

for this competitive bidding exemption, based on a determination of what rates and speeds are commercially available prior to the start of the funding year.

(2) A Tribal applicant that seeks support for category one or category two services for a total pre-discount price of \$3,600 or less per school or library annually is exempt from the competitive bidding requirements in paragraphs (a) through (c) of this section.

■ 5. Amend § 54.505 by revising paragraph (c) and adding paragraph (g) to read as follows:

§ 54.505 Discounts.

* * * * *

(c) *Matrices.* Except as provided in paragraphs (d), (f), and (g) of this section, the Administrator shall use the following matrices to set discount rates to be applied to eligible category one and category two services purchased by eligible schools, school districts, libraries, or consortia based on the institution’s level of poverty and location in an “urban” or “rural” area.

* * * * *

(g) *Tribal Category Two Discount Level.* For the costs of category two services, Tribal schools and libraries at the highest discount level shall receive a 90 percent discount.

■ 6. Amend § 54.703 by revising paragraphs (b), (b)(12), and (13), and by adding new paragraph (b)(14) to read as follows:

§ 54.703 The Administrator’s Board of Directors.

* * * * *

(b) Board composition. The independent subsidiary’s Board of Directors shall consist of twenty (20) directors:

* * * * *

(12) One director shall represent state consumer advocates;

(13) One director shall represent Tribal communities; and

(14) The Chief Executive Officer of the Administrator.

* * * * *

■ 7. Amend § 54.705 by revising paragraphs (a)(2)(iv) and (v) and adding new paragraph (a)(2)(vi) to read as follows:

§ 54.705 Committees of the Administrator’s Board of Directors.

(a) * * *

(2) * * *

(iv) One Tribal community representative;

(v) One at-large representative elected by the Administrator’s Board of Directors; and

(vi) The Administrator’s Chief Executive Office

* * * * *

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R8-ES-2022-0165; FF09E21000 FXES1111090FEDR 234]

Endangered and Threatened Wildlife and Plants; Petition Finding for Joshua Trees (*Yucca brevifolia* and *Y. jaegeriana*)

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notification of finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list Joshua trees (*Yucca brevifolia* and *Y. jaegeriana*) as endangered or threatened species under the Endangered Species Act of 1973, as amended (Act). After a thorough review of the best available scientific and commercial information, we find that listing Joshua trees as endangered or threatened species is not warranted. However, we ask the public to submit to us any new information that becomes available concerning the threats to the Joshua trees or their habitat at any time.

DATES: The finding in this document was made on March 9, 2023.

ADDRESSES: This finding is available on the internet at <https://www.regulations.gov> under Docket No. FWS-R8-ES-2022-0165. Supporting information that we developed for this finding, including the species assessment form, species status assessment report, and peer review, are available at <https://www.regulations.gov> under Docket No. FWS-R8-ES-2022-0165 and on the Service’s website at <https://www.fws.gov/office/carlsbad-fish-and-wildlife/library>. Supporting information is also available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Carlsbad Ecological Services Field Office, 2177 Salk Avenue, Suite 250, Carlsbad, CA 92008. Please submit any new information, materials, comments, or questions concerning this finding to the person listed under FOR FURTHER INFORMATION CONTACT.

FOR FURTHER INFORMATION CONTACT: Scott Sobiech, Field Supervisor, U.S.

Fish and Wildlife Service, Carlsbad Ecological Services Field Office, 2177 Salk Avenue, Suite 250, Carlsbad, CA 92008; telephone 760-431-9440.

Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Previous Federal Actions

On September 29, 2015, we received a petition from Taylor Jones (representing WildEarth Guardians), requesting that *Yucca brevifolia*—either as a full species (*Y. brevifolia*) or as two subspecies (*Y. b. brevifolia* and *Y. b. jaegeriana*)—be listed as threatened and, if applicable, critical habitat be designated. On September 14, 2016, we published a 90-day finding in the **Federal Register** (81 FR 63160) concluding that the petition presented substantial information indicating that listing the Joshua tree may be warranted. On August 15, 2019, we published a 12-month finding (84 FR 41694) concluding that listing either *Y. brevifolia* or *Y. jaegeriana* was not warranted. On November 4, 2019, WildEarth Guardians filed a complaint in the Central District of California challenging the analyses and listing decisions. The court vacated and remanded the listing decisions back to the Service (*WildEarth Guardians v. Haaland*, 2021 WL 4263831 (C.D. Cal. September 20, 2021)), ordering us to reconsider whether the two species of Joshua tree should be listed under the Act.

The Service has reassessed its August 2019 12-month finding and revised the species status assessment (SSA) report. This document complies with the September 20, 2021, court-ordered remand of the August 2019 “not warranted” 12-month findings for the two species of Joshua tree (*Yucca brevifolia* and *Y. jaegeriana*) and constitutes our new 12-month findings on the September 29, 2015, petition to list the Joshua tree species under the Act.

Supporting Documents

A species status assessment (SSA) team prepared an SSA report for Joshua trees (*Yucca brevifolia* and *Y. jaegeriana*). The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report and the information

reviewed represents compilations of the best scientific and commercial data available for the species, including the impacts of past, present, and projected future factors (both negative and beneficial) affecting the species, that we used to make our determination of status for the species.

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we sought the expert opinions of nine appropriate specialists regarding the SSA report for the Joshua trees. We received responses from five peer reviewers. We also coordinated with the California Department of Fish and Wildlife, Nevada Department of Wildlife, Arizona Department of Agriculture's Environmental Services Division, and the Utah State Department of Natural Resources and Natural Heritage Program during the development of the SSA report for the Joshua trees.

Background

Species Information

In this discussion, we present an overview of the biological information for Joshua trees (*Yucca brevifolia* and *Y. jaegeriana*). For the purposes of this analysis, we discuss both species together using the common name—Joshua tree(s)—when the discussion of information pertains to both species. Literature or conclusions specific to a single species are indicated by the species' scientific name, where applicable.

Species Description

Joshua trees are long-lived plants that occur in desert regions of the southwestern United States including portions of California, Arizona, Nevada, and Utah, well beyond the Joshua Tree National Park in California. Joshua trees are found throughout the Mojave, Great Basin, and Sonoran Deserts. Joshua trees have generally been addressed in the literature as a single species; however, recent references have identified at least two varieties or subspecies (*Yucca brevifolia* var. *brevifolia* and *Y. b.* var. *jaegeriana*). We consider the two entities to be two distinct species, the western Joshua tree (*Yucca brevifolia*) and eastern Joshua tree (*Y. jaegeriana*) based on expert analysis, and we treat them as two separate, listable entities. The SSA report has additional detailed descriptive information on Joshua trees (*Y. brevifolia* and *Y. jaegeriana*) (Service 2023, entire).

Yucca brevifolia—*Yucca brevifolia* is a 16–40 feet (ft) (5–12 meters (m)) tall, evergreen, tree-like monocot. The leaves are between 7.5 and 14.6 inches (in) (19–37 centimeters (cm)) long and are clustered in rosettes at the branch ends. Branching only occurs following flowering events where one or more lateral shoots develop from the base of the inflorescence (cluster of flowers) (McKelvey 1938, p. 130; Simpson 1975, p. 32). The flowers on the inflorescence are nearly spherical with short, wide petals that curve over the tip of the pistil and occur in dense, heavy panicles. *Tegeticula synthetica*, a species of yucca moth, pollinates the flowers; and the resulting seed pods require mechanical action (e.g., a rodent) to open and for the seeds to be dispersed. In addition to sexual reproduction, the species can also reproduce asexually through basal resprouts, particularly when under stress. *Yucca brevifolia* is long-lived (100 to several hundred years old), with a generation time of 50 to 70 years.

Yucca jaegeriana—*Yucca jaegeriana* is a shorter (9–20 ft; 3–6 m), evergreen, tree-like monocot. *Yucca jaegeriana* has shorter leaves (less than 8.7 in (22 cm)) and shorter height to first branching at 2.3–3.3 ft (0.75–1.0 m) than *Y. brevifolia*, which results in a denser canopy (see figure 3–1 in the SSA report; McKelvey 1938, p. 138; Service 2023, p. 9). The flower is elongate with narrow petals that wrap around the pistil forming a corolla tube. *Tegeticula antithetica*, a species of yucca moth, pollinates the flowers. The variation in floral morphology, specifically style length, between *Y. brevifolia* and *Y. jaegeriana* is strongly correlated with the physical characteristics of its obligate moth pollinator due to coevolution with *Tegeticula antithetica* having a shorter ovipositor than the *Y. brevifolia* pollinator. *T. synthetica* (see figure 3–1 in the SSA report; Godsoe et al. 2009, p. 820; Yoder et al. 2013, p. 11; Service 2023, p. 9). The resulting seed pods require mechanical action (e.g., a rodent) to open and for the seeds to be dispersed. In addition to sexual reproduction, the species can also reproduce asexually through basal resprouts, particularly when under stress. *Yucca jaegeriana* is long-lived (100 to several hundred years old), with a generation time of 50 to 70 years.

Hybrids—Hybrids occur in a smaller geographic area compared to the rest of the range, toward Joshua trees' northern limit, where the distribution of both species overlap, and are not reliably identifiable from morphological characteristics alone (Smith 2022, pers. comm.). The hybrid zone was not

included in our assessment of viability for *Yucca brevifolia* and *Y. jaegeriana*, although that zone confers additional resiliency, redundancy, and representation to both species.

Taxonomy

Yucca brevifolia var. *jaegeriana* was determined to be a distinct species based on morphological and pollinator differences (Lenz 2007, p. 100) and restriction-site-associated DNA (RAD)-sequencing (Royer et al. 2016, p. 1730). These analyses concluded that *Y. b.* var. *jaegeriana* should be raised to specific rank (Lenz 2007, p. 97) and that it is genetically distinct from *Y. b.* var. *brevifolia* (Royer et al. 2016, p. 1736). Additionally, *Y. brevifolia* diverged at least 5 million years ago, possibly due to geographic separation by the Bouse Embayment (a Pliocene Era chain of lakes) (Smith et al. 2008a, p. 2682). As described above, the two taxa, and their obligate moth pollinators, come into contact and plant hybridization occurs in the Tikaboo Valley, Nevada, (Starr et al. 2013, p. 4; Royer et al. 2016, p. 136).

Based on these analyses (Lenz 2007, entire; Smith et al. 2008b, entire; Royer et al. 2016, entire), and correspondence between the Service and editors of the Jepson Manual (Wallace 2017, p. 2), we consider *Yucca brevifolia* var. *brevifolia* and *Y. b.* var. *jaegeriana* to be two distinct species, and we treat them as two separate listable entities: *Y. brevifolia* and *Y. jaegeriana*, respectively. For additional information on Joshua tree taxonomy, see section 3.2 of the SSA report (Service 2023, p. 9).

Habitat/Life History

Joshua trees occur in desert regions of the southwestern United States and are located on alluvial fans, plains, and bajadas throughout the Mojave, Great Basin, and Sonoran Deserts. Joshua trees occur throughout a wide range of vegetation communities between approximately 1,279 and 8,775 ft (390 and 2,675 m) elevation. Joshua trees are often the tallest plants on the landscape where they occur but are not typically dominant in terms of vegetation cover. Joshua trees are a slow-growing desert plant. Because they do not have growth rings, accurately determining the age of Joshua trees is difficult. The height of a Joshua tree divided by an estimate of growth per year is used to estimate age. Joshua trees can live for several hundred years, though a more common lifespan is about 150 years, and have a generation time of 50 to 70 years. They can reproduce via several mechanisms, have unique habitat and ecological needs, and can disperse through environmental and biological means.

Joshua trees' life cycle includes seedling, established individual, juvenile, and adult stages (see figure 3–2 in the SSA report (Service 2023, p. 11)).

The life history of both *Yucca brevifolia* and *Y. jaegeriana* relies on a complex set of interactions between individual plants, yucca moths, seed dispersers, herbivores/predators, and abiotic conditions for successful reproduction and survival to a reproductively mature adult (see figure 3–2 in the SSA report (Service 2023, p. 11)). Joshua trees reproduce sexually through pollination and seed production as well as asexually through vegetative growth (clones). The relative contribution of sexual and asexual reproduction and whether the proportion varies regionally is not known. The clonal growth strategy likely increases persistence of individuals and populations when under stress. Optimal reproduction and recruitment of Joshua trees requires a convergence of events, including fertilization by its obligate pollinators (Pellmyr and Segraves 2003, p. 721), seed dispersal and caching by rodents (Vander Wall et al. 2006, p. 543; Waitman et al. 2012, p. 5), seedling emergence from a short-lived seed bank triggered by isolated late-summer rainfall (Reynolds et al. 2012, p. 1652), and exposure to cold temperatures that improve seedling and juvenile growth and survival (Went 1957, p. 173). For additional information, see the SSA report's section 3.4 (Service 2023, p. 10).

Historical and Current Range/ Distribution

Historical Distribution—Joshua trees have occurred in southwestern deserts for at least 6 million years (Smith et al. 2008a, p. 255), persisting through several geologic time periods characterized by variable climate conditions (temperature and precipitation patterns). Joshua trees' historical distributions are based on a 2022 empirical study conducted throughout the range of *Yucca brevifolia* and *Y. jaegeriana* and we estimate 9,642,136 acres (ac) (3,903,699 hectares (ha)) were occupied historically (see figure 4–1 in the SSA report; Esque 2022b, pers. comm.). All areas where adult Joshua trees were recorded are considered part of the historical range over an approximate time period of 1900 to 1950, based on the lifespan of Joshua trees and development trends in the region. Presence, absence, and status (alive, dead, or ornamental) of adult Joshua trees were assessed through aerial interpretation and ground truthing of aerial imagery within quarter square kilometer (500 m by 500 m) grid cells. This method could not be applied in the northern portion of the species' range near Nellis Air Force Base in southern Nevada. Therefore, for the species' range near Nellis Air Force Base, we rely on the distribution from the 2018 Joshua tree SSA (Service 2018, p. 11), which provides the best available data for Joshua tree distribution in this area.

Current Distribution—The current range of Joshua trees extends from northwestern Arizona to southwestern Utah west to southern Nevada and southeastern California (see figure 4–1 in the SSA report (Service 2023, p. 31)). Joshua trees are currently distributed over several large discontinuous areas totaling 9,447,883 ac (3,825,054 ha) of a much larger region. The refined distribution presented in the SSA report is based on a 2022 USGS empirical study conducted throughout the range of *Yucca brevifolia* and *Y. jaegeriana* (Esque 2022b, pers. comm.; Service 2023, pp. 30–31). Very little of the historical range has been lost; the current distribution of Joshua trees is reduced by approximately 3 percent compared to the historical distribution. The current distribution is less acreage than we reported in the previous 2019 SSA report (12,144,840 ac; 4,906,749 ha). The previous distribution was based on the records and reports available at that time (Service 2019, p. 14). Although our updated current distribution is less than previously reported, it is not based on a loss of habitat; rather it is an updated estimate of current distribution of the species based on new, more accurate, information. Please see sections 4.1 and 4.2 of the SSA report for further information on Joshua trees' historical and current distributions (Service 2023, pp. 30–31).

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Joshua Tree *Yucca brevifolia* and *Yucca jaegeriana* California, Nevada, Utah, Arizona

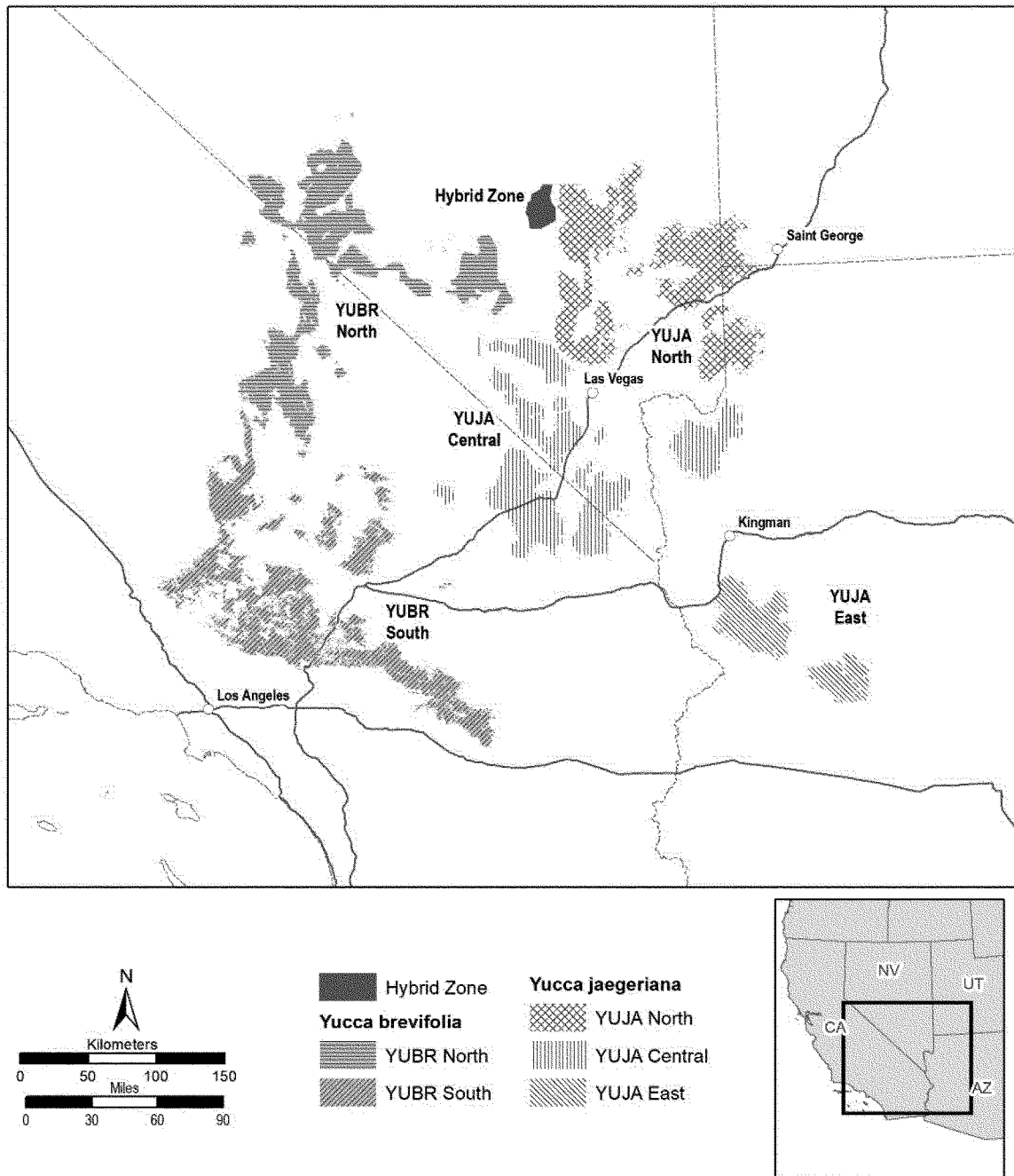


Figure 1. Joshua tree distribution including analysis units occupied by *Yucca brevifolia* and *Y. jaegeriana*.

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Species Ecological Needs

A species' biological condition should be evaluated relative to the three

conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306-311). Briefly, resiliency describes the ability of the species to

withstand environmental and demographic stochasticity; redundancy describes the ability of the species to withstand catastrophic events; and representation describes the ability of

the species to adapt over time to long-term changes in the environment. In general, the more redundant, representative, and resilient a species is, the more likely it is to sustain populations over time, even under changing environmental conditions. Below we describe the population- and species-level needs for Joshua trees that were used to evaluate resiliency. These concepts will be discussed in more detail in the Analytical Framework section below.

Population Needs

Joshua trees require that habitat and demographic needs are met for population resiliency. Joshua trees rely on habitat elements that include appropriate substrate, appropriate climatic conditions, yucca moth pollinators, rodent seed-caches, nurse plants, and dispersal. Appropriate climatic conditions include adequate amounts of annual precipitation (4.7–16.9 in (11.8–42.9 cm)), summer monthly precipitation in excess of 1.1 in (2.9 cm) in the months of July and August, average summer temperatures based on the range experienced historically (67 to 91 degrees Fahrenheit

(°F); 19.4 to 32.8 degrees Celsius (°C)), and winter temperatures between 29 and 50 °F (–1.7 and 10 °C). To reproduce successfully, Joshua trees need yucca moth pollinators, nurse plants, and seed-caching rodents. The demographic needs that Joshua trees require are survival, abundance, recruitment, and dispersal. Sufficient growth and survival at all life stages is required for an individual to reach sexual maturity and to maintain an abundant population. A diverse age structure is important for withstanding variability in climate and the pressures of threats such as drought, herbivory, and wildfire because young age-classes are more susceptible to mortality during these events than adults.

Joshua trees require populations of sufficient abundance to be maintained over time with stable or increasing population growth. Sufficient abundance is achieved through survival of young age classes to adult, successful reproduction, and recruitment to support the next generation. There must be adequate survival at all life stages to support an abundant adult population. We currently lack a population viability analysis and information on the

abundance at each age class required to maintain resiliency. Sufficient recruitment is necessary to maintain the population over the long term. In particular, seed set needs to be high enough to ensure future recruitment considering seed predation and the low percentage of viable seed that germinate and survive to reproduce. Dispersal of propagules is important for gene flow to maintain appropriate levels of genetic variability. Dispersal also allows for potential recolonization of sites following disturbance. See chapter 5 of the SSA report for further information on population needs (Service 2023, pp. 41–50).

The 2023 SSA report analyzes resiliency within six analysis units including two populations of *Yucca brevifolia* (YUBR North and YUBR South), three populations of *Y. jaegeriana* (YUJA North, YUJA East, and YUJA Central), and a hybrid zone (described further in section 4.5 of the SSA report (Service 2023, pp. 36–40)). With the exception of the hybrid zone, we use these five analysis units to analyze both current conditions and future conditions in this document and the SSA report (Figure 1, Table 1).

TABLE 1—SUMMARY OF ANALYSIS UNITS USED IN THE SSA REPORT

[This table appears in the SSA report as table 4–3; Service 2023, p. 37]

Population	Occupied habitat ac (ha)	Elevation range ft (m)	Land ownership (%)*
YUBR North	2,129,113 (861,989)	2,475–8,775 (754–2675)	Federal: 97.6, State: 0.51, Private: 1.6.
YUBR South	2,288,162 (926,381)	1,922–7,640 (586–2,328)	Federal: 52.3, State: 2.1, Private: 45.6.
YUJA North	2,065,476 (836,225)	1,540–7,961 (469–2,426)	Federal: 98, State: 0.9, Private: 1.1.
YUJA Central	2,089,163 (845,815)	1,626–7,627 (495–2,325)	Federal: 91, State: 1.9, Private: 7.9.
YUJA East	754,821 (305,595)	1,279–5,067 (390–1,544)	Federal: 59.8, State: 16.7, Private: 23.5.

* Local ownership was less than 1 percent for all analysis units.

Species Needs

Species needs are an exploration of what influences redundancy and representation for Joshua trees. This requires an examination of the Joshua trees’ evolutionary history and historical distribution to understand how Joshua trees function across their range. To maintain redundancy, numerous local Joshua tree populations need to be distributed widely across the landscape with some degree of connectivity to withstand catastrophic events. Finally, to maintain representation, which is needed by the species to respond to changing environmental conditions, genetic diversity must be maintained by preserving populations that are morphologically, geographically, or ecologically diverse. In general, Joshua

trees need multiple, large, sufficiently resilient populations distributed across the range of ecological variability to have the redundancy and representation to withstand catastrophic events and adapt to environmental change given the trees’ moderate adaptive capacity. See chapter 5 of the SSA report for further information on population needs (Service 2023, pp. 41–50).

Regulatory and Analytical Framework

Under section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq.*), we are required to make a finding whether or not a petitioned action is warranted within 12 months after receiving any petition for which we have determined contains substantial scientific or commercial information indicating that the

petitioned action may be warranted (“12-month finding”). We must make a finding that the petitioned action is: (1) Not warranted; (2) warranted; or (3) warranted but precluded by pending proposals to determine whether any species is an endangered species or a threatened species, and expeditious progress is being made to add qualified species to the Lists of Endangered and Threatened Wildlife and Plants. We must publish a notice of these 12-month findings in the **Federal Register**.

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations set forth the procedures for determining whether a species is an