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IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA

WILDEARTH GUARDIANS, Plaintiff, vs. UNITED STATES FISH AND WILDLIFE SERVICE and DEB HAALAND, in her official capacity as U.S. Secretary of the Interior, Defendants.	Case No.: 2:24-cv-02281 **COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF** (Endangered Species Act, 16 U.S.C. § 1531 *et seq*.)

INTRODUCTION

1. Joshua trees are long-lived, prehistoric succulents that have become a highly-revered symbol of the Southern California desert. Their namesake, Joshua Tree National Park, is among the nation's top ten most visited national parks with millions of people annually coming to hike, camp, and climb against the backdrop of these iconic plants. Joshua trees have a beloved place in pop culture history as well, ranging from their feature on the cover of artist U2's album of the same name to serving as reliable extras in multiple films, television shows, and music videos over the past 50 years.

Figure 1. Joshua Tree as featured on U2's 1987 album cover. Photograph by Joho345 - @U2, distributed under a Creative Commons Attribution 2.5 Generic license.

2. This is the second time this Court has been asked to determine the legality of a decision by the United States Fish and Wildlife Service (the "Service") regarding whether to list both species of Joshua tree (*Yucca brevifolia* and *Y. jaegeriana*) as threatened

under the Endangered Species Act ("ESA"). This Court held that the Service's previous decision in 2019 not to list the Joshua tree as threatened was arbitrary and capricious, and therefore unlawful. *WildEarth Guardians v. Haaland*, 561 F. Supp. 3d 890 (C.D. Cal. 2021) (Wright, J.) ("*WildEarth Guardians I*").

3. While adult trees are still broadly distributed across the Mojave Desert, *every* peer-reviewed, published study to model the impact of climate change on Joshua trees predicts that the species will be rendered functionally extinct across the vast majority of their current range by century's end. Increasing temperatures and prolonged droughts are expected to prevent Joshua trees from successfully reproducing and/or surviving the especially vulnerable early life stages. In other words, currently existing mature trees that established themselves on the landscape before human-caused climate change began substantially altering the environment will die off, and there will be no new generations of the species to replace them outside of small pockets of "climate refugia."

4. According to these recent projections, under the business-as-usual greenhouse gas (GHG) emissions scenario only 0.02 to 10% of currently occupied habitat will remain suitable enough to meet the Joshua tree's biological needs beyond the 21st century. Worse, these small pockets of climate refugia at higher elevations are at increased risk of high-severity fires that result in widespread Joshua tree mortality and decimate desert ecosystems for decades, if not centuries, depending on drought conditions.

Figure 2. Joshua trees burn in the Cima Dome fire. Once a dense Joshua tree woodland in the Mojave National Preserve–a cooler, higher elevation area modeled as climate refugia–now resembles a graveyard for the species after the massive Dome fire in 2020 consumed roughly 43,000 acres and destroyed an estimated 1.3 million Joshua trees. Photo: James Quigg for the Victorville Daily Press.

5. The Environmental Protection Agency (EPA) predicts that between 20 to 25% of existing Joshua tree habitat will also be lost to urban development and large-scale energy projects. Though most of this habitat loss from development is forecasted to occur within areas that are projected to be climatically unsuitable for Joshua trees by century's end anyway, in the absence of federal ESA protections for the species, some of it is slated to occur within modeled refugia—further reducing the miniscule amount of suitable habitat projected to remain.

6. Rather than fully acknowledge these compounding and synergistic threats in its 2023 remanded listing decision, the Service irrationally determined for a second time that neither species of Joshua tree warrants listing. 88 Fed. Reg. 14536 (March 9, 2023) ("12-Month Finding"). In reaching this conclusion, the Service repeated many of the same mistakes that led this Court to overturn the agency's 2019 "not warranted" listing determination. *See WildEarth Guardians I*, 561 F. Supp. 3d 890-905.

7. Though the case for listing Joshua trees has only grown stronger in the past few years, the Service has once again unreasonably disregarded the best available science and otherwise acted in an arbitrary and capricious manner. WildEarth Guardians is thus compelled to bring this second civil action requesting the Court vacate the 2023 listing decision and remand it to the agency for a third attempt at reaching a decision that fully complies with the ESA.

JURISDICTION AND VENUE

8. This action is brought pursuant to the Endangered Species Act, 16 U.S.C. § 1540(g)(1)(C), which waives the Defendants' sovereign immunity. This Court has jurisdiction over this action by virtue of 28 U.S.C. § 1331 (federal question jurisdiction), 28 U.S.C. § 2201 (declaratory judgment), 16 U.S.C. § 1540(c) (actions arising under the ESA), and 16 U.S.C. § 1540(g) (citizen suit provision of the ESA).

9. This Court has the authority to review the Service's action(s) complained of herein and grant the relief requested, under the ESA's citizen suit provision, 16 U.S.C. §

1540(g), and the APA, 5 U.S.C. § 706, and may issue a declaratory judgment and further relief pursuant to 28 U.S.C. §§ 2201-02.

10. Venue is proper in this Court under 16 U.S.C. § 1540(g)(3)(A) and 28 U.S.C. § 1391(e).

11. Plaintiff has exhausted all available administrative remedies. All requirements for judicial review required by the ESA are satisfied. WildEarth Guardians mailed a sixty-day notice of intent to sue letter to the Service on August 3, 2023. This letter notified the Service of Plaintiff's intent to file a civil action to rectify the legal violations described in the letter. More than sixty days have elapsed since the Service received WildEarth Guardians' notice of intent to sue letter for violating the ESA.

12. Plaintiff has organizational standing. WildEarth Guardians satisfies the minimum requirements for Article III standing because its members, supporters, and staff have suffered and continue to suffer injuries to their interests in Joshua trees and Joshua tree conservation from the Service's 2023 not warranted listing decision. This Court can redress these injuries by granting the relief requested. There is a present and actual controversy between the Parties.

PARTIES

13. Plaintiff, WILDEARTH GUARDIANS ("Guardians") is a non-profit, 501(c)(3) conservation organization based in Santa Fe, New Mexico. Guardians' mission is to protect and restore the wildlife, wild places, wild rivers, and health of the American

West. It has over 261,000 active members and supporters nationwide with a substantial number of members in Joshua tree habitat in the Southwestern United States. Guardians has an active endangered species protection campaign, with a geographic focus on flora and fauna endemic to the western United States. As part of this campaign, Guardians has repeatedly urged the Secretary to list imperiled species, including the Joshua tree, as threatened or endangered species pursuant to the ESA. Guardians first filed its petition to list the Joshua tree in September 2015. Guardians invested substantial organizational resources in preparing this petition and in submitting timely comments to the Service in response to the agency's September 2016 positive 90-day finding for the Joshua tree. After filing its initial petition in 2015, Guardians' staff continued to devote significant time toward working to conserve the Joshua tree, including by filing suit in 2019 over the Service's first "not warranted" listing decision and also by submitting revised petitions in 2021 to list the species on an "emergency" basis in light of new information and circumstances while the litigation was still pending.

14. Guardians brings this action on behalf of itself and its adversely affected members. Guardians and its members derive scientific, aesthetic, recreational, and spiritual benefit from imperiled species and their habitats. Guardians and its members frequently use and enjoy, and will continue to use and enjoy, the Joshua tree and the ecosystems on which it depends for its survival. Guardians and its members have observed and photographed Joshua trees, made multiple visits to Joshua Tree National

Park and Mojave National Preserve, and have ongoing interests in the Joshua tree and its habitat. Guardians and its members have future plans to visit and observe the Joshua tree and, in particular, to return to Joshua Tree National Park and the Mojave National Preserve. Guardians' and its members' interest in observing, studying, and otherwise enjoying the Joshua tree is being, and, unless the relief requested in this complaint is granted, will continue to be irreparably harmed by the Service's arbitrary and capricious refusal to protect the Joshua tree under the ESA.

15. The legal violations alleged in this complaint cause direct injury to the aesthetic, conservation, recreational, inspirational, educational, and botanical preservation interests of Guardians and its members. These are actual, concrete injuries to Guardians, caused by the Service's failure to comply with the ESA and its implementing regulations and policies. These injuries would be redressed by the relief requested in this complaint. Guardians has no other adequate remedy at law.

16. Defendant U.S. FISH AND WILDLIFE SERVICE is an agency of the federal government located within the U.S. Department of the Interior. The Secretary of the Interior has charged the Service with implementing and enforcing the ESA. 50 C.F.R. § 402.01(b). The Service is responsible for administering the ESA with respect to the Joshua tree, including species listing determinations under ESA Section 4.

17. Defendant DEB HAALAND is the Secretary of the U.S. Department of the Interior, and has the ultimate responsibility for implementation of the ESA. She is sued in her official capacity.

LEGAL FRAMEWORK

Endangered Species Act

18. In enacting the ESA, Congress recognized that endangered and threatened species are of "esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people." 16 U.S.C. § 1531(a)(3). Accordingly, the ESA seeks "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species." *Id*. § 1531(b).

19. To accomplish these goals, Section 4 of the ESA requires the Secretary of the Interior, acting through the Service, to list species determined to be "endangered" or "threatened." *Id*. § 1533(a).

20. The ESA defines an "endangered species" as "any species which is in danger of extinction throughout all or a significant portion of its range." *Id*. § 1532(6). The ESA defines a "threatened species" as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." *Id*. § 1532(20).

21. The ESA broadly defines a "species" to include "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." 16 U.S.C. § 1532(16).

22. The ESA does not define "foreseeable future." In 2009, the Department of the Interior's Office of the Solicitor issued an opinion regarding the meaning of "foreseeable future." The opinion directs the Service to interpret "foreseeable future" in accordance with its ordinary meaning. The opinion also directs the Service to adopt a threat-specific approach that analyzes the "foreseeable future" based on the best scientific data available for each threat. The "foreseeable future" extends only so far as those predictions are reliable. The M-Opinion states that "'[r]eliable' does not mean 'certain'; it means sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the [ESA]." U.S. Dep't of the Interior, Office of the Solicitor, Memorandum on the Meaning of "Foreseeable Future" in Section 3(2) of the Endangered Species Act, No. M-37021, at 13 (Jan. 16, 2009).

23. In August, 2019, the Service promulgated new regulations defining the term "foreseeable future." 50 C.F.R. § 424.11(d). Under this definition, the Service interprets the "foreseeable future" to "extend[] only so far into the future as the Services can reasonably determine that both the future threats and the species' responses to those threats are likely." 50 C.F.R. § 424.11(d). The Service determines "the foreseeable future on a case-by-case basis, using the best available data and taking into account

considerations such as the species' life-history characteristics, threat-projection timeframes, and environmental variability." *Id.*

24. The ESA directs the Service to "determine whether any species is an endangered species or a threatened species because of any of the following factors:"

> (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
> (B) overutilization for commercial, recreational, scientific, or educational purposes;
> (C) disease or predation;
> (D) the inadequacy of existing regulatory mechanisms; or
> (E) other natural or manmade factors affecting its continued existence.

16 U.S.C. § 1533(a)(1). The ESA requires the Service to list a species if the best scientific and commercial data available show "that the species meets the definition of an endangered species or threatened species because of any one or a combination of the [five listing] factors." 50 C.F.R. § 424.11(c).

25. The Service must make its listing determinations "solely on the basis of the best scientific and commercial data available." 16 U.S.C. § 1533(b)(l)(A), (c)(2); 50 C.F.R. § 424.11(b), (d). Under this standard, the Service cannot ignore evidence solely on the ground that it lacks complete scientific certainty. Even if the best available scientific and commercial data are quite inconclusive, the Service must still rely on it.

26. Further, in making listing determinations, the Service may not conflate the

question of whether a species is threatened or endangered "throughout a significant portion of its range" with the question of whether it is threatened or endangered throughout its entire range.

27. To ensure the timely protection of species at risk of extinction, Congress set forth a detailed process whereby citizens may petition the Secretary to list a species as threatened or endangered. 16 U.S.C. § 1533(b)(3)(A); 50 C.F.R. § 424.14(a). This process includes mandatory deadlines for the Service to respond to petitions and make final listing determinations. *Id*. § 1533(b)(3), (5), (6); 50 C.F.R. § 424.14(h)(1), (2).

28. Once a species is listed under the ESA, an array of critical statutory protections applies to ensure the continued existence of the species as well as provide for its recovery to the point where its protection under the Act is no longer necessary. For example, Section 7 of the ESA requires all federal agencies to take affirmative steps to ensure that there is no risk that any of their actions might "jeopardize the continued existence . . .or result in the destruction or adverse modification of habitat" of any listed species. 16 U.S.C. § 1536(a)(2). To this end, Section 7 requires federal agencies to consult with the Service when their actions may affect a listed species. *Id*.; 50 C.F.R. § 402.14(a). The purpose of this consultation is to identify reasonable and prudent alternatives that will avoid the action's unfavorable impacts. Additionally, the Service may "suggest modifications" to an action during consultation to "avoid the likelihood of

adverse effects" to the listed species even when the action would not by itself jeopardize the species' continued existence. 50 C.F.R. § 402.13(b).

29. Additionally, Section 4(a)(3) requires the Service to designate "critical habitat" for listed species, which are the areas that must be protected to ensure the species survival and recovery. 16 U.S.C. § 1533(a)(3). Finally, Section 4(f) mandates that the Service develop and implement recovery plans for listed species, a roadmap of how the species can eventually be secure from the risk of extinction and removed from the list of threatened and endangered species. *Id*. § 1533(f).

Administrative Procedure Act

30. While the ESA provides for judicial review of a "not warranted" 12-month finding, *id*. § 1540(g), the APA generally governs the standard and scope of judicial review. 5 U.S.C. §§ 701–706.

31. Under the APA, a reviewing court "shall hold unlawful and set aside agency action, findings, and conclusions found to be . . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Id*. § 706(2)(A).

32. An agency's action is arbitrary and capricious if the agency has relied on factors that Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a

difference in view or the product of agency expertise. *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

BACKGROUND

The Joshua Tree

33. Joshua trees (*Yucca brevifolia*, *Yucca jaegeriana*) are large members of the Agave family that occur almost exclusively in the Mojave Desert but with portions of a few populations extending into the Great Basin Desert to the north and the Sonoran Desert to the east.

34. Joshua trees are culturally significant to many Indigenous Peoples of the Mojave and western Sonoran Desert. Ancestors of the Cahuilla people routinely used several parts of the Joshua tree as food and fiber. Tough leaves were worked into baskets and sandals, and flower buds and raw or roasted seeds made a healthy addition to the diet. Today, Joshua trees are not only an enduring symbol of sacred lands for local indigenous communities, but remain culturally important because many other Mojave Desert species depend on Joshua trees for some part of their life cycles – from insects, to small mammals, and birds.

35. Long considered a single species with two subspecies or varieties, the Service recently determined that Joshua trees – *Yucca brevifolia* and *Yucca jaegeriana* – are two distinct species and thus two separate listable entities under the ESA. *See* 84 Fed. Reg. 41,696 (Aug. 15, 2019). Aside from a small hybrid zone in Tikaboo Valley, Nevada

where the two species grow alongside one another, each lives in different areas, are genetically and morphologically distinguishable, and have different obligate pollinator moths.

Figure 3. *Yucca brevifolia* (left) and *Y. jaegeriana* (right) growing side by side in Tikaboo Valley, Nevada (Photo by Christopher I. Smith). Image from U.S. Fish and Wildlife Service, 2023 Species Status Assessment ("SSA").

36. The western Joshua tree (*Yucca brevifolia*) lives primarily in California, extending into Nevada east of Death Valley National Park with the southern extent of its range in Joshua Tree National Park's little San Bernardino Mountains. The eastern Joshua tree (*Yucca jaegeriana*) lives in southeastern California in the Mojave National

Preserve, as well as in southern Nevada, and small portions of northwestern Arizona and southwestern Utah.

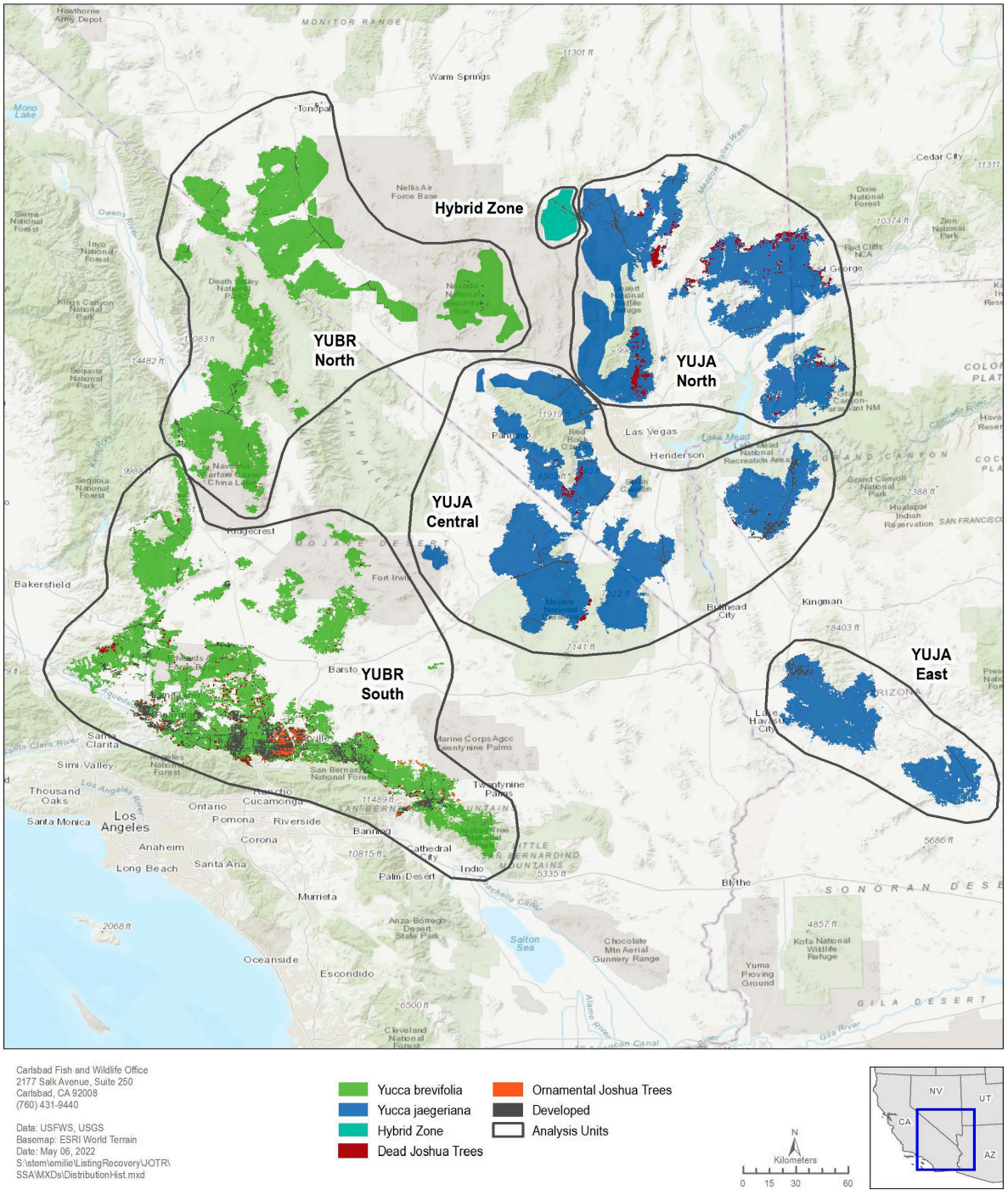

Figure 4. Historical distribution of Joshua trees (Esque 2022b, pers. comm.) Picture from 2023 SSA.

37. The western Joshua tree is the larger of the two and can grow up to 70 feet tall, although trees over 40 feet are rare. Trunks are fibrous and the one- to two-inch-thick bark is soft and corklike. The lowest branches are usually six to ten feet above the ground with leaves between 7 to 15 inches long. Branching occurs only following the first flowering. Once they flower, Joshua trees depend upon one tiny insect for pollination—a species of yucca moth. Western Joshua tree flowers are solely pollinated by *Tegeticula synthetica*.

38. The shorter, eastern Joshua tree typically ranges between 9 to 20 feet tall and has shorter leaves (less than 9 inches) and shorter height to first branching (between 2 and 4 feet), resulting in a denser canopy than the western Joshua tree. The flower is also pollinated by a different species of yucca moth, *Tegeticula antithetica*. The variation in floral morphology between the two species of Joshua trees is strongly correlated with the different physical characteristics of their obligate pollinator moths due to coevolution.

39. Joshua trees are characterized by infrequent germination, slow growth rates (growing just 1 to 2 inches annually), long lifespans that may be up to several hundred years but more commonly about 150 years, and long generation time (50 to 70 years). It can take 30 to 70 years before an individual tree matures and flowers. Though each species of Joshua tree depends on a single species of yucca moth to reproduce sexually, Joshua trees sometimes reproduce asexually by rhizome growth.

40. Joshua trees, similar to almost all yuccas, have an obligate pollination mutualism with yucca moths. Female moths carry pollen to Joshua tree flowers in specialized mouthparts, inject eggs into the floral ovaries using a bladelike ovipositor, and then actively apply pollen to the stigmatic surface to fertilize the flower. As a Joshua tree flower develops into a fruit, the moth eggs hatch and the emerging larvae eat a portion of the developing seeds. The moths are the sole pollinators of Joshua trees, and in turn, the Joshua tree seeds are the only food source for the moths.

41. Just as a portion of a Joshua tree's seed production goes to its pollinator, a large percentage of its seed production goes to its primary dispersers, various scatter-hoarding rodents, which are known to climb Joshua trees to remove the fruits for later consumption and/or to eat through the desiccated fruits in situ to reach the seeds. Once fruits are on the ground, numerous other species will dismantle the fruits and eat and/or cache the seeds.

42. Seeds cached by rodents are more likely to germinate than seeds left at the soil surface. However, the germination rate of cached seeds is still very low. Overall, seed dispersal of Joshua trees is generally considered quite limited, constraining the ability of the species to shift or extend their range in response to changing climatic conditions.

43. Studies have shown that seedlings are also more likely to emerge under shrub cover, demonstrating the importance of "nurse plants" that can provide favorable microclimates for successful Joshua tree germination and protection from herbivory.

44. Once a seedling emerges, it faces a long, arduous path to adulthood, with high mortality rates until it exceeds 25 cm in height (approximately 10 inches). Survival of seedlings requires periods of cool temperatures, little to no herbivory, summer rain, and some amount of yearly precipitation over a period of several years.

45. Studies indicate that warm season maximum temperatures and cold season minimum temperatures limit the distribution of Joshua trees. Although they can survive high temperatures, drought decreases survivorship and recruitment. Joshua trees already do not occur in the lowest, driest portions of the Mojave. Conversely, extreme cold events also limit the distribution of Joshua trees, but they need a period of cold (minimum winter temperature of approximately 4°C (39°F)) to maximize growth. Scientists postulate that these limiting factors likely explain why the species is restricted to the Mojave's slightly cooler, mid-elevation zone.

46. Successful recruitment of Joshua trees thus requires a rare convergence of events including: fertilization by their unique pollinators; seed dispersal and caching by rodents; seedling emergence from a transient seed bank triggered by isolated late-summer rainfall; nurse plants; and an appropriate temperature range. Alignment of these

convergent events likely results in the successful establishment of new seedlings only a few times in a century.

47. Joshua trees' long lifespan, limited reproductive events, long generation time, and extended age of sexual maturity limit their ability to adapt to more rapid changes in their environment. The species' adaptive capacity and the extent that its populations can persist in the face of changing environmental conditions is also constrained by their obligate mutualism with the yucca moth. Research on the ability of the yucca moth to adapt to changing environmental conditions, e.g., keep pace with climate change, is presently limited.

Threats to the Joshua Tree's Continued Persistence

48. The primary threats affecting the Joshua tree's ability to successfully recruit new generations and survive as a species are climate change (e.g., increasing temperatures and prolonged drought), more frequent and severe wildfires largely fueled by the proliferation of invasive grasses, habitat loss and degradation, and herbivory. These factors are often related and synergistic, and – in combination with the species' naturally low germination rates, slow growth and extremely limited dispersal capability – collectively threaten the Joshua tree's future persistence.

49. According to California's Inlands Deserts Region Report that was prepared as part of its Fourth Climate Change Assessment (Hopkins, 2018), daily average high temperatures in the Mojave ecoregion are projected to increase by 8-14ºF by the end of

the century. The report also describes how rainfall rates are currently low (approximately 5 inches per year) and highly variable from year to year and that this variability is projected to increase over the coming decades, with extreme drought and extreme wet events both becoming more common. As the report further explains, increasing frequencies of these extreme events will in turn increase the risk of flash flooding and wildfire, given the close relationship between precipitation variability and growth of invasive grasses that serve as the major fuel for wildfire in the region.

Climate Change

50. While the delicate balance allowing Joshua trees to survive is being disrupted by several human-caused threats, climate change is chief among them. Since the early 2000s, several studies have projected the impacts of climate change on Joshua trees by modeling the relationship between the species' current distribution and the climate parameters that appear to constrain that distribution—i.e., the climatic conditions that experts believe are necessary for the Joshua tree to meet its biological needs at all life stages.[1] Typically referenced as "species distribution models," "ecological niche models," or "bioclimatic models," these studies use statistical models, the species' baseline geographical distribution data, and climate parameters to develop a climate model that provides a good fit for the species' current distribution (e.g., a species' "climate envelope" or "climate niche"). These models are then applied to a future period under a

[1] E.g., Shafer et al. 2001; Dole et al. 2003; Cole et al. 2011; Barrows and Murphy-Mariscal 2012; Thomas et al. 2012; Comer et al. 2013b; Sweet et al. 2019.

range of climate scenarios based on likely GHG emissions scenarios, such as the Representative Concentration Pathways (RCPs) adopted by the Intergovernmental Panel on Climate Change (IPCC), to identify habitat areas projected to be climatically favorable in the future where all the species needs are projected to be met based on having the same climate conditions as the species' current distribution. The peer-reviewed, published models listed in footnote 2 represent the best available science on how climate change is expected to affect the future distribution of Joshua trees.

51. *Every* bioclimatic model available for Joshua trees published to date has reached the same conclusion: the vast majority of the species' range will be rendered climatically unsuitable by century's end. That is, increasing temperatures, decreased precipitation, or a general increase in drought stress will preclude Joshua trees from having the climatic conditions necessary to successfully reproduce and/or reach adulthood throughout the range where they presently occur. Outside small, scattered pockets of "climate refugia," mature trees that were able to establish on the landscape during more favorable climatic conditions will die off and new generations of young Joshua trees will be unable to replace them.

52. Several recent studies provide evidence that increasing temperatures and prolonged droughts over the last half-century are already precluding successful recruitment of new, young Joshua trees in portions of their southern range. E.g., Barrows et al. (2012); Sweet et al. 2019; Cornett (2019), (2022); Graver (2022).

53. The bioclimatic models all found that even under optimistic, reduced-emission or "low emission" climate scenarios like RCP 4.5 and a projected 2 to 3ºC increase in summer temperatures (3.6 to 5.4ºF), approximately 60 to 98% of the Joshua tree's range will become climatically unsuitable between the next three to seven decades. Under a high emission scenario, like RCP 8.5 and a projected 5ºC increase in summer temperature (9°F), which experts like Sweet et. al. 2019 refer to as the "business-as-usual" scenario, there will be almost a complete loss of Joshua trees from their present range, e.g., 90 to 99.8% of their current habitat will be rendered climatically unsuitable by the end of the century timeframe (2070-2099).

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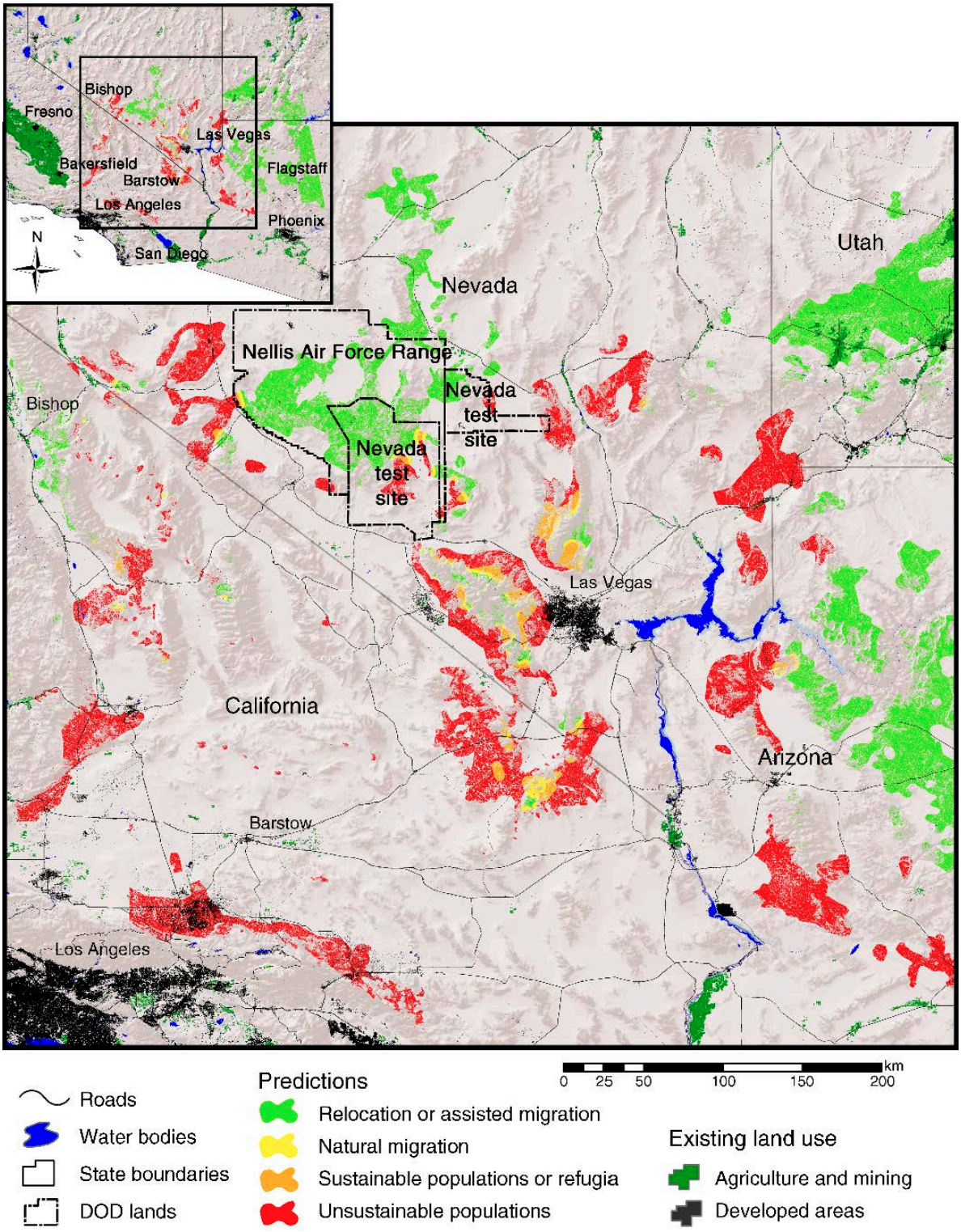

Figure 5. Areas where a majority of models predict Joshua tree climates will become "unsuitable" for survival (red) and potential suitable relocation (green) under a low to medium emissions scenario for the period 2070-2099. Cole et al. 2011.

54. Although some of these models show the potential for climate change to shift conditions favorable for Joshua trees into new areas outside their current range, studies show that the Joshua tree is extremely limited in its ability to disperse beyond an average of 6.5 feet/year and thus will be unable to colonize such areas on their own. *See e.g.*, areas depicted in green on the image from Cole 2011 above.

55. Further, the modeled climate refugia within the Joshua tree's current range, such as small microclimates on north facing slopes and higher elevations, are at great risk of fire due to the prevalence of highly flammable invasive grasses. According to recent studies, large percentages of areas that are modeled as climate refugia have already burned, including approximately half of the refugia identified within Joshua Tree National Park and thousands of acres of refugium within the Mojave National Preserve.

More frequent, severe fire

56. Mojave ecosystems are not fire adapted. Historically, wildfires in the region were small and exceptionally rare, with fire return intervals greater than 300 and 500 years. But several recent studies confirm that fire has significantly increased in both frequency and severity over the past few decades, with climatic changes and the proliferation of invasive grasses. Current conditions form a feedback loop, wherein increased fire frequency and extent further promotes the invasion of annual grasses into previously uninvaded areas, with increased annual grass cover and abundance in turn leading to more extensive and severe wildfires.

57. According to a 2013 Rapid Ecoregional Assessment for the Mojave Basin and Range that was prepared by the U.S. Bureau of Land Management (BLM), invasive annual grass species and wildfire are the most significant threats to the Mojave ecosystem. This Assessment found that even "trace" amounts of grass cover can carry fire across open spaces between shrubs, affecting vast amounts of the Mojave's mid-elevation shrublands where Joshua tree predominantly occur.

58. Recent studies further confirm that these higher intensity fires have resulted in significant, widespread mortality of Joshua trees. For instance, DeFalco et al. (2010) found that five years after a fire in Joshua Tree National Park, 80% of burned Joshua trees in the study area had died, with smaller trees (<1m tall) dying more rapidly. This study also found that 26% of unburned trees in the study area died during the same period (1999-2004), with drought and increased herbivory likely contributing factors. The high mortality recorded in this study is consistent with high mortality documented in other studies and what experts have recently observed with large, high-severity fires in the Mojave National Preserve. For instance, in 2020, the 43,000-acre Dome fire killed an estimated 1.3 million eastern Joshua trees (*Yucca jaegeriana*) in the heart of the Mojave National Preserve and then in July 2023 the 93,000-acre York fire caused similar devastation in the eastern portion of the Preserve, burning nearly one million more eastern Joshua trees according to National Park Service (NPS) officials. These large fires occurred in areas of modeled climate refugia.

59. Fires also tend to track the same heavy precipitation winters that are most suitable for Joshua tree seedling emergence as invasive annual grasses tend to benefit from extreme precipitation events, which in turn further exacerbates threats to young Joshua trees and their ability to reach adulthood. Other indirect effects to Joshua trees from fire might include a degraded seed bank, loss of aboveground vegetation that could serve as nurse plants to seedlings, and alteration in seed-caching rodent dynamics within Joshua tree stands.

60. Desert ecosystems recover very slowly from post-fire degraded conditions, which may take longer than 80 to 100 years in areas that experienced high-severity burns. These areas will not be able to support the recruitment of new Joshua trees during this long recovery period.

Habitat Loss and Degradation

61. Joshua trees are also threatened by habitat loss and degradation from other human activities. While much Joshua tree habitat is within federally managed lands, many of those areas where management is most protective (e.g. National Parks) are where the impacts of climate change and wildfire may be most severe. Other areas of federal land that are home to the species are subject to poorly-regulated activities including off-road vehicle use, cattle grazing, power and pipeline rights-of-way and large-scale energy projects that consume or degrade habitat. Further, over half of the

western Joshua tree's southern population is within private land, with little protection from development.

Petition and Listing History

62. In September 2015, Guardians filed a petition requesting the Service list the Joshua tree as "threatened" under the ESA. In response, the Service issued a positive 90-day finding, concluding that Guardians' petition presented substantial scientific and commercial information indicating that listing the Joshua tree as threatened may be warranted. 81 Fed. Reg. 63,160–165 (Sept. 14, 2016). This positive 90-day finding then triggered the Service's duty to complete a full scientific review of the species' status and reach a final 12-month finding. 16 U.S.C. § 1533(b)(3)(B).

63. Under internal policy created without public notice and comment, the Service uses a "Species Status Assessment" ("SSA") to inform the agency's listing decision.

64. Although the ESA requires that the 12-Month Finding "shall" be completed within 12 months of a petition, 16 U.S.C. § 1533(b)(3)(B), the Service published the Joshua tree SSA nearly two years later, in July 2018 and issued the final 12-Month Finding nearly three years later, in August 2019, 84 Fed. Reg. 41,694-01 (Aug. 15, 2019).

65. In its cursory 2019 "not warranted" 12-Month finding, the Service justified its decision to deny listing Joshua trees as threatened due to the species' long lifespan,

large ranges and distributions, and alleged ability to occupy numerous ecological settings. 84 Fed. Reg. at 41,697.

Guardians' First Lawsuit Over the Service's Failure to Protect Joshua Trees

66. Guardians challenged the Service's 2019 negative finding, arguing that the agency had arbitrarily: 1) concluded that Joshua trees are not threatened by climate change in light of the best available science, 2) dismissed and downplayed threats from more frequent and severe fires, 3) concluded the cumulative effects of climate change, wildfires, habitat loss and degradation, along with the species' naturally low germination rates and limited dispersal capacity did not threaten Joshua trees, 4) concluded that *Y. brevifolia* is not threatened throughout any significant portion of its range given the aforementioned cumulative and synergistic threats facing the species in its southern range, and 5) failed to assess whether the lack of existing regulatory mechanisms for addressing climate change threaten Joshua trees. *WildEarth Guardians I*, Case No. 2:19-cv-09473-ODW-KS (Complaint) (ECF No. 1) (filed Nov. 4, 2019).

67. On September 20, 2021, the Court agreed with Guardians on all counts, holding that the Service had acted arbitrarily and in violation of the ESA by: (1) disregarding or otherwise cherry-picking the findings of the available species distribution models in concluding that climate change did not threaten Joshua trees throughout significant portions of their ranges, (e.g., on the one hand disregarding the substantial loss of habitat projected by all five climate models while pointing to portions of those same

studies showing that climate change is also projected to create new areas of suitable habitat northward at higher elevations); (2) ignoring evidence showing Joshua trees' limited dispersal capacity will prevent the species from migrating to areas that are outside its current range that are predicted to have future suitable climates; (3) concluding wildfires did not pose a significant threat to Joshua trees when the best available science shows that this is a substantial threat throughout the Mojave; (4) concluding that a 41.6% loss of *Y. brevifolia's* habitat from development was insignificant because it was not a complete loss; (5) failing to rationally explain whether the forecasted climate change driven loss of 90 to 99.8% of *Y. brevifolia's* habitat constituted a significant portion of the species' range; and (6) failing to account for the inadequacy of existing regulatory mechanisms pertaining to climate change. The court vacated the Service's 2019 "not warranted" listing finding and remanded the matter back to the Service for reconsideration consistent with its opinion and order. *WildEarth Guardians I*, 561 F. Supp. 3d 890-906.

68. The Court then approved the parties' stipulated agreement requiring the Service to issue a new 12-Month Finding for the two species of Joshua tree no later than January 31, 2023, which was later amended to March 2, 2023.

The Challenged 2023 Not Warranted Finding

69. Following *WildEarth Guardians I,* the Service prepared a revised SSA report that was intended to determine whether the best available science supports a

finding that either or both species of Joshua tree meets the ESA's definition of a threatened or endangered species. On March 9, 2023 the Service issued the new 12-month finding—a finding that again concluded neither species of Joshua tree warrants federal protections as threatened species. 88 Fed. Reg. 14,536 (March 9, 2023).

70. The 2023 SSA, like the 2018 SSA, again identified and discussed the following as primary threats to both species of Joshua tree: (1) changing climatic trends, (e.g., increased temperatures and longer more frequent drought periods); (2) increased risk of wildfire and invasive annual grasses; (3) habitat loss and degradation (largely from urbanization and renewable energy development), and (4) seed predation and herbivory. The 2023 SSA acknowledges that these factors are often related and synergistic and collectively threaten the Joshua tree's future viability.

71. The 2023 SSA acknowledges that all the available "bioclimatic models" agree "that much of the range of both species will be climatically unfavorable and unlikely to support suitable climatic conditions due to increased temperatures, decreased precipitation, or a general increase in drought stress" by the end of the century timeframe (2070-2099).

72. The 2023 SSA acknowledges that these bioclimatic models represent "the best available information on how climate change may affect Joshua trees' distribution in the future."

73. The 2023 SSA acknowledges that experts have already observed declines in population size, tree vigor, and recruitment within the southern range of *Yucca brevifolia*. For example, at Joshua Tree National Park, mortality is outpacing recruitment with 2.2 dead trees for every Joshua tree seedling (Graver 2022, p. 1). Experts also documented a 4.9 percent population decline and a 9 percent decline in adult trees over an approximate 12-year period within Joshua Tree National Park. Similarly, at Red Rock Canyon State Park, they recorded a 46 percent decline over a 21-year period, including declines in both juvenile and adult trees (Cornett 2019, p. 108).

74. As for future conditions, the Service developed two scenarios (Scenario I and Scenario II) to assess the plausible range of threats (habitat loss, invasive grasses, wildfire, drought and increased temperatures associated with climate change) and their potential impacts on the two Joshua tree species and their habitat between the end of the century timeframe (2070–2099). According to the 2023 SSA, these "two future scenarios provide a spectrum of the best available information regarding potential habitat loss and degradation, existing regulatory mechanisms, and beneficial conservation measures expected to occur during this period [i.e., a timeframe of 80 years, until the end of the century (2070 to 2099)."

75. Future conditions under Scenario I are based on a continuation of current threats under an approximate 5.4°F (3°C) increase (RCP 4.5) in average temperature. Future conditions under Scenario II are based on an increase in threats under an

approximate 9°F (5°C) increase (RCP 8.5) in average temperature. The 2023 SSA explains that all the data the Service considered were based on RCP GHG concentration scenarios adopted by the IPCC with the exception of invasive grass cover. The Service selected both RCP 4.5 and RCP 8.5 because they provide a plausible range of future conditions considering the potential for both near-term mitigation (RCP 4.5) and continued increases in GHG emissions (RCP 8.5) throughout the 21st century.

76. The 2023 SSA recognizes increased temperatures and prolonged drought from climate change as the highest magnitude threats to Joshua trees under both Scenarios I and II, resulting in the potential loss of occupied habitat, range contractions, and habitat degradation across 66 to 99 percent of the current distribution, depending on the scenario, with the greatest impacts at lower elevations and latitudes.

77. Under the Service's low emissions scenario approximating RCP 4.5, Scenario I, 66 to 80 percent of Joshua trees' distribution is projected to be climatically unfavorable at the end of the century, and 20 to 44 percent of the range is anticipated to provide climatically favorable conditions in climate refugia where all the species needs (e.g., sufficient pollinators, survival, and appropriate recruitment conditions to maintain population abundance) are projected to be met.

78. Under the Service's high emissions scenario approximating RCP 8.5, Scenario II, approximately 90 to 99 percent is projected to be climatically unfavorable at

the end of the century, with 1 to 10 percent of the distribution potentially providing climate refugia.

79. The 2023 SSA acknowledges that projected climate refugia correspond with middle and high elevation vegetation communities that are also estimated to have increased risk of high severity wildfires. The Service projects that wildfires will result in substantial tree mortality, decreased tree densities, and limited recruitment of new Joshua trees as the habitat recovers, which could take 80 to 100 years or more depending on drought conditions. Areas at lower elevation, particularly to the northeast, are forecasted to have higher frequency wildfires in areas expected to be substantially degraded by climate change.

80. Under Scenarios I and II, respectively, the Service forecasts that approximately 12 to 18 percent of the remaining modeled refugia habitat will be lost or degraded by wildfire by the end of the century; this range assumes a 50 to 100 percent increase in the proportion of Joshua tree habitat that has burned in the last 60 years (currently around 9 percent).

81. The Service predicts that habitat may recover following single, low to moderate severity, low frequency wildfires, though recovery may be hampered by increased drought. However, Joshua tree habitat is unlikely to recover from multiple wildfires or a single high severity wildfire before the end of the century. Therefore,

modeled refugia may not be functional refugia if these areas experience increased frequency or severity of wildfire and can no longer support the species.

82. The 2023 SSA projected future habitat loss from development based on land use estimates from the Integrated Climate and Land Use Scenarios (ICLUS) database for RCP 4.5 and 8.5 (EPA, 2015). Habitat loss from urban development is a concentrated threat to *Yucca brevifolia's* southern population where over 45% occurs on private lands. According to the 2023 SSA, over 2 million acres of *Yucca brevifolia's* total habitat is projected to be lost from urban development and large-scale renewable energy projects. Though most of this habitat loss from development is forecasted to occur within areas that are projected to be climatically unsuitable for Joshua trees by century's end anyway, the Service expects some additional loss of modeled climate refugia.

83. The Service considers herbivory and predation of Joshua trees currently low magnitude threats that are exacerbated by extended drought conditions, but these threats are projected to increase under future climate change scenarios. The southern portion of *Y. brevifolia's* range will also be most adversely affected by drought-exacerbated herbivory and predation.

84. Despite these dire findings, the Service nonetheless concluded that listing either species of Joshua tree as threatened under the ESA was "not warranted." In reaching this finding, the Service relied on the two species still currently "occupying" most of their historical ranges. The Service's reliance on "occupancy" is based on the

broad distribution of mature Joshua trees, most of which established during pre-industrial climate conditions. The Service also reasoned that Joshua trees do not meet the ESA's definition of threatened species because already established adult trees can "persist" in degraded, climatically unsuitable habitat, e.g., they will not immediately die off. The Service recognizes that individual Joshua trees may persist in the future in areas where they are functionally extirpated because all or a portion of the species needs are no longer met. Projected temperature increases and prolonged drought conditions over the next 80 years may not immediately kill off adult Joshua trees, but the best available science shows these climatic changes will preclude successful recruitment of new Joshua trees throughout most of both species' ranges by 2070-2099. The Service understands that these projections from the best available science indicate Joshua trees will become functionally extinct in 66 to 99% of their range between 2070 to 2099.

85. Peer-reviewers of the 2023 SSA expressed concern over the Service's reliance on "occupancy" of already established mature Joshua trees to reach its listing decision. For instance, a state agency scientist for the State of California directed the Service to review the California Department of Fish and Wildlife's 2022 status assessment for the western Joshua tree (*Yucca brevifolia*), which was prepared in response to a petition to list the species under the state's Endangered Species Act ("CESA"). According to this peer-reviewer's comments, the state agency's 2022 listing assessment provides: "There may be a time delay between the time when an area

becomes no longer suitable for a species (crossing an extinction threshold) and when that species is no longer present, (Tilman et al. 1994, Kuussaari et al. 2009, van Mantgem et al. 2009, Svenning and Sandel 2013, Figueiredo et al. 2019). Extinction processes often occur with a time delay and populations living close to their extinction threshold might survive for long periods of time despite local extinction being inevitable (Hanski and Ovaskainen 2002, Lindborg and Eriksson 2004, Helm et al. 2006, Vellend et al. 2006, Malanson 2008, Cronk 2016). Because western Joshua tree is a long-lived species, adults could persist for decades or longer in areas that are no longer suitable for recruitment, or recruitment may continue, but at rates that are ultimately insufficient to maintain the species. Although these areas may be occupied, the presence of western Joshua tree may merely represent a delayed local extinction."

86. Peer-reviewers of the Service's 2018 SSA had expressed similar concerns when the Service arbitrarily disregarded the forecasted loss of climatically suitable habitat from the available bioclimatic models. For instance, peer-reviewer Dr. Smith identified "two significant, interrelated problems" with the Service's assumptions regarding the Joshua tree's future persistence based on the species' current widespread distribution. In his peer review comments on the 2018 SSA, Dr. Smith wrote:

> First, the current distribution of Joshua tree includes individuals who are hundreds of years old, and that became established during pre-industrial climate conditions when global average temperatures were a full degree cooler than they are today, and about 0.75 degrees cooler than the 30-year average. Indeed, it is well established that long-lived trees can persist as relict stands of moribund adults that

> exist outside the range of suitable habitats required for long term population persistence (citation omitted).
>
> In the case of Joshua trees in particular, we have very compelling evidence that the current distribution of mature trees does not reflect the climate requirements for successful germination and seedling establishment. For example, extensive mapping studies in Joshua Tree National Park found that seedlings occur only in a fraction of the area occupied by adults, and that this area corresponds to the predicted distribution under a 2-degree warming scenario [Barrows et al., 2012]. That is, the suitable habitat for seedlings is much smaller, includes a narrower range of climates, than would be predicted based [on] adult presence data. Although the Barrows [et al. 2012] study considered only a small portion of the geographic range of Joshua trees, other workers have found similar patterns across the Joshua trees range.

87. In the 2023 listing decision, the Service defined the "foreseeable future" timeframe as 2040-2069, only 17-47 years from the present. 88 Fed. Reg. at 14,542. This timeframe is not the foreseeable future. The best available information for all primary threats to Joshua trees (climate change, wildfire, and habitat loss from development) goes out until 2100.

88. The Service said it used 17-47 years to define the foreseeable future for its listing decision because "although there are climate projections available that project climatically favorable and unfavorable areas through the end of century, climate change is the only threat where we have reliable information for that time period." 88 Fed. Reg. at 14,542. The best available science shows climate change is the greatest threat to the Joshua trees' ability to successfully reproduce and reach a mature reproductive stage and thus persist as a species beyond 2070-2099. The Service recognizes that the available bioclimatic models are reliable information for the end of century period (2070-2099) and

are the best available information for predicting how climate change will affect the species' distribution within this timeframe. The available bioclimatic models have no more uncertainty for the 2070-2099 timeframe as they do for the 2040-2069 timeframe.

89. The Service's 2023 SSA, like its 2018 SSA, also used Scenarios I and II to project the extent and magnitude of threats for all primary threats to Joshua trees (habitat loss, invasive grasses, wildfire, drought and increased temperatures associated with climate change) out until the end of century (2070–2099). The Service said these two future scenarios provide a spectrum of the best available information for assessing all primary threats to Joshua trees with a timeframe of 80 years, until the end of the century (2070 to 2099). The Service based Scenarios I and II on the IPCC's RCP 4.5 and RCP 8.5 because they provide a plausible range of future conditions considering the potential for both near-term mitigation (RCP 4.5) and continued increases in GHG emissions (RCP 8.5). These two scenarios were developed to address the uncertainty over human decisions that affect GHG emissions throughout the 21st century in order to reliably forecast end of century climate conditions.

90. The Service justified its final listing decision by stating that human decisions that affect GHG emissions beyond 50 years are a "major source of uncertainty." Yet the best available science on the Joshua trees' future distribution during the end of century timeframe (2070-2099) is based on the most likely GHG emissions trajectories for the remainder of the 21st century. Each underlying RCP scenario, 4.5 and 8.5, represent a

distinct possible future during the end of century timeframe (2070-2099). Therefore, the Service's Scenario I and II each represent a distinct possible future during the end of century timeframe (2070-2099). Under both scenarios, Joshua trees will be functionally extinct, i.e., unable to meet all their biological needs, throughout significant portions of their range (across 66 to 99 percent of the current distribution, depending on the scenario) by century's end due to climate change. The Service's projections for the extent and magnitude of threats to Joshua trees for the earlier time period (2040–2069) that it used to define the foreseeable future also relied on the same assumptions the Service made for its end of century projections under Scenarios I and II. However, the Service determined that Joshua trees should not be listed as threatened because "the timing and magnitude of the species' responses" to the conditions forecasted in the best available science from climate change and wildfire are still too uncertain.

FIRST CAUSE OF ACTION

(Violation of the ESA – Arbitrary and capricious finding that Joshua trees are not threatened based on the five factor threat factors)

91. Plaintiff hereby incorporates all preceding paragraphs.

92. In evaluating whether a species qualifies for listing as a threatened or endangered species, the Service must determine whether a species is threatened by the following factors: (A) the present or threatened destruction, modification, or curtailment of the species' range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory

mechanisms; and (E) other man-made factors affecting the species' continued existence. 16 U.S.C. §§ 1532(20), 1533(a)(1); 50 C.F.R. § 424.11(c). These factors are listed in the disjunctive so any one or combination of them can be sufficient for a finding that a species qualifies as threatened or endangered. The statute further required that, in doing this, the Service must utilize the "best scientific and commercial data available." 16 U.S.C. § 1533(b)(1)(A).

93. The Service reached a multitude of arbitrary findings that fall within the ESA's listing factors (A), (D), and (E). 16 U.S.C. § 1533(a)(1); 50 C.F.R. § 424.11(c). The Service arbitrarily concluded that both species of Joshua tree do not warrant listing as threatened under either factor (A) ("the present or threatened destruction, modification, or curtailment of its habitat or range"), or factor (E) ("other natural or manmade factors"), due to the substantial projected loss of suitable habitat from climate change, or from the combined and cumulative threats of climate change, wildfire, and development, because some adult trees will still "occupy" this unsuitable habitat at century's end. The Service failed to apply the best available science in reaching this finding because "occupancy" does not demonstrate the species' future viability—adult trees will be dying off and unable to replace themselves in this unsuitable habitat, i.e. functionally extinct. Likewise, the Service failed to articulate a rational connection between the facts found and the choice ultimately made by the agency. Overall, the Service improperly dismissed,

misinterpreted and misapplied the best available science on threats from climate change, fire, habitat loss and degradation and cumulative threats.

94. The Service also failed to sufficiently analyze the inadequacy of existing regulatory mechanisms to address the primary threats to Joshua tree, particularly climate change (factor D). Simply stating that the Clean Air Act and California's climate policies will help to reduce GHG emissions in the U.S., *see* 88 Fed. Reg. at 14,544, falls short of demonstrating that existing regulatory mechanisms are robust enough to actually mitigate the threat climate change poses to Joshua trees such that listing the species as threatened is not warranted under this factor. Here, the best available science, including the IPCC's most recent reports, reveal that existing regulatory mechanisms such as the Clean Air Act and California's climate policies are indeed inadequate to address the threats to Joshua tree from climate change. *See Wildearth Guardians I*, 561 F. Supp. 3d at 905 (the Service cannot simply base its determination that existing regulatory mechanisms are adequate on its determination that threats to Joshua tree do not warrant its listing).

95. For these and additional reasons, the Service's not warranted finding is contrary to the best available science, dismisses threats that warrant protection, violates the ESA, and is arbitrary and capricious, an abuse of discretion, and otherwise not in accordance with law. 16 U.S.C. § 1533; 5 U.S.C. § 706(2)(A).

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SECOND CAUSE OF ACTION

(Violation of the ESA – Arbitrary and capricious finding that Joshua trees are not threatened throughout a significant portion of their range)

96. Plaintiff hereby incorporates all preceding paragraphs.

97. In making its "not warranted" determination, the Service failed to carefully consider and adequately evaluate whether either species of Joshua tree is at risk of becoming endangered within the foreseeable future throughout a "significant portion of its range." 16 U.S.C. § 1532(20).

98. As it did in its 2019 listing decision, the Service again failed to rationally explain why the forecasted loss of 66 to 99.8% of the Joshua tree's current range by century's end, under either Scenario I and II, respectively, does not constitute a "significant portion of the [species'] range." *See Wildearth Guardians I*, 561 F. Supp. 3d at 904. Nor did the Service rationally explain why a projected loss of 66 to 88.6 percent of *Yucca brevifolia's* range due to climate change between the shortened timeframe of 2040-2069 that it used to define the foreseeable future does not constitute a "significant portion" of the species' range.

99. The Service did not evaluate and consider, in the first instance, whether certain portions of the Joshua tree's range are "significant."

100. The Service irrationally claimed that Joshua trees are not threatened in any significant portion of their range because the species does not have a "different status" in the lower elevations of its range than the rest of its range. 88 Fed. Reg. at 14,558, 14,559.

Here, the Service seems to be unlawfully interpreting the "significant portion of its range" clause. Whether the projected loss of a portion of the species' range is significant enough to warrant listing, be it a 66.8%, 88.6% or 99.8% habitat loss, the Service must rationally explain whether that loss constitutes a "significant portion of the range." Once again, the Service failed to do so.

101. The best available science also demonstrates that threats to *Yucca brevifolia* are concentrated in its southern range. According to the 2023 SSA, YUBR South is currently comprised of 2,288,162 acres of occupied habitat. Under Scenario II, a projected total of 879,656 acres of this "analysis unit" will be lost to urban development by century's end (representing a greater than 50% change over current conditions). The SSA also states that most large-scale energy projects are slated for this analysis unit, with up to 260,000 additional acres of *Yucca brevifolia's* total range projected to be developed for renewable energy projects. Further, at least 9% (195,108 acres) of YUBR South has already been destroyed or degraded as Joshua tree habitat from fires occurring since 1960. These burned areas are quickly recolonized by invasive grasses and are at high risk of reburning. As such, the Service predicts that up to 18% of the projected climate refugia (only 20,000 remaining acres are expected to meet the species' biological requirements) may burn in high severity fires that result in high Joshua tree mortality. The Service failed to provide a rational explanation for why a nearly complete loss of YUBR South constitutes an insignificant portion of the species' range.

102. For these and additional reasons, the Service's not warranted finding is contrary to the best available science, arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the ESA. 5 U.S.C. § 706 (2)(A).

THIRD CAUSE OF ACTION

(Violation of ESA – failure to use best available science and reaching conclusions contrary to the best available science)

103. Plaintiff hereby incorporates all preceding paragraphs.

104. Pursuant to Section 4(b)(1)(A), 16 U.S.C. § 1533(b)(1)(A), the Service's implementing regulations, and the Service's 2011 policy on scientific integrity, the Service must make all listing decisions "solely on the basis of the best available scientific and commercial data available." The Service failed to do so when again deciding not to list the Joshua tree.

105. For example, there is a massive disconnect from what the best available science predicts in terms of climate change impacts to Joshua trees and the Service's ultimate conclusion that climate change does not threaten the species ability to persist in the foreseeable future. The Service arbitrarily disregarded the findings of the best available science on threats from climate change, wildfire, and cumulative threats.

106. The Service insisted on more scientific certainty than the best available science can provide. "Definitive conclusions" or knowing precisely how and when a species will respond to specific threats is not required to list a species as threatened. The Service irrationally concluded that Joshua trees are not threatened from climate change

because it lacks information on the species' "physiological thresholds." The Service irrationally concluded that Joshua trees are not threatened from climate change because it is unable to predict precisely when already established adult trees will die off. The best available science shows climate change will prevent already established adult trees from replacing themselves by 2070-2099. Ample scientific data exists that establishes the Joshua tree's vulnerabilities at early life stages and its biological needs for successful recruitment. The best available science explains how increasing temperatures and prolonged drought conditions will preclude future generations of Joshua trees from establishing themselves on the landscape. The Service also recognizes that several recent studies have already observed decreases in population size, tree vigor, and recruitment in *Yucca brevifolia's* southern range from climatic changes, e.g., increasing temperatures and droughts, that have occurred over the last half-century. The best available information confirms: Joshua trees already do not occur in the hottest and driest portions of the Mojave at lower elevations; the Joshua trees' historical range contracted northward along the southern edge of its Pleistocene range as climates warmed at the start of the Holocene; since the middle of the Holocene period (approximately 8,000 years-before-present) Joshua trees have been largely restricted to the Mojave's mid-elevation zone; under either RCP 4.5 or RCP 8.5, over the coming decades climate change will transform the vast majority of the Mojave's mid-elevation zone into a largely barren landscape that resembles the lowest elevation areas now with only small pockets of "climate refugia"

that are at high-risk of being destroyed by invasive grass-fueled wildfires (much of which has also already been burned); and Joshua trees lack the dispersal capability to shift their range to cooler, higher elevations in time to avoid this forecasted loss of suitable habitat. The Service violated the ESA by insisting on more definitive information regarding the Joshua tree's precise tipping point when its own analyses are replete with references to numerous studies documenting the species' needs and the negative effects of increasing temperatures and prolonged drought conditions on those biological requirements.

107. The Service's conclusion that climate change does not independently, or cumulatively (when combined with other key stressors like wildfire and development), threaten the Joshua tree's ability to persist throughout all or a significant portion of its range in the foreseeable future is contrary to the best available science and thus arbitrary and capricious in violation of the ESA. 5 U.S.C. § 706 (2)(A).

FOURTH CAUSE OF ACTION

(Violation of ESA – The Service's listing decision arbitrarily defined the "foreseeable future")

108. Plaintiff hereby incorporates all preceding paragraphs.

109. Under the ESA, the Service must list a species as "threatened" if it "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20); 50 C.F.R. § 424.11(d)(2).

110. The term "foreseeable future" is not defined in the ESA. In a 2009 Solicitor Memorandum (M-Opinion 37021), the Service says what constitutes the "foreseeable

future" for a particular listing determination must be rooted in the best available data that allow predictions into the future. The "foreseeable future" extends only so far as those predictions are reliable. The M-Opinion states that reliable does not mean certain; it means sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the ESA. M-Opinion 37021 at 13.

111. The Service interprets "foreseeable future" to mean the period through which it can reliably determine the threats to a species and the likely consequences. M-Opinion 37021 at 13; *Ctr. for Biological Diversity v. Haaland*, 998 F. 3d 1061, 1063 (2021).

112. In deciding not to list Joshua trees, the Service utilized the new regulatory definition of "foreseeable future" in 40 C.F.R. § 424.11(d). The Service defined the "foreseeable future" as only 17-47 years from the present. Such determination is contrary to the best available science, contrary to the Service's own status assessments in which it analyzed all key threats (climate change, wildfire and development) through the end of the century (2070 – 2099), and contrary to law.

113. For Joshua trees, 17-47 years is not the foreseeable future. The best available science allows the Service to predict current and future threats to Joshua trees and Joshua tree habitat (including threats from climate change) to at least 2099. The 2023 SSA evaluates threats to the Joshua tree to 2099 and the SSA considers 2099 to be within the foreseeable future.

114. The Service also arbitrarily defined the foreseeable future timeframe as only 17-47 years from the present because Joshua trees have long lifespans and a single generation timeframe of 50 to 70 years. In deciding to list the whitebark pine as threatened – a similarly long-lived plant with long generation times – the Service recognized that in order to understand future extinction risk for such long-lived species with long generation times that it needs to examine the effects of stressors *at least* one generation into the future. 87 Fed. Reg. 76882, 76884, 76910 (Dec. 15, 2022) (Final Rule) (defining the foreseeable future timeframe for its whitebark pine listing determination as 40 to 80 years from the present because the full range of possible generation times for this tree is 40 to 80 years). As the Service further noted in its final listing rule for whitebark pine, "considering effects of stressors over at least one generation allows us to capture the effects of these stressors on reproduction (i.e., it allows us to discuss whether sufficient reproduction can occur in the future to replace trees lost to various stressors)." *Id*. In contrast, defining the foreseeable future timeframe as just 17-47 years for the Joshua tree does *not* encompass the full range of variation for the length of one generation for Joshua trees, which is 50 to 70 years. Defining the foreseeable future timeframe as just 17-47 years for the Joshua tree allowed the Service to exclude the most deleterious effects of climate change and other stressors on Joshua tree reproduction in reaching its listing determination, i.e., "whether sufficient reproduction can occur in the future to replace trees lost to various stressors."

115. The Service's decision not to list Joshua trees based on its definition of 17-47 years as the "foreseeable future" timeframe is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the ESA. 5 U.S.C. § 706(2)(A).

116. The new regulatory definition of "foreseeable future" in 50 C.F.R § 424.11(d), as applied to the Service's 2023 listing decision for Joshua trees is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the ESA. 5 U.S.C. § 706(2)(A.

REQUEST FOR RELIEF

THEREFORE, Guardians respectfully requests that the Court:

1. Declare that the Service acted arbitrarily and capriciously and violated the ESA in issuing the challenged 12-Month Finding;
2. Vacate and remand the 12-Month Finding for further analysis and agency action consistent with this Court's decision;
3. Award Guardians its reasonable fees, costs, and expenses, including attorneys' fees, associated with this litigation pursuant to section 11(g) of the ESA, 16 U.S.C § 1540(g) and/or the Equal Access to Justice Act ("EAJA"), 28 U.S.C.§ 2412; and
4. Grant Guardians such further and additional relief as the Court may deem just and proper.

Respectfully submitted this 20th day of March, 2024.

/s/ Jennifer Schwartz
Jennifer R. Schwartz, *application for PHV pending*
Lead Counsel for Plaintiff

/s/ *Jennifer Williams*
Jennifer L. Williams
Local Counsel for Plaintiff