Sacramento Prickly Poppy
(*Argemone pleiacantha* spp. *pinnatisecta*)
5-Year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office
Albuquerque, New Mexico

September 30, 2022

5-YEAR REVIEW
Sacramento Prickly Poppy (*Argemone pleiacantha* spp. *pinnatisecta*)

1.0 GENERAL INFORMATION

1.1 Reviewers:

Lead Regional or Headquarters Office: Southwest Regional Office, Albuquerque, New Mexico
Angela Anders, Branch Manager, Recovery and Restoration, Ecological Services, (505) 248-7953
Janess Vartanian, Recovery Biologist, Recovery and Restoration, Ecological Services, (505) 248-6657

Lead Field Office: New Mexico Ecological Services Field Office, Albuquerque, New Mexico
Janelle Alleman, Fish and Wildlife Biologist, Terrestrial and Aquatic Ecosystem Conservation Branch, Ecological Services, (505) 761-4707

1.2 Purpose of 5-Year Reviews:

The U.S. Fish and Wildlife Service (Service or USFWS) is required by section 4(c)(2) of the Endangered Species Act (ESA) to conduct a status review of each listed species once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, be changed in status from endangered to threatened, or be changed in status from threatened to endangered. Our original listing as endangered or threatened is based on the species' status considering the five threat factors described in section 4(a)(1) of the ESA. These same five factors are considered in any subsequent reclassification or delisting decisions. In the 5-year review, we consider the best available scientific and commercial data on the species and focus on new information available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process including public review and comment.

1.3 Methodology used to complete the review:

The Service provided notice of this species status review via the Federal Register (87 FR 5834) and requested new information on the status of the species (e.g., life history, habitat conditions, and threats). Data for the Sacramento prickly poppy (poppy) were solicited from interested parties through this Federal Register notice, but no new information was received from this solicitation. The Service's New Mexico Ecological Services Field Office conducted this review using the best information available and considered both new and previously existing information from federal and state agencies, non-governmental organizations, and academia. This review includes information from the previous 5-year

review (USFWS, 2013) that is still applicable to the poppy, with updated or new information incorporated, as appropriate. We use a variety of information resources including monitoring reports, surveys, academic publications, and conversations with biologists familiar with the poppy. Literature and documents used for this 5-year review are on file at the New Mexico Ecological Services Field Office. All recommendations resulting from this review are a result of thoroughly reviewing the best available information on the poppy and the Service did not seek additional peer review for this updated review.

Recent molecular and geographic data (Cervantes et al., 2010) support a scientific name change for the Sacramento prickly poppy from *Argemone pleiacantha* spp. *pinnatisecta* to *Argemone* pinnatisecta, which was documented in the previous 5-year review for the poppy (USFWS, 2013). However, the scientific name has yet to be changed in the List of Endangered and Threatened Wildlife and Plants (50 CFR 17.12) and associated recovery documents. Therefore, we will use the sub-species name (*Argemone pleiacantha* spp. *pinnatisecta*) in this 5-year review.

1.4 Background:

1.4.1 Federal Register (FR) Notice citation announcing initiation of this review:

87 FR 5834; Endangered and Threatened Species: Initiation of 5-Year Status Reviews of 35 Species in the Southwest; February 2, 2022.

1.4.2 Listing history:

Original Listing
FR notice: 54 FR 35302
Date listed: August 24, 1989
Entity listed: Species, Sacramento Prickly Poppy (*Argemone pleiacantha* spp. *pinnatisecta*)
Classification: Endangered, without critical habitat

Revised Listing, if applicable
FR notice: N/A
Date listed: N/A
Entity listed: N/A
Classification: N/A

1.4.3 Associated Rulemakings:

No new information.

1.4.4 Review History:

The U.S. Fish and Wildlife Service conducted a 5-year review for this species in August, 2013 (USFWS 2013). No change in status was recommended.

1.4.5 Species' Recovery Priority Number at start of 5-year review:

The Recovery Priority Number is 5C indicating an endangered species with a high degree of threat and low recovery potential.

1.4.6 Recovery Plan or Outline

Name of plan or outline: Sacramento Prickly Poppy (*Argemone pleiacantha* spp. *pinnatisecta*) Recovery Plan
Date issued: August 31, 1994
Dates of previous plans/amendment or outline, if applicable: The recovery plan has not been revised.

2.0 REVIEW ANALYSIS

Section 4 of the ESA (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of "endangered species" or "threatened species." The ESA 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 ESA requires that we determine whether a species meets the definition of "endangered species" or "threatened species" due to any of the five factors described below.

The identification of any threats does not necessarily mean that the species meets the statutory definition of an "endangered species" or a "threatened species." In assessing whether a species meets either definition, we must evaluate all identified threats by considering the expected response of the species, 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 Service recommends 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.

2.1 Distinct Population Segment (DPS) policy (1996):

The ESA defines "species" as including any subspecies of fish or wildlife or plant, and any distinct population segment of any species of vertebrate wildlife. This definition limits listing Distinct Population Segments (DPS) to only vertebrate species of fish and wildlife. The Distinct Population Segment Policy does not apply to *A. pleiacantha* spp. *pinnatisecta* because it is not a vertebrate animal.

2.2 Updated Information and Current Species Status

2.2.1 Biology and Habitat

2.2.1.1 New information on the species' biology and life history:

The Sacramento prickly poppy is an herbaceous perennial that lives approximately seven to nine years. The species often dies back to the root crown each year when moisture is limited. Mature plants can be large and vigorous for multiple years, and then can remain dormant in a subsequent year. Germination has been observed to occur between October and November, through late winter into spring, and in August. Successful recruitment into the population requires sufficient moisture for the establishment of seedlings (USFWS, 2013). Seedlings grow slowly, producing a juvenile rosette the first year. Seedlings are delicate, susceptible to desiccation, and may be dislodged by floods or livestock trampling. Young plants typically occupy open, disturbed habitat with minimal competing vegetation and a reliable water source (USFWS, 1994).

The poppy is endemic to several canyons along the western face of the Sacramento Mountains of Otero County in south-central New Mexico (USFWS, 1994). This entire range is estimated at 230 square kilometers (90 square miles). Habitat for the poppy extends through a variety of plant biotic communities within the Sacramento Mountains. The species occurs in steep, rocky canyons between the pinyon/juniper zone of the Chihuahuan Desert Scrublands and Grasslands (1,310 m [4,300 ft]) and the lower edge of the ponderosa pine community of the Great Basin Conifer Woodlands (2,164 m [7,100 ft]) (Brown, 1982; USFWS, 1994).

The species' known historical range covered 13 canyons in 8 canyon systems of the Lincoln National Forest (LNF). Populations existed in Fresnal Canyon, including Salado and La Luz canyons; Dry Canyon; Marble Canyon; Alamo Canyon, including Caballero, Gordon, and Deadman canyons; Mule Canyon; San Andres Canyon; Dog Canyon; and Escondido Canyon. Currently, poppies are known to be extant in 11 of these canyons. The species is also known to occur on Bureau of Land Management lands, private lands, Oliver Lee State Park, and on State of New Mexico and City of Alamogordo rights-of-way.

2.2.1.2 Abundance, population trends (e.g., increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, birth rate, seed set, germination rate, age at mortality, mortality rate, etc.), or demographic trends:

Little new information is available on this species' population trend since the previous 5-year review was completed in 2013 (USFWS, 2013). New data on the poppy was provided by the LNF and included survey data that were

collected from 2013 to 2019. These data show that counts of adult prickly poppy in Alamo and Caballero canyons have fluctuated each year but remained relatively static between 2016 and 2019. While the most current survey data do not show as steep of a decline as was documented in the last 5-year review (62 percent over 23 years; USFWS, 2013), the species still appears to be declining in the number of adults at sites that were surveyed. The surveys conducted did not document many seedling or sub-adult poppies, which may indicate that recruitment is not occurring or some unknown threat is affecting adult poppy reproduction ability. Alternatively, the apparent lack of recruitment could be associated with difficulties in locating seedlings, especially in areas that other vegetation is dense, resulting in under reporting of seedling and sub-adult poppies.

Since the last 5-year review, survey efforts have occurred sporadically and advantageously across known poppy sites rather than systematically across all poppy sites. Inconsistent survey of poppy sites makes it difficult to determine if poppies are persisting at all previously known sites, if these populations are remaining relatively static as seen in Alamo and Caballero canyons, or if a population may have been extirpated from some sites. In 2018, data were collected in 6 canyons, indicating that the species continues to persist at these locations, though two sites had less than 5 individuals and no documentation of recruitment. Only Alamo and Caballero canyons were re-surveyed in 2019.

2.2.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) for genetics information as no new information is known at this time.

2.2.1.4 Taxonomic classification or changes in nomenclature:

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) for taxonomic classification and nomenclature information as no new information is known at this time.

2.2.1.5 Spatial distribution, trends in spatial distribution (e.g., increasingly fragmented, increased numbers of corridors, pollinator availability, etc.), or historic range (e.g., corrections to the historical range, change in distribution of the species' within its historic range, etc.):

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) for spatial distribution information as no new information is known at this time.

2.2.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) for habitat condition information as no new information is known at this time.

2.2.1.7 Other:

No new information.

2.2.1.8 Conservation Measures:

Refer back to the 1989 listing rule and previous 5-year review (USFWS, 2013) for information on conservation measures as no new conservation measures are known at this time.

2.2.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms):

Current and potential future threats to the Sacramento prickly poppy remain largely unchanged from the time of listing and include water availability and development (Factors A, D, E), grazing (Factors A and D), recreation use (Factors A and D), on-going surface disturbance (Factors A, E), invasive or non-native plant species (Factors A, C, D, E), and herbicide application (Factors A and E).

2.2.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) as no new information is known at this time.

2.2.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) as no new information is known at this time.

2.2.2.3 Disease or predation:

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) as no new information is known at this time.

2.2.2.4 2.2.2.7 Inadequacy of existing regulatory mechanisms:

Refer to the 1989 listing rule and previous 5-year review (USFWS, 2013) as no new information is known at this time.

2.2.2.5 Other natural or manmade factors affecting its continued existence:

In New Mexico, mean annual temperature has increased by 0.6 degrees per decade beginning in 1970, with warming the greatest in the spring (Lenart, 2005). Wind patterns and rates of evaporation, along with aspects of extreme weather such as droughts, severe rainstorms with intense runoff, and temperature fluctuations, are expected to be more pronounced and variable (IPCC, 2007). Drought conditions have been detected in the Sacramento Mountains over the past decade, with most years starting with abnormally dry conditions that progress into severe and/or extreme drought conditions by the end of the year (Bathke, 2022). Higher temperatures lead to higher evaporation rates which may reduce the amount of runoff, groundwater recharge, and spring discharge (Stewart et al., 2004). Decreased water flows and duration of available water in poppy habitat may result in the contraction of the number and extent of areas occupied by the Sacramento Mountains prickly poppy. As temperature changes, seasonal shifts may stimulate earlier growth in the spring or extend the growing season into the fall when moisture is less available. Flowering phenology may also be affected by temperature shifts, potentially causing asynchronous relationships with pollinators and reducing sexual reproduction of plants (Kudo and Cooper, 2019). Collectively, drought may not only reduce the area, availability, and quality of habitat for the poppy but may also compound the effects of other potential threats such as non-native plant competition, insect predation, and pollinator availability, threatening the viability of the species into the future and across its range.

2.3 Synthesis

Overall, the Sacramento prickly poppy appears to be continuing to decline across all known locations though potentially to a lesser degree that has been seen in the previous 5-year review (USFWS, 2013). Because surveys have been conducted sporadically across known poppy sites, we are not able to accurately determine the status of the poppy range wide and if all sites that were occupied in 2013 are still occupied today. Additionally, sites that were surveyed for poppies between 2013 and 2019 showed little recruitment of the species, though this may be because surveying for seedlings has been documented to be difficult, especially in areas with dense vegetation.

Threats to this species remain the same as those discussed in the previous 5-year review (USFWS, 2013) and we are unaware of any new management plans or conservation measures that have been implemented since 2013. Drought has likely played an increasing role in the number and distribution of Sacramento prickly poppy by reducing overall habitat availability, although the role that drought has played in reducing the availability of habitat and resources has yet to be studied fully for the poppy.

3.0 RESULTS

3.1 Recommended Classification:

____Downlist to Threatened
____ Uplist to Endangered
____ **Delist** (*Indicate reasons for delisting per 50 CFR 424.11):*
____ *Extinction*
____*Recovery*
____*Original data for classification in error*
__X_ **No change is needed**

3.2 New Recovery Priority Number (indicate if no change; see 48 FR 43098):

No change recommended.

Brief Rationale:

We are not recommending a change to the Recovery Priority Number because threats to the prickly poppy remain unchanged from the previous 5-year review (USFWS, 2013) and the species appears to still be declining. The current Recovery Priority Number of 5C is indicative of a full species with a high degree of threat and low recovery potential. The best way to conserve or recover this species is still not fully know, supporting the low recovery potential, as indicated by the Recovery Priority Number of 5. Maintaining the conflict designation (C) is necessary since threats to the species continue to exist including water development, livestock herbivory, and herbicide treatments. These types of threats could be reduced if landowners implemented appropriate management actions (e.g., limit water diversions or quantities used, reduce livestock impacts, and protect poppy habitat). Other threats to the species, including continued drought, are unlikely to be influenced by management actions. A complete explanation for the decline in the number of reproductive individuals over the past 10 years remains largely unknown and is possibly attributed to the continuation of drought across the southwest or other unforeseen threats.

3.3 Listing and Reclassification Priority Number, if reclassification is recommended (see 48 FR 43098):

Reclassification (from Threatened to Endangered) Priority Number: N/A
Reclassification (from Endangered to Threatened) Priority Number: N/A
Delisting (Removal from list regardless of current classification) Priority Number: N/A

Brief Rationale:

N/A

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

Establishing a specific survey protocol, methodology, and monitoring schedule to document population trends and gain an accurate assessment of population size and extent would be beneficial for the poppy. Additionally, threats that could be managed through landowner action such as livestock herbivory and water development/diversion should be reduced to the maximum extent practical and monitored to determine existing and on-going impacts to the Sacramento prickly poppy and its habitat. A species status assessment to inform a recovery plan revision should, when workload permits, be conducted to incorporate new information on the species.

Research is needed to better understand best practices that would support restoring the poppy throughout its range and to identify habitat requirements of the species. This research should include analyzing the long-term viability of the poppy to determine if inbreeding depression or other factors may exist that are limiting poppy fecundity and recruitment and develop management recommendations that could prevent the continued decline in poppy population size and resilience. Investigation is also needed to determine if the acquisition of water rights under the existing water rights law established by the state of New Mexico is possible to protect habitat for the Sacramento prickly poppy.

5.0 REFERENCES

Bathke, D. 2022. National Drought Mitigation Center - U. S. Drought Monitor – West. https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?West. Accessed July 11, 2022.

Brown, D. 1982. Biotic Communities of the American Southwest. University of Arizona Press, Tucson, Arizona.

Cervantes, S.D., P. Tonne, R. Govindarajulu, P.J. Alexander, and C.D. Bailey. 2010. Population Genetic Analysis of *Argemone pleiacantha* subsp. *pinnatisecta* (Sacramento Prickly Poppy, Papaveraceae) and Re-Evaluation of its Taxonomic Status. Journal of theBotanical Research Institute of Texas 4(1):261–269.

International Panel on Climate Change (IPCC). 2007. Regional Climate Projections. *In*: Climate Change: The Physical Science Basis. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom. Pages 848-940.

Kudo, G. and E.J. Cooper. 2019. When spring ephemerals fail to meet pollinators: mechanisms of phenological mismatch and its impact on plant reproduction. Proceedings of the Royal Society. 286:20190573. pp. 9.

Lenart, M. 2005. Is global warming creeping into Southwest Forests? Southwest Climate Outlook. February, 2005. pp.4.

Overpeck, J. 2008. Climate Change in the Southwestern US: Mechanisms, Evidence and Projections. Presented at the New Mexico Climate Change Ecology and Adaptation Workshop. October 22, 2007. Albuquerque, New Mexico.

Stewart, I., D.R. Cayan, and M.D. Dettinger. 2004. Changes in snowmelt runoff timing in western North America under a 'Business as Usual' climate change scenario. Climatic Change. 62:217-232. pp. 16.

U.S. Fish and Wildlife Service. 1994. Sacramento Prickly Poppy (*Argemone pleiacantha* ssp. *pinnatisecta*) Recovery Plan. Albuquerque, New Mexico. 42 pp.

U.S. Fish and Wildlife Service. 2013. Sacramento Prickly Poppy (*Argemone pinnatisecta*). 5-Year Review: Summary and Evaluation. Albuquerque, New Mexico. pp. 45.

U.S. FISH AND WILDLIFE SERVICE

5-YEAR REVIEW of

Sacramento Prickly Poppy (*Argemone pleiacantha* spp. *pinnatisecta*)

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
__X_ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: N/A

Review Conducted By: Janelle Alleman, Fish and Wildlife Biologist

FIELD OFFICE APPROVAL:

Lead Field Supervisor (Acting), Fish and Wildlife Service, New Mexico Ecological Services Field Office

Approve JODIE MAMUSCIA Digitally signed by JODIE MAMUSCIA Date: 2022.09.30 14:03:45 -06'00'