

RECOVERY PLAN AMENDMENTS FOR 20 SOUTHWEST SPECIES

The U.S. Fish and Wildlife Service has identified best available information that indicates the need to amend recovery criteria for the below species. Each amendment is recognized as an addendum that supplements the existing recovery plan.

<p>Brady Pincushion Cactus (<i>Pediocactus bradyi</i>) Recovery Plan Original Recovery Plan Approved: March 28, 1985 Page(s) Superseded: 19-34</p>
<p>Endangered Karst Invertebrates (Travis and Williamson Counties, Texas) Recovery Plan Original Recovery Plan Approved: August 25, 1994 Page(s) Superseded: 86-88 Species Included: Bee Creek Cave harvestman (<i>Texella reddelli</i>) Bone Cave harvestman (<i>Texella reyesi</i>) Coffin Cave mold beetle (<i>Batrisodes texanus</i>) Kretschmarr Cave mold beetle (<i>Texamaurops reddelli</i>) Tooth Cave spider (<i>Tayshaneta=Neoleptoneta myopica</i>) Tooth Cave ground beetle (<i>Rhadine persephone</i>) Tooth Cave pseudoscorpion (<i>Tartarocreagris texana</i>)</p>
<p>Holy Ghost Ipomopsis (<i>Ipomopsis sancti-spiritus</i>) Recovery Plan Original Recovery Plan Approved: September 26, 2002 Page(s) Superseded: 18-21</p>
<p>Knowlton Cactus (<i>Pediocactus knowltonii</i>) Recovery Plan Original Recovery Plan Approved: March 29, 1985 Page(s) Superseded: 16</p>
<p>Kuenzler Hedgehog Cactus (<i>Echinocerus fendleri</i> var. <i>kuenzleri</i>) Recovery Plan Original Recovery Plan Approved: March 28, 1985 Page(s) Superseded: 13</p>
<p>Sacramento Prickly Poppy (<i>Argemone pleicantha</i> ssp. <i>pinnatisecta</i>) Recovery Plan Original Recovery Plan Approved: August 31, 1994 Page(s) Superseded: 16-17</p>
<p>Siler Pincushion Cactus (<i>Pediocactus sileri</i>) Recovery Plan Original Recovery Plan Approved: April 14, 1986 Page(s) Superseded: 19-41</p>
<p>Sneed and Lee Pincushion Cacti Recovery Plan Original Recovery Plan Approved: March 21, 1986 Page(s) Superseded: 19 Species Included: Sneed pincushion cactus (<i>Coryphantha sneedii</i> var. <i>sneedii</i>) Lee pincushion cactus (<i>Coryphantha sneedii</i> var. <i>leei</i>)</p>
<p>Socorro Isopod (<i>Thermosphaeroma thermophilum</i>) Recovery Plan Original Recovery Plan Approved: February 16, 1982 Page(s) Superseded: 6-7, 10-11, 13</p>

Star Cactus (*Astrophytum asterias*) Recovery Plan

Original Recovery Plan Approved: August 26, 2003

Page(s) Superseded: 11-14

Tobusch Fishhook Cactus (*Ancistrocactus tobuschii*) Recovery Plan

Original Recovery Plan Approved: March 18, 1987

Page(s) Superseded: iii, 14-15

Zapata Bladderpod (*Lesquerella thamnophila*) Recovery Plan

Original Recovery Plan Approved: July 14, 2004

Page(s) Superseded: 9-11

Zuni Fleabane (*Erigeron rhizomatus*) Recovery Plan

Original Recovery Plan Approved: September 30, 1988

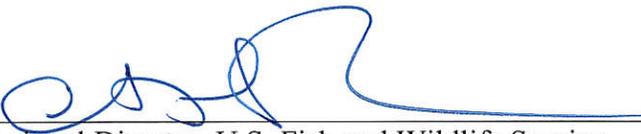
Page(s) Superseded: 14

For

**U.S. Fish and Wildlife Service
Southwest Region
Albuquerque, New Mexico**

August 2019

Approved:


Regional Director, U.S. Fish and Wildlife Service

Date:

8/28/19

Recovery Plan for *Argemone pleicantha* ssp. *pinnatisecta* (Sacramento prickly poppy)

Original Approved: 1994

Original Prepared by: Karen Lightfoot and Robert Sivinski (New Mexico Energy, Minerals, and Natural Resources Department, Forestry and Resources Conservation Division) and Philip Clayton and Anne Cully (New Mexico Ecological Services Field Office)

DRAFT AMENDMENT 1

We have identified best available information that indicates the need to amend recovery criteria for this species since the recovery plan was completed. In this proposed modification, we synthesize the adequacy of the existing recovery criteria, show amended recovery criteria, and the rationale supporting the proposed recovery plan modification. The proposed modification is shown as an appendix that supplements the Sacramento Prickly Poppy (*Argemone pleicantha* ssp. *pinnatisecta*) Recovery Plan (Recovery Plan), superseding only Part II, Objective and Criteria (pages 16-17), of the recovery plan.

**For
U.S. Fish and Wildlife Service
Southwest Regional Office
Albuquerque, NM 87103**

August 2019

BACKGROUND INFORMATION

Recovery plans should be consulted frequently, used to initiate recovery activities, and updated as needed. A review of the recovery plan and its implementation may show that the plan is out of date or its usefulness is limited, and therefore warrants modification. Keeping recovery plans current ensures that the species benefits through timely, partner-coordinated implementation based on the best available information. The need for, and extent of, plan modifications will vary considerably among plans. Maintaining a useful and current recovery plan depends on the scope and complexity of the initial plan, the structure of the document, and the involvement of stakeholders.

An amendment involves a substantial rewrite of a portion of a recovery plan that changes any of the statutory elements. The need for an amendment may be triggered when, among other possibilities: (1) the current recovery plan is out of compliance with regard to statutory requirements; (2) new information has been identified, such as population-level threats to the species or previously unknown life history traits, that necessitates new or refined recovery actions and/or criteria; or (3) the current recovery plan is not achieving its objectives. The amendment replaces only that specific portion of the recovery plan, supplementing the existing recovery plan, but not completely replacing it. An amendment may be most appropriate if significant plan improvements are needed, but resources are too scarce to accomplish a full recovery plan revision in a short time.

Although it would be inappropriate for an amendment to include changes in the recovery program that contradict the approved recovery plan, it could incorporate study findings that enhance the scientific basis of the plan, or that reduce uncertainties as to the life history, threats, or species' response to management. An amendment could serve a critical function while awaiting a revised recovery plan by: (1) refining and/or prioritizing recovery actions that need to be emphasized, (2) refining recovery criteria, or (3) adding a species to a multispecies or ecosystem plan. An amendment can, therefore, efficiently balance resources spent on modifying a plan against those spent on managing implementation of ongoing recovery actions.

METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The recovery criteria were developed based on input by a group of individuals consisting of species experts, biologists, and botanists from New Mexico Energy, Minerals, and Natural Resources Department, U.S. Forest Service (USFS), and the U.S. Fish and Wildlife Service (Service). The development process was informed by the best available science regarding species biology and current threats. The recovery criteria were designed to be objective and quantifiable, in order to meet the conditions needed to ensure species viability through sustainment of populations in the wild that demonstrate resiliency, redundancy, and representation.

ADEQUACY OF RECOVERY CRITERIA

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, "objective, measurable criteria which, when met, would result in a determination...that the species be removed from the list." Legal challenges to recovery plans (see *Fund for Animals v. Babbitt*, 903 F. Supp. 96 (D.D.C. 1995)) and a Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five delisting factors.

Recovery Criteria

The following summarizes the current recovery criteria for the Sacramento Prickly Poppy. For a detailed version of the criteria, please reference the 1994 Sacramento Prickly Poppy (*Argemone pleiakantha* spp. *pinnatisecta*) Recovery Plan (USFWS 1994, pp. 16-17).

Downlisting Criteria

The Sacramento prickly poppy will be considered for downlisting when:

1. Long-term protection of the populations from human threats on Forest Service, City of Alamogordo, and Bureau of Land Management lands, and on land affected by New Mexico State Highway Department activities has been ensured.
2. Reproducing populations of Sacramento prickly poppy within each of the 10 canyons occupied prior to 1994 on the western slope of the Sacramento Mountains are maintained.
3. Requirements for the germination and establishment of new individuals are determined.
4. Genetic variability within the subspecies is studied.

Delisting Criteria

Criteria for removing the Sacramento Prickly Poppy from the Endangered Species list cannot be determined at this time.

Synthesis

Since the recovery plan was published in 1994, several studies and regular monitoring of some occupied habitats have been conducted which have added greatly to our knowledge of this species (Worthington 2002; Barker 2006; Tonne 2008; USFWS 2004a, 2004b, 2005, 2008, 2009, 2012a, 2012b; USFS 2002, 2004, 2008, 2009, 2010, 2011). Field data have indicated that populations are likely extirpated from 3 canyons listed in the recovery plan (Dry, Mule, and La Luz Canyons), while 3 other occupied canyons (Marble, Gordon, and Deadman) were not named at the time of the original recovery plan (USFWS 2013). Thus, it appears that some fluctuations in occupancy within these canyon systems occur over time and the impact on population dynamics continues to not be well understood. Therefore, occupancy within the 10 specific canyons named in the original recovery plan may not be the most appropriate for recovery.

In addition, Sacramento prickly poppy populations are continuing to decline due to the interaction of a variety of factors including floods, drought, livestock impacts, disease, water diversion, and road and pipeline maintenance (USFWS 2004a, 2012; Tonne 2008). Therefore, threats to this increasingly narrow endemic species have increased since time of listing in 1989 and since the 1994 Sacramento Prickly Poppy Recovery Plan was published (USFWS 2013).

AMENDED RECOVERY CRITERIA

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or no longer meets the definition of an endangered or threatened species and may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from endangered to threatened. The term “endangered species” means any species (species, sub-species, or distinct population segment) which is in danger of extinction throughout all or a significant portion of its range. The term “threatened species” means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

We provide both downlisting and delisting criteria for the Sacramento prickly poppy, which will supersede those included in the 1994 Sacramento Prickly Poppy (*Argemone pleicantha* spp.) Recovery Plan, as follows:

Downlisting Recovery Criteria

The Sacramento prickly poppy will be considered for downlisting when:

1. The Alamo-Caballero Canyon population is shown to be stable or improving over a 20-year period with at least 1,000 individuals (flowering adults) according to the following measures:
 - a) The Alamo-Caballero Canyon population has been designated as the core recovery population. The Alamo-Caballero Canyon population includes all individuals (flowering adults) located with these two canyon systems. This core population will

- be monitored yearly using annual demographic trend monitoring at representative sites to provide a population estimate based on methodology peer-reviewed by species experts and approved by the Service. The 20-year monitoring period will accommodate for periods of fluctuation in population size or years when monitoring may not be possible.
- b) Approximately every 5 years, range wide and peripheral counts within Alamo and Caballero Canyons will be conducted using standardized methods peer-reviewed by species experts and approved by the Service.
 - c) Species presence and abundance is maintained at the aforementioned level within the core Alamo-Caballero Canyon population. The population shall be considered stable when a linear regression analysis (or other method which has been peer-reviewed by species experts and approved by the Service) of the population numbers estimated from the results of annual demographic monitoring reveals no significant decline in numbers.
 - d) A population viability analysis (PVA) (or other appropriate method which has been peer-reviewed by species experts and approved by the Service) will be conducted to determine the demographic parameters necessary to maintain a *resilient* population. A resilient population is one that is able to maintain approximately a 95% likelihood of persistence over a 100-year period (or other appropriate period of time which has been peer-reviewed by species experts and approved by the Service). Based on the PVA, the recovery criteria would be reassessed or adjusted to establish an accurate population number to achieve a resilient population, if necessary.

Justification: These criteria establish a resilient core population which is able to withstand the threat of demographic and environmental stochasticity.

- 2. The 7 additional canyon systems (outside of Alamo-Caballero Canyon), which represent the currently-known occupied habitat for the Sacramento prickly poppy, are shown to maintain stable or improving occupancy over a 20-year period with at least 50% of the canyons demonstrating an average of 75% probability of occupancy over this time frame, according to the following measures:
 - a) Maintain or increase occupied and high probability of occupancy habitat within these canyon systems.
 - b) These additional canyon systems will be surveyed at least once every 2 years utilizing annual occupancy monitoring at representative sites within each canyon to provide a probability of occupancy for the canyon based on methodology peer-reviewed by species experts and approved by the Service. The 20-year monitoring period will accommodate for periods of fluctuation in population size or years when monitoring may not be possible.
 - c) Occupancy is maintained at 75% probability of occupancy within at least 50% of the additional canyon systems. The canyon systems shall be considered stable when occupancy analysis based on methodology peer-reviewed by species experts and approved by the Service reveals no significant decline in occupancy.

- d) As well as demonstrating no significant decline in occupancy, each canyon system should maintain functionality over the 20-year period with appropriate demonstrated population dynamics as defined by methodology peer-reviewed by species experts and approved by the Service.
- e) Approximately every 5 years, efforts to characterize occupied and high probability of occupancy habitat throughout the canyon systems should be conducted based on methodology peer-reviewed by species experts and approved by the Service.
- f) A population viability analysis (PVA) (or other appropriate method which has been peer-reviewed by species experts and approved by the Service) will be conducted to determine the demographic parameters necessary to maintain *resiliency* across these additional populations. A resilient population is one that is able to maintain approximately a 95% likelihood of persistence over a 100-year period (or other appropriate period of time which has been peer-reviewed by species experts and approved by the Service). Based on the PVA, the recovery criteria would be reassessed or adjusted to establish an accurate population number to achieve a resilient population, if necessary.

Justification: The criteria ensure redundancy through establishing stable patterns of occupancy for Sacramento prickly poppy in 7 additional canyon systems.

- 3. The genetic corridors between populations are maintained through patterns of occupancy within different canyon systems to promote gene transfer as defined by methodology peer-reviewed by species experts and approved by the Service.

Justification: These criteria ensure genetic and ecological representation of Sacramento prickly poppy across large portions of its range.

- 4. The Alamo/Caballero Canyon populations, as well as populations within additional canyon systems considered occupied habitat, must be protected through the development and implementation of species-specific management recommendations that protect the species from identified threats (e.g., livestock grazing and water extraction).
 - a. These management recommendations should be developed in coordination with the Service and implemented by the appropriate land management entity (entities).
 - b. These management recommendations should be periodically evaluated (i.e., at least every 2 years) to ensure effectiveness and success in protecting the species from identified threats.

Justification: These criteria will help ameliorate threats to the Sacramento prickly poppy via management actions.

Delisting Recovery Criteria

The Sacramento prickly poppy will be considered for delisting when:

1. The Alamo-Caballero Canyon population is shown to be stable or improving over a 20-year period with at least 1,500 individuals (flowering adults) according to the following measures:
 - a) The Alamo-Caballero Canyon population has been designated as the core recovery population. The Alamo-Caballero Canyon population includes all individuals (flowering adults) located with these two canyon systems. This core population will be monitored yearly using annual demographic trend monitoring at representative sites to provide a population estimate based on methodology peer-reviewed by species experts and approved by the Service. The 20-year monitoring period will accommodate for periods of fluctuation in population size or years when monitoring may not be possible.
 - b) Approximately every 5 years, range wide and peripheral counts within Alamo and Caballero Canyons will be conducted using standardized methods peer-reviewed by species experts and approved by the Service.
 - c) Species presence and abundance is maintained at the aforementioned level within the core Alamo-Caballero Canyon population. The population shall be considered stable when a linear regression analysis (or other method which has been peer-reviewed by species experts and approved by the Service) of the population numbers estimated from the results of annual demographic monitoring reveals no significant decline in numbers.
 - d) A population viability analysis (PVA) (or other appropriate method which has been peer-reviewed by species experts and approved by the Service) will be conducted to determine the demographic parameters necessary to maintain a *resilient* population. A resilient population is one that is able to maintain approximately a 95% likelihood of persistence over a 100-year period (or other appropriate period of time which has been peer-reviewed by species experts and approved by the Service). Based on the PVA, the recovery criteria would be reassessed or adjusted to establish an accurate population number to achieve a resilient population, if necessary. The recovery criteria would be reassessed to establish more appropriate population numbers, if necessary.

Justification: These criteria establish a resilient core population which is able to withstand the threat of demographic and environmental stochasticity.

2. The 7 additional canyon systems (outside of Alamo-Caballero canyon) which represent occupied habitat for the Sacramento prickly poppy are shown to maintain stable or improving occupancy over a 20-year period with at least 75% of the canyons demonstrating an average of 75% probability of occupancy over this time frame, according to the following measures:
 - a) Maintain or increase occupied and high probability of occupancy habitat within these canyon systems.
 - b) These additional canyon systems will be surveyed at least once every 2 years utilizing annual occupancy monitoring at representative sites within each canyon to provide a

- probability of occupancy for the canyon based on methodology peer-reviewed by species experts and approved by the Service. The 20-year monitoring period will accommodate for periods of fluctuation in population size or years when monitoring may not be possible.
- c) Occupancy is maintained at the aforementioned levels within the additional canyon systems. The canyon system shall be considered stable when occupancy analysis based on methodology peer-reviewed by species experts and approved by the Service reveals no significant decline in occupancy.
 - d) As well as demonstrating no significant decline in occupancy, each canyon system should maintain functionality over the 20-year period with appropriate demonstrated population dynamics as defined by methodology peer-reviewed by species experts and approved by the Service.
 - e) Approximately every 5 years, efforts to characterize occupied and high probability of occupancy habitat throughout the canyon systems should be conducted based on methodology peer-reviewed by species experts and approved by the Service.
 - f) A population viability analysis (PVA) (or other appropriate method which has been peer-reviewed by species experts and approved by the Service) will be conducted to determine the demographic parameters necessary to maintain *resiliency* across these populations. A resilient population is one that is able to maintain approximately a 95% likelihood of persistence over a 100-year period (or other appropriate period of time which has been peer-reviewed by species experts and approved by the Service). Based on the PVA, the recovery criteria would be reassessed or adjusted to establish an accurate population number to achieve a resilient population, if necessary.

Justification: The criteria ensure redundancy through establishing stable patterns of occupancy for Sacramento prickly poppy in 7 additional canyon systems.

- 3. Genetic diversity is maintained within the core Alamo/Caballero canyon population, and throughout populations within canyon systems which are considered occupied habitat, according to the following measures:
 - a) The weak genetic divergence that has been observed between populations found in different canyon systems is maintained at a sufficient level to avoid any potential outbreeding depression as defined by methodology peer-reviewed by species experts and approved by the Service.
 - b) The genetic corridors between populations are maintained through patterns of occupancy within different canyon systems to promote gene transfer as defined by methodology peer-reviewed by species experts and approved by the Service.

Justification: These criteria ensure genetic and ecological representation of Sacramento prickly poppy across large portions of its range

- 4. The existing species-specific management recommendations (developed in coordination with the Service and implemented by the appropriate land management entity/entities) have been effective and successful in protecting the species over the 20-year period

required to reach the delisting criteria described above. In addition, all land managing agencies have developed a Post-Delisting Monitoring Plan (which has been approved by the Service's Southwest Regional Director) to cover a minimum of 5 years post-delisting of the species and are prepared to implement this plan prior to delisting to ensure the ongoing conservation of the listed species and the continuing effectiveness of management actions.

- a) In addition to this criterion, monitoring and research have been completed to conclude with a high degree of certainty that population sizes, quality, configuration, and management are adequate to provide a high probability of species survival (greater than 90 percent over 100 years).

Justification: These criteria will help ensure the continued amelioration of threats to the Sacramento prickly poppy via management actions.

All classification decisions consider the following five factors: (1) is there a present or threatened destruction, modification, or curtailment of the species' habitat or range; (2) is the species subject to overutilization for commercial, recreational scientific or educational purposes; (3) is disease or predation a factor; (4) are there inadequate existing regulatory mechanisms in place outside the Act (taking into account the efforts by states and other organizations to protect the species or habitat); and (5) are other natural or manmade factors affecting its continued existence. When delisting or downlisting a species, we first propose the action in the *Federal Register* and seek public comment and peer review. Our final decision is announced in the *Federal Register*.

Rationale for Recovery Criteria

While some of the existing downlisting recovery criteria are objective and measureable, the current targets set for recovery are inadequate based on recent trends and new information since the 1994 Recovery Plan and the 2013 5-year review. The 5-year review indicated that up to 3 of the 10 named canyons included in the 1994 Recovery Plan have become extirpated, while 3 other occupied canyons were not included in the 1994 Recovery Plan. Thus, maintaining populations in those specific 10 canyons may not be among the most important aspects for determining recovery of the poppy without some additional criteria in terms of trends in occupancy of those canyons. Since the 1994 Recovery Plan, new information has been presented regarding the requirements for germination and establishment of new individuals, as well as the genetic variability within the species. This new information would meet two of the original downlisting recovery criteria; however, data since the 1994 Recovery Plan also indicate a reduction of 57 percent in population numbers, indicating that the species is no closer to recovery than at the time of listing (USFWS 2013). In addition, the original delisting recovery criteria provided are not considered objective and measurable. These criteria refer to the lack of information to determine what will be required for delisting. Thus, these criteria needed to be re-evaluated and amended accordingly based on the best available science.

In the development of these amended recovery criteria, we used the three conservation biology principles of resiliency, representation, and redundancy (Shaffer and Stein 2000, pp. 306-310). Briefly, resiliency supports the ability of the species to withstand environmental and

demographic stochasticity; representation supports the ability of the species to adapt over time to long-term changes in the environment; and redundancy supports the ability of the species to withstand catastrophic events. The amended downlisting and delisting criteria number 1 are objective and measurable in relation to the concept of population resiliency. These criteria allow for the threat of demographic and environmental stochasticity to be mitigated through the establishment of a core population which is protected from random population fluctuations. The population abundance values (1,000 for downlisting and 1,500 for delisting) indicated in the amended criteria reflect species experts' opinions on the number of individuals needed within Alamo/Caballero Canyon population to establish population resiliency; these values are based on interpretations of population trends observed from previous years of monitoring. Population persistence over time will be achieved via stable or increasing demographic trends. The amended downlisting and delisting criteria number 2 are objective and measurable in relation to the concept of population redundancy. The criteria ensure a stable pattern of occupancy within the 7 additional canyons systems outside of Alamo/Caballero Canyon, which will provide redundancy. Redundancy provides for security against extinction from catastrophic events that could impact a single population by ensuring that one or more additional resilient, representative populations persist. The probability of occupancy values indicated in the amended criteria reflect species experts' opinions on the trends in occupancy necessary to maintain resiliency and redundancy within and among these populations. The amended downlisting and delisting criteria number 3 are objective and measurable in relation to the concept of population representation. These criteria ensure that Sacramento prickly poppy populations have genetic representation, while having Sacramento prickly poppy across large portions of their range ensures ecological representation. Diversity within and among populations should confer populations, and the species, greater resistance to pathogens and parasites and greater adaptability to environmental stochasticity (random variations, such as annual rainfall and temperature patterns) and environmental changes. The amended downlisting and delisting criteria number 4 are objective and measurable in relation to the concept of threats management. These criteria will help ensure management actions which ameliorate recognized threats and help to sustain the Sacramento prickly poppy in its natural habitat over a biologically meaningful timeframe within the conditions on the landscape and inherent biological limitations of the species.

Based on the best available information that includes the input and data from species experts during our recovery criteria review (developing the various methodologies stated in the amended recovery criteria), these amended recovery criteria provide quantifiable measures for identifying and implementing recovery actions, a means to measure progress towards recovery, and the ability to recognize when recovery will be achieved.

ADDITIONAL SITE SPECIFIC RECOVERY ACTIONS

Not applicable

COSTS, TIMING, PRIORITY OF ADDITIONAL RECOVERY ACTIONS

Not applicable

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APPENDIX A – SUMMARY OF PUBLIC, PARTNER, AND PEER REVIEW COMMENTS RECEIVED

Summary of Public Comments

The Service published a notice of availability in the *Federal Register* on January 31, 2019 (84 FR 790-795) to announce that the draft amendment for the Sacramento Prickly Poppy (*Argemone pleicantha ssp. pinnatisecta*) Recovery Plan (Recovery Plan) was available for public review, and to solicit comments by the scientific community, State and Federal agencies, Tribal governments, and other interested parties on the general information base, assumptions, and conclusions presented in the draft revision. An electronic version of the draft recovery plan amendment was also posted on the Service’s Species Profile website (<https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=3332>).

The Service received three responses to the request for public comments. These included comments from the Center for Biological Diversity, the Energy and Wildlife Action Coalition, and the Bureau of Land Management.

Public comments ranged from providing minor editorial suggestions to specific recommendations on the amendment content. We have considered all substantive comments; we thank the reviewers for these comments and to the extent appropriate, we have incorporated the applicable information or suggested changes into the final Recovery Plan amendment. In general, these comments did not lead to significant changes in the draft amendment. Below, we provide a summary of public comments received; however, some of the comments that we incorporated as changes into the final amendment did not warrant an explicit response and, thus, are not presented here.

Comment (1): Concern that, “criteria are being added in the absence of any scientific peer review and that this will lead to a failure on the Service’s part to follow the best-available science.”

Response: Peer review was conducted following the publication of the Notice of Availability, and in accordance with the requirements of the Endangered Species Act (Act). Below we provide a detailed summary of peer review comments and our responses, where appropriate.

Comment (2): Concern that, “the decision to update recovery criteria for these 42 species as a group is indicative of the Service moving away from utilizing recovery teams and outside scientific expertise.”

Response: Section 4 of the Act provides the Service with the authority and discretion to appoint recovery teams for the purpose of developing and implementing recovery plans. The current effort to update recovery plans with quantitative recovery criteria for what constitutes a recovered species is not indicative of the future need for, and does not preclude the future utilization of, recovery teams to complete recovery planning needs for listed species.

Comment (3): New and significant information has been developed in the years since the existing Recovery Plan was adopted. Updating this plan can serve to better inform the Service, the regulated community, and Federal, State, and local resource agencies.

Response: A recovery plan should be a living document, reflecting meaningful change when new substantive information becomes available. Keeping a recovery plan current increases its usefulness in recovering a species by ensuring that the species benefits through timely, partner-coordinated implementation based on the best available information.

Comment (4): The Service should consider whether the updated recovery criteria would be less burdensome on Federal agencies and the regulated community than the existing criteria.

Response: Recovery plans are guidance documents that outline how best to help listed species achieve recovery, but they are not regulatory documents. Recovery plans are intended to establish goals for long-term conservation of listed species and define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act.

Recovery criteria are achieved through the funding and implementation of recovery actions by both the Service and our partners. In addition to the existing recovery actions included in each of these recovery plans, the amendments address the need for any new, site-specific recovery actions triggered by the modification of recovery criteria, along with the costs, timing, and priority of any such additional actions. Because recovery plans are not regulatory documents, identification of an action to be implemented by any public or private party does not create a legal obligation beyond existing legal requirements. Nothing in a recovery plan should be construed as a commitment or requirement that any Federal agency obligate or provide funds.

Comment (5): The Service should consider whether the recovery criteria are achievable, because including unattainable recovery criteria could render such plans meaningless, or impede other processes under the Act.

Response: The National Marine Fisheries Service and U.S. Fish and Wildlife Service Interim Endangered and Threatened Species Recovery Plan Guidance (2010) emphasizes the development of recovery criteria that are specific, measurable, achievable, realistic, and time-referenced (SMART). The achievable component of SMART criteria implies that the authority, funding, and staffing needed to meet recovery criteria are feasible, even if not always likely. In developing recovery criteria specifically, we attempt to establish criteria that are both scientifically defensible and achievable to the greatest extent possible. At times, however, the feasibility of achieving certain criteria can be, or appear to be, constrained by the particular, difficult circumstances that face a species. Even in such cases, criteria serve to guide recovery actions and priorities for the species. Furthermore, as recovery progresses, periodic reevaluation of the species status through the 5-year review process may reveal that the barriers to achieving certain criteria have been removed or that circumstances or our understanding of the species have evolved. In that event, the Service can revise recovery criteria to ensure that they reflect the strategy most likely to succeed in the goal of recovery.

Comment (6): The Service should consider conservation efforts that have been put into place for the listed species since the previous iteration of the recovery plan, especially where the Service has supported conservation efforts, in formulating recovery criteria that will be established or amended by the revised draft plan.

Response: While section 4 of the Act directs the Service to specifically develop and implement recovery plans, several other sections of the Act and associated programs and activities also provide important opportunities to promote recovery. Information from these programs and activities about the biological needs of the species can inform recovery planning (including the formulation or revision of recovery criteria) and implementation. These conservation efforts have been considered during the development of this and other recovery plans.

Comment (7): The Service should determine whether ongoing species conservation efforts beneficially address one or more of the listing factors set forth in the Act implementing regulations addressing species listings and designation of critical habitat.

Response: All Service decisions that affect the listed status or critical habitat designation of a particular species, including our 5-year review of each listed species, are made by analyzing the five factors described in section 4 of the Act. Such an analysis necessarily includes an assessment of any conservation efforts or other actions that may mitigate or reduce impacts on the species. While our objective with this particular effort was to establish objective, measurable criteria for delisting, conservation actions play a crucial role in determining if and when those criteria have been satisfied.

Comment (8): The Service should be mindful of the impacts that recovery plan criteria can have on the section 7 process of the Act for the regulated community, because the Service and other Federal resource agencies sometimes request that recovery criteria be addressed in biological assessments and other planning processes under the Act addressing listed species.

Response: Recovery plans can both inform, and be informed by section 7 processes of the Act. When revising a recovery plan, existing section 7 consultations may provide helpful information on: recent threats and mechanisms to avoid, minimize, or compensate for impacts associated with those threats; a summarized status of the species; and indication of who important partners may be. Section 7 consultations can inform the need for revised recovery actions, recovery implementation schedule activities, recovery criteria, or species status assessments to provide more comprehensive recovery planning while the species remains listed.

Comment (9): The Service should include the full panoply of current information available for the species in all revised draft recovery plans.

Response: Our recovery planning guidance recommends that recovery planning be supported by compilation of available information that supports the best possible scientific understanding of the species. Although it is not necessary to exhaustively include all current information within the text of the recovery plan, to the extent that this information is specifically relevant and useful to recovery, the recovery plan may summarize such material or incorporate it by reference.

Supporting biological information may also be included within a species status assessment or biological report separate from the recovery plan document itself.

Comment (10): The Service should consider whether the existing recovery plan should be revised or replaced in its entirety rather than amended in part.

Response: Under guidance established in 2010, partial revisions allow the Service to efficiently and effectively update recovery plans with the latest science and information when a recovery plan may not warrant the time or resources required to undertake a full revision of the plan. To further gauge whether we had assembled, considered, and incorporated the best available scientific and commercial information into this recovery plan revision, we solicited submission of any information, during the public comment period, that would enhance the necessary understanding of the species' biology and threats, and recovery needs and related implementation issues or concerns. We believe the recovery plan amendment, which targets updating recovery criteria, is appropriate for the species. However, we will also continue to evaluate the accuracy and usefulness of the existing recovery plan with respect to current information and status of conservation actions, and may pursue a full revision of the plan in the future, if appropriate.

Comment (11): Commenter expressed the need for justification of the number values used for recovery criteria.

Response: The justification for the number values chosen within the recovery criteria is provided within the "Rationale for Recovery Criteria" section of the amendment.

Comment (12): Comment regarding the need to specify that management recommendations should be in the form of a management plan. Comment also suggested that these management actions should be proven effective and successful in protecting the species.

Response: We have added language to clarify who should develop and implement these management recommendations, as well as the need for evaluation of those recommendations to ensure effectiveness and success in protecting the species. The term "management recommendations" will remain and is intended to provide the flexibility to incorporate these recommended actions into a variety of different applicable documents which will guide the management and recovery of the species.

Comment (13): Comment on the need for a more comprehensive review of the species prior to finalizing the proposed amendment.

Response: We did elicit species' experts' opinions during the development of these criteria, along with eliciting peer review of the proposed amendment. A comprehensive review of the species was beyond the scope of this particular action and will most likely be completed in the future, in conjunction with a five-year status review.

Summary of Peer and Partner Review Comments

In accordance with the requirements of the Act, we solicited independent peer and partner review from the U.S. Forest Service and the New Mexico Energy, Minerals, and Natural Resources Department; academic and scientific groups and individuals; and any other party that may have possessed pertinent information. Peer review was conducted concurrent with the *Federal Register* publication. Criteria used for selecting peer reviewers included their demonstrated expertise and specialized knowledge related to the Sacramento prickly poppy (*Argemone pleiakantha pinnatisecta*) and endemic botanicals. The qualifications of the peer reviewers are in the decision file and the administrative record for this recovery plan amendment.

In total, we solicited review and comment from six peer reviewers and one partner reviewer. We received comments from two peer reviewers and no partner reviews. Peer reviewers that responded included representatives from one Federal agency (Bureau of Land Management) and one State agency (New Mexico Energy, Minerals, and Natural Resources Department). In general, the draft amendment was well-received by the peer reviewers and garnered positive comments. Several reviewers provided additional specific information, including documents or citations; we thank the reviewers for these data and we have added the information where appropriate.

We considered all substantive comments, and to the extent appropriate, we incorporated the applicable information or suggested changes into the final Recovery Plan amendment. Below, we provide a summary of specific comments received from peer reviewers with our responses; however, we addressed many of the reviewers' specific critiques and incorporated their suggestions as changes to the final amendment. Such comments did not warrant an explicit response, and as such, are not addressed here. We appreciate the input from all commenters, which helped us to consider and incorporate the best available scientific and commercial information during development and approval of the final Recovery Plan amendment.

Peer Review Comment (1): Reviewer noted a change in the scientific name from the 1994 *Argemone pleiakantha spp.* to the 2010 *Argemone pleiakantha pinnatisecta* (Cervantes et al. 2010).

Response: We added information to the final recovery plan amendment to adequately represent the change in scientific name for this species.

Peer Review Comment (2): Comment regarding specifying the term "individuals" which is used throughout the recovery criteria. Comment also requested a justification for the number values in the recovery criteria.

Response: We have changed the recovery criteria in order to define the term "individuals" to mean "flowering adults". The justification for the number values chosen within the recovery criteria is provided within the "Rationale for Recovery Criteria" section of the amendment.

Peer Review Comment (3): Comment expressing concern with the number values used in the recovery criteria regarding whether those numbers would represent a viable population.

Response: In order to address any concern regarding the number values specified and whether these values truly represent a viable population, we have included the flexibility within the recovery criteria to conduct a population viability analysis (or other appropriate method) in order to modify these number values if deemed necessary.

Peer Review Comment (4): Comments regarding the vagueness of recovery criteria related to probability of occupancy

Response: Probability of occupancy is defined as an informed estimate of species occupancy within a given area after taking into consideration detection probability. Since we do not have recent, reliable information regarding the abundance of the species within each of the other canyon systems outside of Alamo/Caballero in order to adequately establish abundance criteria for these canyons, we have chosen an occupancy-based approach for determining recovery. By establishing a standard of occupancy throughout these other canyon systems, we can ensure adequate representation of the species across its range. If in the future, further research determines that a specific number of plants within these canyons is necessary for recovery, an occupancy-based approach can accommodate for that modification.

Peer Review Comment (5): Comment regarding the vagueness of recovery criteria related to genetic corridors.

Response: While we understand the desire to have these terms defined within the recovery criteria, the intent of this criteria is to allow for the development of appropriate methodology to quantify this population characteristic. We intend for these terms to be defined and quantified during the development of this protocol, which will be determined in coordination with species experts.

Peer Review Comment (6): Comment regarding the need to specify that management recommendations should be in the form of a management plan. Comment also suggested that these management actions should be proven effective and successful in protecting the species.

Response: Comment regarding the effectiveness and success of these management recommendations is well justified. In response, we have added language to clarify who should develop and implement these management recommendations, as well as the need for evaluation of those recommendations to ensure effectiveness and success in protecting the species. Comment on the need to include a management plan is noted. While the sentiment of this comment is understood, the term “management recommendations” will remain and is intended to provide the flexibility to incorporate these recommended actions into a variety of different applicable documents which will guide the management and recovery of the species.

Peer Review Comment (7): Comment regarding the lack of clarity of the statement “consistent with land uses in the area” in regards to management recommendations.

Response: This qualifier is not necessary for the intent of the recovery criteria and it has been removed.

Peer Review Comment (8): Comment regarding the need to extend the length of time for the post-delisting monitoring plan from 5 years to at least 10 years.

Response: The Endangered Species Act requires a minimum timeframe of 5 years for post-delisting monitoring. We will consider a longer period if appropriate, at the time a post-delisting monitoring plan is developed.

Peer Review Comment (9): Comment regarding the number values used for downlisting and delisting criteria which referenced the highest known population level of 1,000 plants at the time of listing and suggests that this recovery criteria likely does not represent a viable population.

Response: Based on available data, the highest known population of approximately 1,000 plants included all canyon systems where the plan is present. The downlisting and delisting recovery criteria which uses the numbers of 1,000 and 1,500, respectively, only refers to those plants present within Alamo and Caballero Canyons. Other criteria call for adequate representation within other canyon systems, as well. Thus, we feel that these number values are appropriate. In order to incorporate any future need for adjustments, the recovery criteria also include the ability to adjust these number values based on the results of a population viability analysis (or other appropriate methodology).

Peer Review Comment (10): Comment regarding concern over the use of a population viability analysis.

Response: We understand that population viability analysis can be highly controversial and are highly dependent on the collection of appropriate data often over a long time frame. For this reason, we have included the option of using another appropriate methodology to assess population resiliency within the recovery criteria. This will allow the Service to coordinate with species experts to determine the most appropriate means to evaluate the status of the population and its future needs.

Peer Review Comment (11): Comment expressing hesitancy with the approach of using number values for recovery.

Response: The use of quantitative values for recovery criteria ensures that the criteria are measurable, so that the species status and recovery progress can be assessed.

Peer Review Comment (12): Comment suggesting convening a group of plant experts to reach consensus on recovery criteria.

Response: In our efforts to create these criteria, species experts were consulted on multiple occasions and comments were incorporated.

Peer Review Comment (13): Comment regarding the use of “abundance” criteria as an indicator of resiliency. Comment suggests using “stable demographic structure”.

Response: The quantitative recovery criteria is based on best available science using Resiliency, Redundancy, and Representation (3 R's). The 3 R's method looks at the species abundance across the range of the species and whether it can withstand environmental stochasticity. Distribution is another component that is considered to see if sub-populations are geographically separated and can withstand catastrophic events. The species diversity of being geographically separated may have adaptive characteristics that will help a species persist into the future. Resiliency refers to the population size necessary to endure stochastic environmental variation (Shaffer and Stein 2000:308-310). Abundance is well-documented in the literature as a measure of resiliency (Shaffer and Stein 2000, Walpes et al. 2013, Wolf et al. 2015). The 3 R's is the "best available science" that the Service uses in Species Status Assessments and the 3 R's have been defined (Carroll et al. 2010, Wolf et al. 2015). The citation indicated in this comment is specific to the USDA/USFS not the U.S. Fish and Wildlife Service. The recovery criteria creates a framework of what is needed for the species recovery. Different agencies may approach monitoring differently, due to numerous reasons, resulting in multiple appropriate methods. Consultation will still be necessary for this species by all appropriate agencies. Finally, as public servants, we are tasked with making our decisions transparent for the American public so private individuals, who may not have a science background, can understand the process. Abundance is a widely understood term that encompasses a variety of more technical survey methods.