determined could lead to decline (e.g., OHV use, invasive species). Additionally, multiple modeling efforts have indicated that Colorado hookless cactus likely has low vulnerability to climate change, given its dispersal capabilities and opportunities for expansion into vast areas of suitable habitat (BLM 2020a, pp. 43–44). Although conditions could become

considerably drier under the Pessimistic climate scenario, the *S. dawsonii* is hardy and already adapted to arid environments. Individuals of this species live many decades and have maintained healthy recruitment and survival, even through droughts and other climatic variation in the past (BLM 2018, pp. 14–15; Hegewisch and Abatzoglou 2020, entire). These characteristics allow the species to maintain high survivorship and moderate to high resiliency, even under the Pessimistic scenario.

Considering the levels of resiliency, redundancy, and representation in each of the future scenarios described in the SSA, under each plausible future scenario, *S. dawsonii* will be able to withstand stochastic events, catastrophic events, and environmental change. Therefore, after assessing the best available information, we conclude that *S. dawsonii* is not likely to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Their 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 *S. glaucus* and *S. dawsonii* are not in danger of extinction or likely to become so in the foreseeable future throughout all of their range, we now consider whether either may be in danger of extinction (i.e., endangered) or likely to become so in the foreseeable future (i.e., threatened) in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant; and, (2) the species is in danger of extinction 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 *S. glaucus* and *S. dawsonii*, we choose to address the status question first. We began by identifying portions of the range where the biological status of the species may be different from their biological status elsewhere in their range. For this purpose, we considered information pertaining to the geographic distribution of (a) individuals of the species, (b) the threats that the species face, and (c) the resiliency condition of populations.

For *S. glaucus*, we evaluated the range of the species to determine if the species is in danger of extinction now or likely to become so in the foreseeable future in any portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. We focused our analysis on portions of the species' range that may meet the definition of an endangered species or a threatened species. For *S. glaucus*, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species' range than in other portions such that the species is in danger of extinction now or likely to become so in the foreseeable future in that portion. We examined the following threats: livestock use, invasive species, oil and gas development, OHV use, development and maintenance of utility corridors, and climate change, including cumulative effects.

Livestock use, invasive species, OHV use, development and maintenance of utility corridors, and climate change occur uniformly across the species' range; there are no portions of the species' range where these stressors occur more intensely. Oil and gas development is occurring in only three AUs (North Fruita Desert, Whitewater, and Palisade AUs), so this threat may be elevated in this area. However, despite this development activity, the North Fruita Desert and Whitewater AUs currently have high resiliency and are expected to maintain this high resiliency under two of three future scenarios. Under the Pessimistic scenario, North Fruita Desert and Whitewater AUs have

moderate resiliency. Oil and gas development is occurring in only a small portion of the Palisade AU (there is only one active well site across more than 9,269 ac (3,751 ha)) and, while this AU has moderate resiliency currently and could drop to low resiliency under the Pessimistic scenario, this is due to the AU's small size and thus inherently low number of plants, not due to oil and gas development. Thus, even though oil and gas development may be concentrated in these AUs, it is not producing a species' response that would indicate the plants therein are in danger of extinction now or in the foreseeable future.

Moreover, although the Palisade AU has a low population size and is the only AU to rank low in resiliency in any future scenario, the AU occupies the smallest area of any *S. glaucus* AU and contributes the least to the species' redundancy and representation. Therefore, this AU is not considered to be a biologically meaningful portion of the species' range where threats are impacting individuals differently from how they are affecting the species elsewhere in its range such that the status of the species in that portion differs from its status in any other portion of the species range.

Overall, we found no biologically meaningful portions of the species' range where threats are impacting individuals differently from how they are affecting the species elsewhere in its range such that the status of the species in that portion differs from its status in any other portion of the species' range. Therefore, we find that the species is not in danger of extinction now or likely to become so in the foreseeable future in any significant portion of its range. This does not conflict with the courts' holdings in *Desert Survivors* v. *Department of the Interior*, 336 F. Supp. 3d 1131 (N.D. Cal. 2018), and *Center for Biological Diversity* v. *Jewell*, 248 F. Supp. 3d. 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not apply the aspects of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578; July

1, 2014), including the definition of "significant" that those court decisions held to be invalid.

For *S. dawsonii*, we evaluated the range of the species to determine if the species is in danger of extinction now or likely to become so in the foreseeable future in any portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. We focused our analysis on portions of the species' range that may meet the definition of an endangered species or a threatened species. For *S. dawsonii*, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species' range than in other portions such that the species is in danger of extinction now or likely to become so in the foreseeable future in that portion. We examined the following threats: livestock use, invasive species, oil and gas development, OHV use, development and maintenance of utility corridors, and climate change, including cumulative effects.

Overall, the threats to this species are uniformly distributed throughout its range and we did not identify a significant concentration of threats that would increase extinction risk in any portion. Oil and gas development occurs in both AUs, as does livestock use, OHV use, invasive species infestation, and development and maintenance of utility corridors. The small range of the species will not experience substantially different temperature or precipitation changes as a result of climate change.

We found no biologically meaningful portions of the species' range where threats are impacting individuals differently from how they are affecting the species elsewhere in its range such that the status of the species in that portion differs from its status in any other portion of the species' range. Therefore, we find that the species is not in danger of extinction now or likely to become so in the foreseeable future in any significant portion of its range. This does not conflict with the courts' holdings in *Desert Survivors* v. *Department of the Interior*, 336 F. Supp. 3d 1131 (N.D. Cal. 2018), and *Center for*

Biological Diversity v. *Jewell*, 248 F. Supp. 3d. 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not apply the aspects of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578; July 1, 2014), including the definition of "significant" that those court decisions held to be invalid.

Determination of Status

Our review of the best available scientific and commercial information indicates that *S. glaucus* and *S. dawsonii* do not meet the definition of endangered species or threatened species in accordance with section 3(6) and 3(20) of the Act. In accordance with our regulations at 50 CFR 424.11(d)(2) currently in effect, *S. glaucus* and *S. dawsonii* have recovered and no longer warrant listing. Therefore, we propose to remove Colorado hookless cactus (*S. glaucus* and *S. dawonii*) from the Federal List of Endangered and Threatened Plants.

Effects of This Rule

This proposed rule, if made final, would revise 50 CFR 17.12(h) by removing Colorado hookless cactus from the Federal List of Endangered and Threatened Plants.

The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, would no longer apply to this species. Federal agencies would no longer be required to consult with the Service under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect Colorado hookless cactus.

There is no critical habitat designated for this species, so there would be no affect to 50 CFR 17.96.

Post-Delisting Monitoring

Section 4(g)(1) of the Act requires us, in cooperation with the States, to implement a monitoring program for not less than 5 years for all species that have been

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.

We are proposing to delist Colorado hookless cactus based on new information we have received as well as conservation actions taken. Given that delisting would be, in part, due to conservation taken by land managers and other stakeholders, we have prepared a draft PDM plan for Colorado hookless cactus. The draft PDM plan discusses the current status of the taxon and describes the methods proposed for monitoring if we delist the taxon. The draft PDM plan: (1) Summarizes the status of Colorado hookless cactus at the time of proposed delisting; (2) describes frequency and duration of monitoring; (3) discusses monitoring methods and potential sampling regimes; (4) defines what potential triggers will be evaluated to address the need for additional monitoring; (5) outlines reporting requirements and procedures; (6) proposes a schedule for implementing the PDM plan; and (7) defines responsibilities. The Service prepared this draft PDM plan in coordination with BLM and the Denver Botanic Gardens. The Service designed the PDM plan to detect substantial declines in Colorado hookless cactus occurrences and any changes in stressors with reasonable certainty and precision. It meets the requirement set forth by the Act because it monitors the status of Colorado hookless cactus using a structured sampling regime over a 10-year period. It is our intent to work with our partners toward maintaining the recovered status of both Colorado hookless cactus species.

We seek public comments on the draft PDM plan, including its objectives and procedures (see **Information Requested**, above), with the publication of this proposed rule.

Required Determinations

Clarity of the Rule

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

(1) Be logically organized;

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

(3) Use clear language rather than jargon;

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

(5) Use lists and tables wherever possible.

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

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), 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. While we notified the Ute Mountain, Jicarilla Apache Nation, Southern Ute, Ute Mountain Ute, and Navajo Nation Tribes of our recommendation to delist the Colorado hookless cactus in our 5-year status review in 2021, we are not aware of any Tribal interests or concerns associated with this proposed rule. We will reach out to affected Tribes upon publication of this proposed rule and invite them to comment on the proposed rule and/or initiate government-to-government consultation.

References Cited

A complete list of references cited in this rulemaking is available on the internet at *https://www.regulations.gov* and upon request from the Colorado Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Fish and Wildlife Service's Species Assessment Team and the Colorado Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

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

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

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

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

§ 17.12 [Amended]

2. Amend § 17.12 in paragraph (h) in the List of Endangered and Threatened Plants by removing the entry under FLOWERING PLANTS for "*Sclerocactus glaucus* (Colorado hookless cactus)".

Martha Williams,

Director,

U.S. Fish and Wildlife Service.

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