U.S. FISH AND WILDLIFE SERVICE
5-YEAR STATUS REVIEW
Winkler cactus (*Pediocactus winkleri*)
and
San Rafael cactus (*Pediocactus despainii*)

GENERAL INFORMATION:

Species:

Winkler cactus (*Pediocactus winkleri*)
San Rafael cactus (*Pediocactus despainii*)

Date listed:

Winkler cactus – August 20, 1998 (63 FR 44587)
San Rafael cactus – September 16, 1987 (52 FR 34914)

Federal Register Notice of Listing Determination:

Winkler cactus – 63 FR 44587
San Rafael cactus – 52 FR 34914

Classification:

Winkler cactus – Threatened
San Rafael cactus – Endangered

Most recent status review:

5-Year Review for Winkler cactus (*Pediocactus winkleri*) and San Rafael cactus (*Pediocactus despainii*). 2019. U.S. Fish and Wildlife Service, Utah Ecological Services Field Office. West Valley City, Utah. 8 pp. Finalized 8/29/2019.

Federal Register Notice citation announcing this 5-year status review:

88 FR 15448. March 13, 20239. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 27 Listed Species in the Mountain-Prairie Region.

Lead Region:

Mountain-Prairie Region (Region 6)

Current Recovery Priority Number (RPN):

Winkler cactus- 11C
San Rafael cactus - 11

Methodology used to complete this review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973 (16 U.S.C Section 1531 *et seq*.), as amended (Act), the purpose of a 5-year status review is to assess each threatened and endangered species to determine whether its status has changed and if it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and

Plants. Status reviews are to be completed in accordance with Sections 4(a) and 4(b) of the Act (16 U.S.C. Section 1533(c)). This 5-year review was conducted by the U.S. Fish and Wildlife Service's (Service) Utah Ecological Services Field Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review on March 13, 2023. We also contacted the land managing agencies and the state natural heritage program to request any data or information we should consider in our review. Those contacted included the Bureau of Land Management Price and Richfield Field Offices, the Utah Native Plant Conservation Project, Manzanita Botanical Consulting, and Capitol Reef National Park. Additionally, we conducted a literature search and a review of information in our files.

This review is being completed in conjunction with a Biological Status Report for Winkler cactus (*Pediocactus winkleri*) and San Rafael cactus (*Pediocactus despainii*) (Service 2024), which will be used to update the Draft Recovery Plan (Service 2016). The Biological Status Report will contain the most updated and in-depth analyses for both species and will be available on https://ecos.fws.gov/ecp/, along with this review. We anticipate releasing a new Draft Recovery Plan in Fiscal Year 2025 and a Final Recovery Plan in Fiscal Year 2026 and the Biological Status Report will be updated with any new and relevant information when the Recovery Plan is finalized. This 5-year review will summarize only the most recent and pertinent information for status. For more detailed information on the status of Winkler cactus and San Rafael cactus, please see the Biological Status Report (Service 2024)

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This document was reviewed by:
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ASSESSMENT:

Summary of information acquired since the last status review – Winkler Cactus

For Winkler cactus we currently recognize three populations (Hartnet, Notom, Rock Springs) with 13,959 known individuals. Although the genetic analysis of Winkler and San Rafael cactus populations has not been finalized, we have continued to accept the results of the interim report (Wang 2018) in determining which populations are Winkler cactus and which are San Rafael cactus. We consider the Blue Bench population to be San Rafael cactus and we anticipated that the genetic report confirming this will be finalized in the next calendar year. We identified three population size categories based on the number of plants—small populations have 500 or fewer plants; medium populations have 501–1,000 plants; and large populations have more than 1,000 plants. Based on these categories, Winkler cactus has two large populations (Hartnet and Notom) and one small population (Rock Springs). Our total population count is more than double than what we reported in the 2016 draft recovery plan (5,700 plants) despite the removal of the Blue Bench population because it includes additional plants found on NPS lands in the Hartnet population (Livensperger and Borthwick 2020). Our population counts should be considered

conservative numbers erring on the low side of actual plant abundance since seedlings and dormant plants are difficult or impossible to detect during surveys (Clark 2011).

A recent population viability assessment for Winkler cactus did not identify a minimum viable population size for the species but instead evaluated the species response to various stressors (Hornbeck 2021). In the absence of various stressors (herbivory, livestock, illegal collection), Winkler cactus exhibits stable population growth rates and is highly drought tolerant. The survival of large plants is the primary contributor to population growth due to their higher reproductive output (Hornbeck 2021). There are two evaluations of population trend based on consistent, long-term monitoring of the Hartnet population on NPS lands (Hornbeck 2017, 2021). The first evaluation relied on a four-year dataset (2013 to 2016) within an active grazing allotment (October 15 to May 31 for up to 1,141 animal unit months (AUMs)) (Service 2018). Over this time-period, moderate and large sized plants exhibited reduced survival and reproduction compared to smaller plants, which resulted in a projected negative population trend for Winkler cactus regardless of whether livestock were present or absent (Hornbeck 2017). The reduced survival and reproduction of larger individuals was an important factor in the declining trend and suggests that the population structure in Capitol Reef National Park (CRNP) may have been negatively affected by livestock use prior to the four-year monitoring period and that larger plants appear to be highly sensitive to damage and disturbance.

The second evaluation of population trend relied on a longer, seven-year dataset (2013 to 2019) at the same location on NPS lands (Hornbeck 2021). Livestock were removed in May 2018 when the allotment was permanently retired from livestock grazing. Livestock trailing is now permitted (two to four days per year) within CRNP between grazing allotments on U.S. Forest Service (USFS) and BLM lands (Service 2018; Borthwick and Livensperger 2019). This evaluation included a post-hoc (developed after the fact) control for Winkler cactus using data from undamaged plants during the study period because controlled conditions (livestock exclusion) were not available.

The species has a projected stable to increasing population trend following livestock removal in 2018 in Capitol Reef National Park, provided other stressor were not acting significantly on the species as well. Livestock trampling resulted in negative effects to plant survival and reproduction, which is consistent with the earlier evaluation discussed above. Twenty-year projections of population trend indicated that a stable population can be achieved if trampling (by livestock or wild ungulates) affects less than five percent of the population on an annual basis (Hornbeck 2021). Winkler cactus has a high tolerance to drought, but an increase in drought frequency would compound the negative effects of other stressors. Model projections indicate that any stressor, alone or in combination, that results in a negative change to the annual average survival, growth, or reproduction by more than five to six percent would likely result in a negative 10-year population trend and higher extinction risk over 100-years (Hornbeck 2021).

Livestock grazing still occurs in Winkler cactus occupied habitat on BLM land and aside from a single paired plot study established in 1999 and monitored annually since 2013 (BLM 2024a) no other long-term monitoring data is available for Winkler cactus on BLM land. We recommend additional long-term monitoring and collection of information on seed bank dynamics to improve population trend projections.

In addition to grazing, we continue to recognize illegal collection as the primary threat to Winkler cactus. Climate change, recreation, roads and other construction, native ungulates, wild horses and burros, disease and predation, the inadequacy of regulatory mechanisms outside of the Endangered Species Act (ESA), and small population sizes are additional stressors that may act in combination with the primary threats to affect the status of the species. Little new information on how these threats and stressor are acting on Winkler cactus is available since the last 5-year review – see the Biological Status Report (Service 2024) for a complete summary of threats and stressors to Winkler cactus.

Summary of information acquired since the last status review – San Rafael Cactus

For San Rafael cactus, we recognize has 29 populations with 21,555 plants, including the Blue Bench population that was previously categorized as Winkler cactus (Wang 2018). We used the same three population size categories as Winkler cactus and consider there to be five large populations, 3 medium populations, and 21 small populations (Service 2024). The total population count is much larger than reported in the 2016 draft recovery plan (8,553 plants) because of an expanded survey effort by the BLM and the addition of the Blue Bench population in Sevier County (Service 2024). As with Winkler cactus, known population counts should be considered conservative numbers erring on the low side of actual plant abundance since seedlings and dormant plants are difficult or impossible to detect. It is also difficult to know in any given year whether a plant is dormant or dead (Clark 2011).

No long-term monitoring has been conducted for San Rafael cactus other than monitoring directly related to the Good Water Rim Trail designation. That monitoring has been conducted annually since 2019 and focuses on effects of the trail designation and corresponding increased recreation on San Rafael cactus (Service 2020). Recreation groups host an annual bike festival, which involves large numbers of people camping and bike riding (MECCA 2021). User compliance is poor within this population with extensive recreational use and unauthorized OHV use affecting 70 percent of cactus locations. When the BLM designated the Good Water Rim Trail as an official bike trail and established a maintenance corridor, three parking lots and trail pullouts to better address recreational use and reduce effects to San Rafael cactus on BLM and State lands (Service 2020). The BLM provides additional law enforcement and deed restrictions for special recreation permits (SRPs), such as the annual bike festivals, to hold permittees accountable to remedy adverse effects to the species. We anticipate receiving a summary of the monitoring results from the BLM next fiscal year, which may help inform a larger analysis of how San Rafael cactus responds to stressors.

A seedbank viability study and a rangewide long-term monitoring study, building off of the monitoring conducted at Good Water Rim, are planned to begin in Fiscal Year 2025 and are intended to provide species specific information on population viability for San Rafael cactus (Hornbeck 2024). Until that analysis is complete, we consider the recent population viability assessment for Winkler cactus to be a surrogate for San Rafael cactus when evaluating the species response to various stressors (Hornbeck 2021, Service 2024).

An additional factor that may affect the status of San Rafael cactus in the future are planned land exchanges between the BLM and the State of Utah under the Dingell Act (Pub. L. 116-9, "John D. Dingell, Jr. Conservation, Management, and Recreation Act"). We completed our consultation on the proposed land exchanges for San Rafael cactus in January 2024 and found that exchanges as proposed would result in a net increase in suitable habitat for San Rafael cactus managed by the BLM, as well as an additional 13,234 acres of occupied habitat and 720 recorded individuals moving from the management of the State of Utah to the BLM. Therefore, the effects from the exchange of these parcels would be beneficial to San Rafael Cactus and its habitat as the State of Utah is not required to protect plant species listed under the ESA or to consult with us on management actions that may affected listed plant species (Service 2024a). However, as of this writing none of the land exchanges for San Rafael cactus occupied or suitable habitat have been completed.

We also anticipate consulting on the BLM's San Rafael Travel Management Plan (TMP) in Fiscal Year 2025 (BLM 2024). This TMP has the potential to affect a large amount of San Rafael cactus habitat and individuals. Although all proposed routes in the TMP already exist on the ground, some are not designated for public use at this time and were either administrative or user-created routes. Officially designating them for public use is likely to increase travel and recreation in San Rafael cactus habitat. This has the potential to increase the effects of road and recreational use for San Rafael cactus. The degree to which it is affected will depend on the alternative selected by the BLM.

In addition to recreation and roads and other construction, we continue to recognize livestock grazing and illegal collection as the primary threats to San Rafael cactus. Climate change, native ungulates, wild horses and burros, disease and predation, the inadequacy of regulatory mechanisms outside of the ESA, and small population sizes are additional stressors that may act in combination with the primary threats to affect the status of the species. Little new information on how these other threats and stressors are acting on San Rafael cactus is available since the last 5-year review – see the Biological Status Report (Service 2024) for a complete summary of threats and stressors to San Rafael cactus.

Conclusion:

After reviewing the best available scientific information and recovery criteria, we conclude that Winkler cactus should remain as a threatened species and San Rafael cactus should remain as an endangered species. Our review of new information compiled since 2019 does not change our overall evaluation of the species' status and the threats affecting the species under the factors in 4(a)(l) of the Act from our most recent review, although there have been some alterations to scope and intensity of the existing threats (Service 2024). Our previous evaluation that Winkler cactus remains likely to become in danger of extinction across its entire range, and thus continues to meet the definition of a threatened species under the Act is supported by: the lack of knowledge about long-term population trends and recruitment rates; the continued current and potential threats, including those associated impacts by large animals (cattle and native ungulates) over a large portion of the species range; removal by collectors; the projected impacts of climate change; and the small known population size. Grazing intensity and scope remains an active threat for greater than half the population.

Our previous evaluation that San Rafael cactus remains likely to become extinct across its entire range, and thus continues to meet the definition of an endangered species under the Act is supported by: the lack of knowledge about long-term population trends and recruitment rates; the continued current and potential threats, including those associated with cattle, energy and mineral development, recreation, and removal by collectors; the projected impacts of climate change; and the small known population size. Impacts from recreation to San Rafael cactus have increased since that evaluation and are likely to continue to do so (Service 2024).

Therefore, we conclude that Winkler cactus remain a Threatened species and San Rafael cactus remain an Endangered species that this time. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our Biological Status Report for Winkler cactus (*Pediocactus winkleri*) and San Rafael cactus (*Pediocactus despainii*) remains an accurate reflection of the species' current status.

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CURRENT CLASSIFICATION:

RECOMMENDATION RESULTING FROM THE 5-YEAR STATUS REVIEW:

____ 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

APPROPRIATE LISTING/RECLASSIFICATION PRIORITY NUMBER, IF APPLICABLE:
No change recommended to either species at this time.

RECOMMENDATIONS FOR FUTURE ACTIONS:
Update and finalize Recovery Plan for both species.

Lead Field Office Approval:

Signature: GEORGE WEEKLEY Digitally signed by GEORGE WEEKLEY Date: 2024.08.26 11:41:40 -06'00' Date: _____

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