



May 29, 2025

Erika Zavaleta
President
California Fish and Game Commission
715 P Street, 16th Floor
Sacramento, CA 95814

RE: CalCIMA Comments WJTCP June 2025 Commission Meeting

Dear President Zavaleta and Members of the Fish and Game Commission,

CalCIMA appreciates the opportunity to provide this consolidated feedback on the Draft Western Joshua Tree Conservation Plan (Plan). This letter references our four previous submissions, which collectively underscore the importance of preserving the iconic Western Joshua Tree while balancing California's economic and infrastructure development needs. The western Joshua Tree is a species that currently occupies 1.8 million acres of ecologically core and ecologically intact habitat, equal to 25% of the total developed acreage of humans in California and number between 3 and 9 million. The public deserves a carefully crafted policy to ensure we do not overtax critical minerals for renewable and other clean energy and essential infrastructure development while adapting to climate change.

Across our prior comments, we have highlighted critical concerns with the Plan's current form, including its incompleteness, the absence of clear, measurable conservation objectives, and the unrealistic scope of proposed land acquisitions—over 479,000 acres by 2033. We had hoped to update such figures through review of a complete plan, but such a plan has yet to be provided despite the fact comments on the plan closes today, May 29, 2025, just two weeks before the commission is slated to act.

We have not received confirmation that the amendments we submitted in our comments dated May 08, 2025, have been implemented. We further haven't seen to what extent our other concerns with the incomplete plan or concepts for improvement have or have not been implemented. While homeowners have appropriately been treated to a relocation exemption in the updated relocation guidelines published yesterday, the scientific justification for such has not been included for others to benefit from as well. Perhaps it is in the plan.

Our key recommendations, detailed in our earlier letters, urge the Commission and California Department of Fish and Wildlife (CDFW) to:

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- Define clear, measurable conservation targets aligned with the legislature's directive to maintain the species' status without requiring endangered listing.
- Ground land conservation goals in sound ecological and economic data, ensuring realistic, achievable outcomes.
- Leverage existing public lands and conservation frameworks to focus efforts efficiently.
- Provide transparent, detailed information on funding, staffing, and permitting processes necessary to support Plan implementation.

The Western Joshua Tree Conservation Act reflects a balanced legislative intent—to conserve this resilient species while allowing for responsible economic growth. It is imperative that the Conservation Plan reflects this balance through clarity, completeness, and practical implementation strategies. We encourage commissioners to review and incorporate into the plan the four amendments CalCIMA suggested if the Department did not, they.

1. Clarify the distinction between the Plan and the permitting process.
2. Address avoidance and minimization for previously entitled homes and infrastructure.
3. Introduce an avoidance and minimization framework for mineral development.
4. Introduce an avoidance and minimization Safe Harbor for relocated and preserved trees.

We respectfully urge the Commission to ensure the Plan is fully developed, financially and operationally supported, and transparent before final adoption. CalCIMA remains committed to constructive collaboration to achieve a conservation strategy that protects California's natural heritage and supports its communities. We have attached our May 08, 2025, letter for reference.

Thank you for your consideration.

Respectfully,



Adam Harper
Senior Director of Policy
California Construction and Industrial Materials Association



May 08, 2025

Erika Zavaleta
President
California Fish and Game Commission
715 P Street, 16th Floor
Sacramento, CA 95814

Charlton “Chuck” Bonham
Director,
California Department of Fish and Wildlife
715 P Street
Sacramento, CA 95814

RE: CalcIMA Suggested Amendments WJTCP May 2025

Dear President Zavaleta and Director Bonham,

CalcIMA appreciates the opportunity to continue providing input on the Draft Western Joshua Tree Conservation Plan (Plan) to the California Fish and Game Commission (Commission). Respecting the urgency of the Commission’s timeline, we have developed focused amendment proposals that offer immediate clarity while establishing a foundation for future iterations of the Plan.

It is critical that we work collaboratively to realize the dual objectives of the Plan and the Western Joshua Tree Conservation Act. This vision was aptly captured by Assemblymember Juan Carrillo during the Assembly Floor discussion of SB 122:

“This bill is not just about preservation of a remarkable species, it is a testament to the ability to strike a delicate balance between safeguarding our natural heritage and providing a pathway for the much needed economic development that our district yearns for.”

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Recognizing the time limitations and the breadth of unresolved questions, we respectfully submit four targeted amendments for your consideration:

1. Clarify the distinction between the Plan and the permitting process
2. Address avoidance and minimization for previously entitled homes and infrastructure
3. Introduce a avoidance and minimization framework for mineral development
4. Introduce a avoidance and minimization Safe Harbor for relocated and preserved trees

Amendment 1: Add Background on Permitting (Section 1.1.3)

The Department correctly notes that many Plan discussions have focused on permitting. To provide clarity and assist future users of the Plan, CalCIMA proposes the addition of a concise, high-level permitting background in a new Section 1.1.3. The proposed language, attached as **CalCIMA Suggested Amendment 1 – Permitting**, references both statute and the Department's website, and is intended to orient stakeholders needing permits to the proper locations and inform future dialogue on the Plan.

Amendment 2: Clarify Status of Existing Homes and Previously Entitled Projects

Much of the public testimony has centered on existing homes, infrastructure, and development projects that predate the Act. These entities, often conditioned under prior regulatory regimes such as the California Native Plant Act, face unique challenges with respect to avoidance and minimization requirements.

We propose that the Plan explicitly recognize these projects as having met their avoidance and minimization obligations under previously applicable laws, thereby leaving mitigation as the primary remaining requirement. To this end, we request the following addition to Section 5.2.1 ("Impact Avoidance and Minimization"):

"The first priority for conservation of western Joshua tree and its habitat is to avoid adverse [climate](#) impacts altogether. Although climate change stress may be impossible to avoid in the short-term, other impacts are avoidable, such as project-related degradation and destruction of habitat. [However, it should be recognized that existing homes, and public and private development projects, do not have the same avoidance and minimization opportunities as new projects brought forward after the Act's adoption. Further as identified previously in this plan, such existing homes and projects may have had avoidance and minimization measures imposed under prior laws \(e.g. California Native Plant Act\). Such existing projects and essential infrastructure authorized prior to the Act's adoption are recognized as achieving their avoidance and minimization obligations by virtue of meeting their adopted obligations at the time of project approval, authorization or legislative creation. For new projects,](#) Impact avoidance should be emphasized as the first preferred choice whenever feasible, especially in areas identified as climate refugia. Furthermore, the importance of avoiding take to western Joshua tree and its habitat has been emphasized during discussions with Tribes, in

particular the principle of not harming a tree unless it is absolutely critical for people (FIICPI, pers comm., 2024b).”

The language is attached as **CalCIMA Amendment 2 – Pre-Existing Projects**.

Amendment 3: Add Management Action 1.6 – Avoid Impacts from Mineral Development

The Plan should from the outset encourage mining operations to proactively support western Joshua tree conservation through reclamation efforts. Specifically, where mining reclamation plans under SMARA include western Joshua tree planting or relocation, such actions should be recognized as avoidance and minimization measures.

While not all mines will pursue this approach—due to differing end uses based on community and landowner needs those that do should be supported and encouraged. The proposed language, attached as **CalCIMA Amendment 3 – Mineral development**, reads as follows:

“Action A&M 1.6: Avoid Impacts from Mineral Development”

Reclamation of surface mining operations under the Surface Mining and Reclamation Act (SMARA) is recognized as achieving minimization and avoidance where the reclamation plan includes a revegetation plan addressing western Joshua trees, including without limitation, planting and/or relocation of western Joshua trees. “

Amendment 4 – Avoidance and Minimization Safe Harbor for Relocated and Preserved Trees

Current statutory protections around relocation are inadequate and may unintentionally disincentivize preservation. As multiple witnesses testified, project proponents and homeowners are discouraged from maintaining relocated trees due to long-term economic burdens and the costs of recurring potential impacts.

There is an urgent need to create provisions that protect those who choose to preserve relocated trees, either on- or off-site, from future regulatory liability as well as other preserved trees on the site. Without such a mechanism, we risk incentivizing “take” over relocation—a perverse outcome that undermines the conservation goals of the Act.

This proposal, CalCIMA Suggested Amendment 4 – Relocated and Preserved Trees, aims to encourage tree preservation by removing the regulatory and financial disincentives currently in place to maintaining trees on site. The language is attached as **CalCIMA Amendment 4 – Relocated and Preserved Trees**.

In conclusion, CalCIMA believes that addressing these four key areas in the initial Plan is essential to:

- Provide necessary background for permitting,
- Establish clarity around the legal transition between prior and current requirements,
- Promote habitat restoration by mineral developers, and
- Create a Safe Harbor for Relocated and Preserved Trees.

We appreciate your consideration of these amendments and look forward to continued collaboration and discussion.

Respectfully,



Adam Harper
Senior Director of Policy
CalCIMA

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Western Joshua Tree Conservation Plan



CalCIMA Suggested Amendment 1: Add Introduction Addition 1.1.3:
Background of the Western Joshua Tree Conservation Act – Permitting

VOLUME I: WESTERN JOSHUA TREE CONSERVATION PLAN

**Draft Presented to the
California Fish and Game Commission**

DECEMBER 2024



1.1.2 Background of the Western Joshua Tree Conservation Act

In October 2019, the Center for Biological Diversity submitted to the Commission a petition to list western Joshua tree as threatened under CESA. The petition identified climate change and wildland fires as the greatest threats to the persistence of the species. It also included habitat loss due to development; seed and plant predation, especially during drought; and competition with invasive species as other factors affecting the species' ability to survive and reproduce (Center for Biological Diversity 2019).

The Commission found, based in part on CDFW's evaluation of the petition and related recommendation, that there was sufficient information indicating that listing the species as threatened under CESA may be warranted. The Commission designated western Joshua tree a candidate species in September 2020 (CDFW 2022), conferring upon western Joshua tree temporary legal protection under CESA.

CDFW evaluated the petition and submitted a written status review report to the Commission in March 2022 (CDFW 2022). The report concluded that western Joshua tree is not likely to be in danger of becoming extinct throughout all, or a significant portion, of its range in the foreseeable future in the absence of special protection and management efforts required by CESA. In June 2022, the Commission considered the status review report and could not reach a decision regarding whether listing the species as threatened was warranted. In February 2023, while the Commission was still considering its final decision on the petition, legislation was introduced to protect western Joshua tree. In response to the legislative proposal, the Commission postponed further consideration of the petition under CESA.



Source: National Park Service.



In July 2023, the California State Legislature passed and the governor signed into law WJTCA, codifying as Chapter 11.5 of Division 2 of the California Fish and Game Code (commencing with Fish & G. Code, § 1927). WJTCA does the following:

- Provides protections for western Joshua tree by prohibiting the import, export, take, possession, purchase, or sale of any western Joshua tree in California (Fish & G. Code, § 1927.2, subd. (a)). Pursuant to Fish and Game Code Section 86, “take” means “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.”
- Allows CDFW to authorize take of western Joshua tree if certain conditions are met (Fish & G. Code, § 1927.3, subds. (a)-(b)).
- Authorizes CDFW to enter into a written agreement with any county or city to delegate to the county or city limited authority to authorize take of western Joshua tree if specified conditions are met (Fish & G. Code, § 1927.3, subd. (c)).
- Allows CDFW to authorize, by issuing permits, the removal or trimming of dead western Joshua trees or the trimming of live western Joshua trees that pose a risk to structures or public health and safety if certain conditions are met. (Fish & G. Code, § 1927.4, subd. (a)).
- Authorizes CDFW to enter into a written agreement with any county or city to delegate to the county or city limited authority to authorize the removal or trimming of dead western Joshua trees or the trimming of live western Joshua trees that pose a risk to structures or public health and safety if specified conditions are met (Fish & G. Code, § 1927.4, subd. (b)-(c)).
- Allows permittees to elect to pay specified fees in lieu of completing mitigation obligations (Fish & G. Code, § 1927.3, subd. (a)(3)).
- Establishes the Western Joshua Tree Conservation Fund (Conservation Fund). Any monies in the fund will be continuously appropriated to CDFW solely for the purposes of acquiring, conserving, and managing conservation lands and completing other activities to conserve western Joshua tree. (Fish & G. Code, § 1927.5, subd. (a)).
- Directs CDFW to develop and implement a conservation plan for western Joshua tree in collaboration with the Commission, other governmental agencies, California Native American tribes, and the public. (Fish & G. Code, § 1927.6, subd. (a)). CDFW must consult with California Native American tribes and include co-management principles (Fish & G. Code, § 1927.6, subd. (b)). CDFW must present the draft Conservation Plan at a public meeting of the Commission no later than December 31, 2024, and WJTCA calls for the Commission to take final action on the plan by June 30, 2025. (Fish & G. Code, § 1927.6, subd. (a)).
- Directs CDFW to submit an annual report assessing the conservation status of western



Joshua tree to the Commission and the State Legislature by January 31 of each year, starting in 2025 (Fish & G. Code, § 1927.7, subd. (a)).

- Requires CDFW to submit to the Commission an updated status review report by January 1, 2033, unless the Commission directs CDFW to complete it sooner (Fish & G. Code, § 1927.2, subd. (c)(2)(F) & 1927.9). The Commission shall consider determining whether the petitioned action to list western Joshua tree under CESA is warranted (Fish & G. Code, § 1927.9). In the interim, western Joshua tree is, and will remain, a candidate species under CESA.

1.1.3 Background of the Western Joshua Tree Conservation Act – Permitting

The Western Joshua Tree Conservation Act created an in-lieu fee Permitting system for homeowners and businesses taking western Joshua Tree's in California. The Act has a dual mission of enabling development and providing for conservation of the western Joshua Tree. The Act's provisions are separate from the conservation plan but provide important legislative direction for the plan to establish conservation tools and policies. In addition, the legislature enabled local governments to have the authority to grant western Joshua Tree Incidental Take permits for single-family residences, multifamily residences, accessory structures, and public works projects concurrent with providing project approvals.

In establishing this Direction, the legislature defined the permitting criteria developers and homeowners taking western Joshua Tree would need to meet in Fish and Game Code Subsection 1927.3 (a)(1)-(4):

“(a) The department may authorize, by permit, the taking of a western Joshua tree if all of the following conditions are met:

(1) The permittee submits to the department for its approval a census of all western Joshua trees on the project site, including size information and photographs, that categorize the western Joshua trees according to the following size classes:

(A) Less than one meter in height.

(B) One meter or greater but less than five meters in height.

(C) Five meters or greater in height.

(2) The permittee avoids and minimizes impacts to, and the taking of, the western Joshua tree to the maximum extent practicable. Minimization may include trimming, encroachment on root systems, relocation, or other actions that result in detrimental but nonlethal impacts to a western Joshua tree.

(3) The permittee mitigates all impacts to, and taking of, the western Joshua tree. The measures required to meet this obligation shall be roughly proportional in extent to the impact of the authorized taking of the species. When various measures are available to meet this obligation, the measures required shall maintain the permittee's objectives to the greatest extent possible. All required measures shall be capable of successful implementation. The permittee shall ensure adequate funding to implement the mitigation measures. In lieu of completing the mitigation obligation on its own, the permittee may elect to satisfy this mitigation obligation by paying fees, pursuant to the fee schedule in subdivision (d) or (e), for deposit into the fund.



(4) (A) The department may include permit conditions that require the permittee to relocate one or more of the western Joshua trees. If relocation is required, the permittee shall implement measures to assist the survival of relocated trees, and to comply with any other reasonable measures required by the department to facilitate the successful relocation and survival of the western Joshua trees. These relocation measures shall include, but are not limited to, all of the following:

- (i) A requirement that the relocated western Joshua tree is placed in a location and with proper orientation to improve its survival.
- (ii) A requirement that western Joshua trees are relocated at a time that maximizes their survival when feasible.
- (iii) A requirement that a desert native plant specialist be onsite to oversee relocation."

The Department Maintains a permitting website available at the following location (<https://wildlife.ca.gov/Conservation/Environmental-Review/WJT/Permitting/WJTCA-ITP>). Members of the public interested in applying for permits can find the necessary documents and forms at this website.

1.2 CONSERVATION PLAN VISION, PURPOSE, AND OBJECTIVES

1.2.2 Vision

The vision of the Conservation Plan is to prevent the extinction of western Joshua tree in the wild, preserve functioning ecosystems that support western Joshua tree, and maintain sustainable populations of western Joshua tree in California over the long term, such that listing the species under CESA will not be warranted.

1.2.3 Purpose

The purpose of the Conservation Plan is to fulfill the requirements articulated in Fish and Game Code Section 1927.6. Upon approval by the Commission, the Conservation Plan will guide the conservation of western Joshua tree in California by focusing on the most urgent and important management actions, as informed by science including TEK; collaboration with California Native American tribes; collaboration with federal, state, and local government agencies; and public feedback.

1.2.4 Objectives

The following objectives are identified in WJTCA:

- Describe management actions necessary to conserve western Joshua tree and objective, measurable criteria to assess the effectiveness of such actions (Fish & G. Code, §1927.6, subd. (a)).



- Provide guidance for the avoidance and minimization of impacts to western Joshua trees (Fish & G. Code, § 1927.6, subd. (a)).
- Include in the Conservation Plan protocols for the successful relocation of western Joshua trees and provide for the relocation of western Joshua trees to tribal lands upon a request from a Tribe (Fish & G. Code, § 1927.6, subds. (a)-(b)).
- Include co-management principles and incorporate Traditional Ecological Knowledge into the Conservation Plan (Fish & G. Code, § 1927.6, subd. (b)).
- Prioritize actions and acquiring and managing lands that are identified as appropriate for western Joshua tree conservation (Fish & G. Code, § 1927.6, subd. (c)).

1.2.5 Geographic Focus Area

The Conservation Plan includes a geographic focus area for conservation activities encompassing 37,749 square kilometers (9,327,981 acres, or 14,575 square miles) in southeastern California. It reflects the general location of currently occupied western Joshua tree habitat plus an 8-kilometer (5-mile) buffer in California to encompass areas that could be suitable for implementation of conservation management actions (Figure 1-2). However, application of WJTCA and implementation of the management actions described in the Conservation Plan (see Chapter 5, “Conservation Management Actions and Effectiveness Criteria”) are not limited to the geographic focus area. In addition, the geographic focus area may be modified through amendment of this Conservation Plan based on evolving information regarding current and future western Joshua tree habitat resulting from ongoing scientific analysis.



CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Western Joshua Tree Conservation Plan



CalCIMA Suggested Amendment 2: – Impact Avoidance and Minimization –
Existing Homes and Public and Private Projects

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Draft Presented to the California Fish and Game Commission

DECEMBER 2024



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5.2.1 Impact Avoidance and Minimization

The first priority for conservation of western Joshua tree and its habitat is to avoid adverse [climate](#) impacts altogether. Although climate change stress may be impossible to avoid in the short- term, other impacts are avoidable, such as project-related degradation and destruction of habitat. [However, it should be recognized that existing homes, and public and private development projects, do not have the same avoidance and minimization opportunities as new projects brought forward after the Act's adoption. Further as identified previously in this plan, such existing homes and projects may have had avoidance and minimization measures imposed under prior laws \(e.g. California Native Plant Act\). Such existing projects and essential infrastructure authorized prior to the Act's adoption are recognized as achieving their avoidance and minimization obligations by virtue of meeting their adopted obligations at the time of project approval, authorization or legislative creation. For new projects,](#) Impact avoidance should be emphasized as the first preferred choice whenever feasible, especially in areas identified as climate refugia. Furthermore, the importance of avoiding take to western Joshua tree and its habitat has been emphasized during discussions with Tribes, in particular the principle of not harming a tree unless it is absolutely critical for people (FII CPI, pers comm., 2024b).

When complete avoidance cannot be achieved, efforts should be made to minimize impacts on western Joshua tree and its habitat, and the presence of tribal cultural monitors and a trained arborist to minimize these impacts are encouraged (FII CPI, pers. comm., 2024a). Minimization may include efforts to reduce the number of trees and seeds taken; the area of habitat that is lost or degraded; the severity of impacts on individual trees; impacts on other organisms on which western Joshua tree depends; and indirect impacts on trees, seeds, habitats, and other ecologically related organisms.

The avoidance and minimization actions in this section could be voluntarily adopted and implemented by project proponents and land managers, incorporated into project approvals by local governments and regulatory agencies, or incorporated into voluntary, cooperative agreements between relevant agencies, organizations, and other parties. The Western Joshua Tree Conservation Act (WJTCA) requires the avoidance and minimization of impacts on western Joshua tree to the maximum extent practicable as a condition of obtaining a WJTCA incidental take permit (ITP) (Fish & G. Code, § 1927.3, subd. (a)(2)). WJTCA also states that the Conservation Plan shall include guidance for the avoidance and minimization of impacts on western Joshua trees and protocols for the successful relocation of western Joshua trees (Fish & G. Code, § 1927.6, subd. (a)).

The impact avoidance and minimization (A&M) management actions listed in this chapter are intended to promote the survival of existing western Joshua trees and the protection of their



habitat where they could potentially be harmed by development, human activities, and natural hazards. Impacts on western Joshua trees could occur from urban development, infrastructure construction, resource extraction, damage by people and vehicles, and other forms of landscape alteration (see Section 4.3). When these activities affect the root systems or the seedbanks of western Joshua tree, the survival of populations can be compromised.



CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Western Joshua Tree Conservation Plan



CalCIMA Suggested Amendment 3: Additions – Avoid Direct and Indirect Impacts
Add New Management Action 1.6 – Avoid Impacts from Mineral Development

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MANAGEMENT ACTION A&M 1: AVOID DIRECT AND INDIRECT IMPACTS

When landscape-altering projects occur near western Joshua trees, avoidance buffers should be established to avoid direct impacts on aboveground and belowground western Joshua tree parts and their seedbank. Scientific information on western Joshua tree root ball width, root zone width, and seedbank width was used to inform direct impact avoidance buffers. Direct impact buffers for avoidance should apply to ground-disturbing activities, such as construction and resource extraction, fire control and suppression, and any other actions that could harm or kill western Joshua trees or seeds. The following actions provide activity-specific guidance for direct impact avoidance.

Action A&M 1.1: Retain Healthy Trees

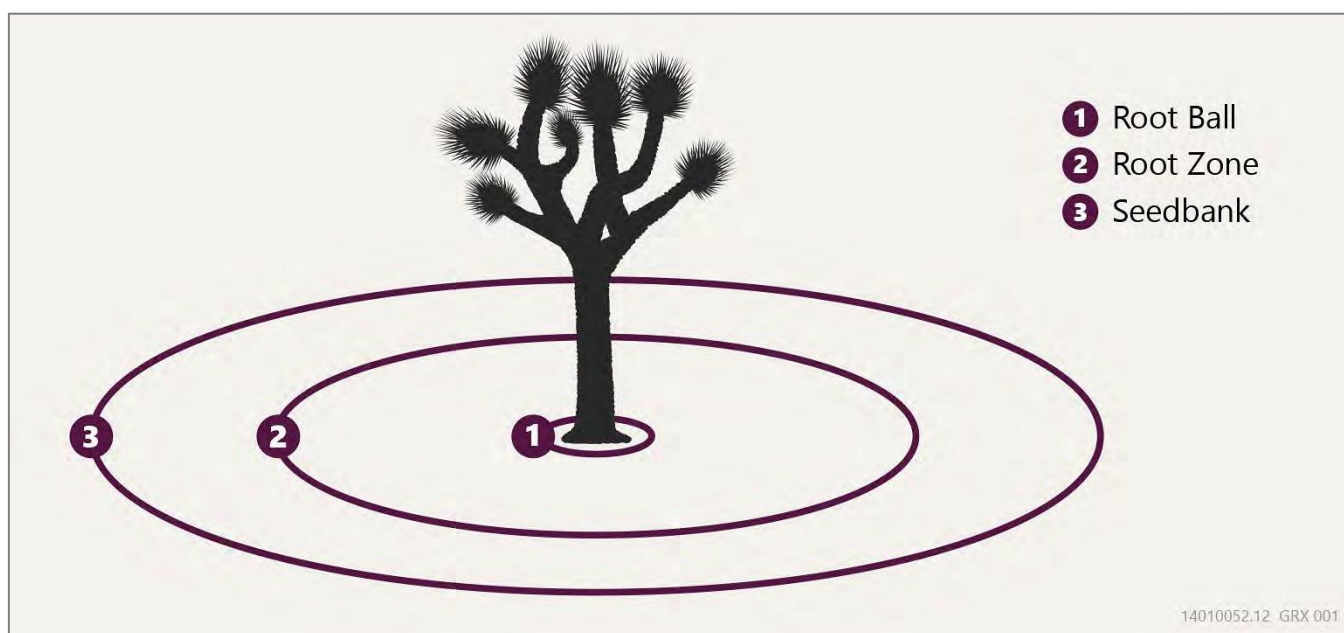
Project proponents (e.g., private and public entities) or agencies (e.g., local, state, and federal agencies) should prioritize retaining healthy western Joshua trees in place when planning a project. Mature/reproductive western Joshua trees in good condition, western Joshua trees in areas within and adjacent to contiguous suitable habitat, and western Joshua trees in habitat that is prioritized as having high value for conservation should be prioritized for retention in place. Signs a tree is healthy may include 60 percent or more living branches, minimal pest damage, recent unrestricted hard growth, recent flowering, and strong tree vigor (see Appendix E, "Relocation Guidelines and Protocols").

Action A&M 1.2: Implement Avoidance Buffers

When activities occur in the vicinity of western Joshua trees, project proponents, land managers, and agencies should implement buffers around western Joshua trees to avoid direct impacts (see Figure 5-1). In accordance with western Joshua tree primary seed dispersal distances, root growth, and salvage techniques, CDFW recommends buffers to avoid impacts for certain activities. The recommended minimum buffers for ground disturbance are:

- 56.7 meters (186 feet) from the base of a mature (i.e., sexually reproductive) western Joshua tree to avoid impacts on the primary seed dispersal zone,
- 15 meters (50 feet) from the base of a western Joshua tree 1 meter or greater in height or 7.5 meters (25 feet) from a western Joshua tree less than 1 meter (3.3 feet) in height to avoid damage to the root zone, and
- 0.61 meters (2 feet) from the base of a western Joshua tree 1 meter or greater in height or 0.3 meters (1 foot) less than 1 meter (3.3 feet) in height to avoid impacts on the root ball (i.e., the mass of soil that contains concentrated roots growing from the base of the stem of a western Joshua tree).





Note: Graphical representation of buffer zones (not to scale).

Source: Compiled by Ascent in 2024.

Figure 5-1 Western Joshua Tree Buffer Zones

These recommended buffers may be adjusted based on project-specific information and impacts. Additional information to consider when determining a buffer may include, but is not limited to:

- Density of trees within each project site as provided by the project census or other biological survey information.
- Location of a tree in relation to existing structures, such as fences, driveways, or other permanent structures.
- Intensity of proposed ground-disturbing activities (e.g., trenching and excavation impacts may be different than installing fencing).
- Duration of proposed impacts (temporary or permanent).
- Additional minimization measures to reduce impacts of buffer encroachment (e.g., supplemental watering, protecting roots and trees from access, or avoiding equipment damage, etc.).
- Geographic location (e.g., Is the project located in an urban area or within targeted climate refugia?).
- Life stage of tree, including reproductive stage. Branched trees are more likely to have produced seed and may have more extensive root structures.



Disturbances outside of these buffers are less likely to negatively affect the health and survival of the tree or its seeds. CDFW will continue to review the science including TEK on western Joshua tree during implementation of the Conservation Plan and update impact avoidance buffers as appropriate.

Action A&M 1.3: Avoid Impacts during Pesticide Application

Project proponents, landowners, land managers, and agencies should not apply pesticides on western Joshua trees and should implement best management practices that avoid pesticide drift onto western Joshua trees, nontarget native vegetation (e.g., nurse plants), pollinators, and seed-dispersing rodents. See Action A&M 1.3.1, "Avoid Impacts during Pesticide Application" in Appendix D for recommended best management practices related to this Action.

Action A&M 1.4: Avoid Impacts Related to Unauthorized Vehicle Use

Land managers should implement measures to prohibit unauthorized off-highway vehicle (OHV) and other vehicle use off designated trails in western Joshua tree habitat, such as by closing areas outside of designated routes with signage, vertical mulching, or installing other barriers. On public lands authorized for open, overland OHV recreation within western Joshua tree habitat, vehicle use rules should be modified to restrict travel to existing designated trails.

Action A&M 1.5: Avoid Impacts from Overgrazing

Land managers and regulatory agencies should prohibit grazing activities within western Joshua tree habitat if grazing is causing adverse effects. This can be accomplished by not renewing existing grazing leases, excluding portions of allotments with western Joshua trees, and installing property fences to avoid free range or trespass grazing. Feral, nonnative grazing animals (e.g., burros, horses) should be removed or relocated from western Joshua tree habitat. However, targeted grazing by prescribed herbivory may be useful to reduce annual invasive species (see Action A&M 2.7, "Minimize Impacts from Grazing Activities," and Appendix D, Action A&M 3.5.1, "Implement Fuel Treatments") (Berryman et al. 2023).

Action A&M 1.6: Avoid Impacts from Mineral Development

Reclamation of surface mining operations under the Surface Mining and Reclamation Act (SMARA) is recognized as achieving minimization and avoidance where the reclamation plan includes a revegetation plan addressing western Joshua trees, including without limitation, planting and/or relocation of western Joshua trees.



CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Western Joshua Tree Conservation Plan



CalCIMA Suggested Amendment 4: Urgent Clarification Additions – Avoid Direct and Indirect Impacts

Add New Management Action 1.7 – *On-Site Relocated or Preserved Trees*

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Draft Presented to the California Fish and Game Commission

DECEMBER 2024



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MANAGEMENT ACTION A&M 1: AVOID DIRECT AND INDIRECT IMPACTS

When landscape-altering projects occur near western Joshua trees, avoidance buffers should be established to avoid direct impacts on aboveground and belowground western Joshua tree parts and their seedbank. Scientific information on western Joshua tree root ball width, root zone width, and seedbank width was used to inform direct impact avoidance buffers. Direct impact buffers for avoidance should apply to ground-disturbing activities, such as construction and resource extraction, fire control and suppression, and any other actions that could harm or kill western Joshua trees or seeds. The following actions provide activity-specific guidance for direct impact avoidance.

Action A&M 1.1: Retain Healthy Trees

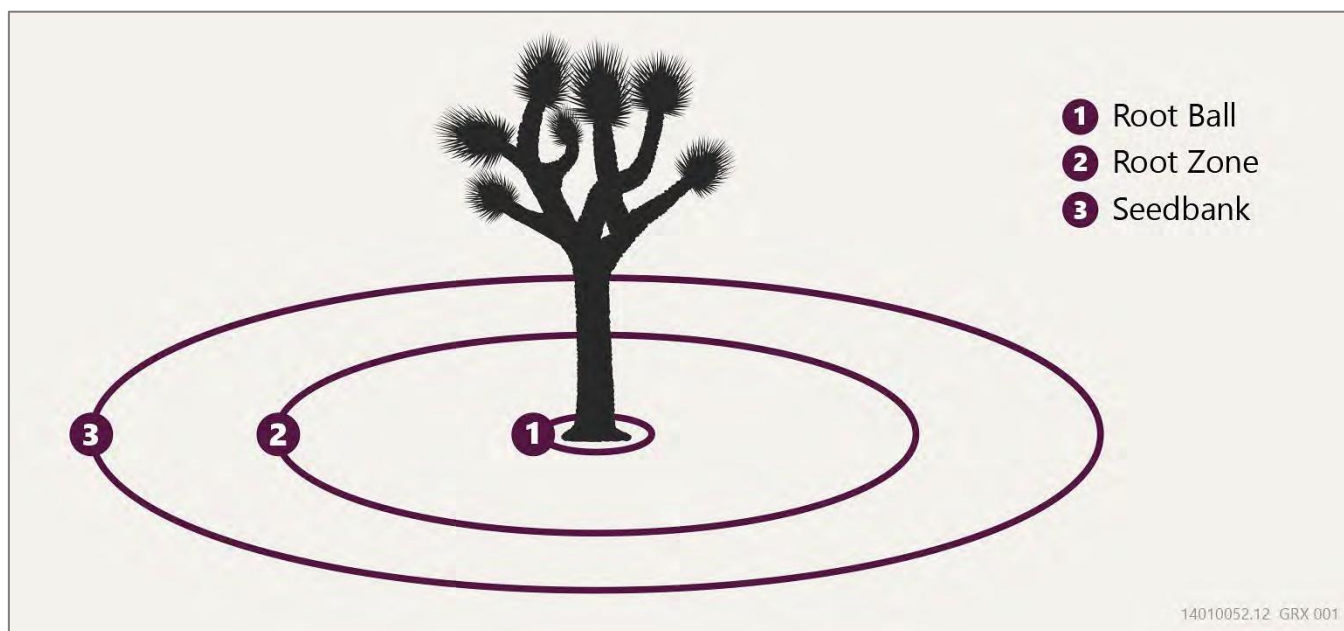
Project proponents (e.g., private and public entities) or agencies (e.g., local, state, and federal agencies) should prioritize retaining healthy western Joshua trees in place when planning a project. Mature/reproductive western Joshua trees in good condition, western Joshua trees in areas within and adjacent to contiguous suitable habitat, and western Joshua trees in habitat that is prioritized as having high value for conservation should be prioritized for retention in place. Signs a tree is healthy may include 60 percent or more living branches, minimal pest damage, recent unrestricted hard growth, recent flowering, and strong tree vigor (see Appendix E, “Relocation Guidelines and Protocols”).

Action A&M 1.2: Implement Avoidance Buffers

When activities occur in the vicinity of western Joshua trees, project proponents, land managers, and agencies should implement buffers around western Joshua trees to avoid direct impacts (see Figure 5-1). In accordance with western Joshua tree primary seed dispersal distances, root growth, and salvage techniques, CDFW recommends buffers to avoid impacts for certain activities. The recommended minimum buffers for ground disturbance are:

- 56.7 meters (186 feet) from the base of a mature (i.e., sexually reproductive) western Joshua tree to avoid impacts on the primary seed dispersal zone,
- 15 meters (50 feet) from the base of a western Joshua tree 1 meter or greater in height or 7.5 meters (25 feet) from a western Joshua tree less than 1 meter (3.3 feet) in height to avoid damage to the root zone, and
- 0.61 meters (2 feet) from the base of a western Joshua tree 1 meter or greater in height or 0.3 meters (1 foot) less than 1 meter (3.3 feet) in height to avoid impacts on the root ball (i.e., the mass of soil that contains concentrated roots growing from the base of the stem of a western Joshua tree).





Note: Graphical representation of buffer zones (not to scale).

Source: Compiled by Ascent in 2024.

Figure 5-1 Western Joshua Tree Buffer Zones

These recommended buffers may be adjusted based on project-specific information and impacts. Additional information to consider when determining a buffer may include, but is not limited to:

- Density of trees within each project site as provided by the project census or other biological survey information.
- Location of a tree in relation to existing structures, such as fences, driveways, or other permanent structures.
- Intensity of proposed ground-disturbing activities (e.g., trenching and excavation impacts may be different than installing fencing).
- Duration of proposed impacts (temporary or permanent).
- Additional minimization measures to reduce impacts of buffer encroachment (e.g., supplemental watering, protecting roots and trees from access, or avoiding equipment damage, etc.).
- Geographic location (e.g., Is the project located in an urban area or within targeted climate refugia?).
- Life stage of tree, including reproductive stage. Branched trees are more likely to have produced seed and may have more extensive root structures.



Disturbances outside of these buffers are less likely to negatively affect the health and survival of the tree or its seeds. CDFW will continue to review the science including TEK on western Joshua tree during implementation of the Conservation Plan and update impact avoidance buffers as appropriate.

Action A&M 1.3: Avoid Impacts during Pesticide Application

Project proponents, landowners, land managers, and agencies should not apply pesticides on western Joshua trees and should implement best management practices that avoid pesticide drift onto western Joshua trees, nontarget native vegetation (e.g., nurse plants), pollinators, and seed-dispersing rodents. See Action A&M 1.3.1, "Avoid Impacts during Pesticide Application" in Appendix D for recommended best management practices related to this Action.

Action A&M 1.4: Avoid Impacts Related to Unauthorized Vehicle Use

Land managers should implement measures to prohibit unauthorized off-highway vehicle (OHV) and other vehicle use off designated trails in western Joshua tree habitat, such as by closing areas outside of designated routes with signage, vertical mulching, or installing other barriers. On public lands authorized for open, overland OHV recreation within western Joshua tree habitat, vehicle use rules should be modified to restrict travel to existing designated trails.

Action A&M 1.5: Avoid Impacts from Overgrazing

Land managers and regulatory agencies should prohibit grazing activities within western Joshua tree habitat if grazing is causing adverse effects. This can be accomplished by not renewing existing grazing leases, excluding portions of allotments with western Joshua trees, and installing property fences to avoid free range or trespass grazing. Feral, nonnative grazing animals (e.g., burros, horses) should be removed or relocated from western Joshua tree habitat. However, targeted grazing by prescribed herbivory may be useful to reduce annual invasive species (see Action A&M 2.7, "Minimize Impacts from Grazing Activities," and Appendix D, Action A&M 3.5.1, "Implement Fuel Treatments") (Berryman et al. 2023).

Action A&M 1.7: On-Site Relocated or Preserved Trees

Western Joshua Trees that are relocated on-site and monitored and maintained consistent with the Western Joshua Tree Relocation Guidelines and Protocols provided by CDFW (presented in Appendix E) have a safe harbor for all non-lethal take of the tree as do trees identified as preserved on-site. Actions undertaken following the guidance of a certified arborist, a licensed landscape architect, or a biologist in support of the survival of preserved or on-site relocated trees shall presumptively demonstrate that any tree mortality was the result of unsuccessful preservation efforts, was unintentional, and that impacts to the tree had been properly avoided and minimized. These preserved and relocated trees by virtue of having already been subject to a voluntary mitigation fee under the Act are also fully mitigated in perpetuity.



From: Matthew Hinck <mhinck@calportland.com>

Sent: Friday, May 9, 2025 01:48 PM

To: FGC <FGC@fgc.ca.gov>

Subject: CalPortland Comments on WJT Relocation Plan and Chapter 5 of Conservation Plan

Good Afternoon - Please find CalPortland comments and suggested language changes related to the Western Joshua Tree Conservation Plan and Relocation Guides.

The comments are primarily focused on the large projects and the potential for revegetation and other minimization efforts in mine reclamation areas.

Please let me know if you have any questions

Best Regards

—

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5 CONSERVATION MANAGEMENT ACTIONS AND EFFECTIVENESS CRITERIA

Management actions necessary to conserve western Joshua tree and objective, measurable criteria to assess the effectiveness of such actions are the heart of the Conservation Plan. This chapter describes the breadth of actions that are likely to be necessary to conserve western Joshua tree and provides a conceptual framework for how to use these actions to achieve the vision, purpose, and objectives of the Conservation Plan described in Chapter 1, “Introduction.”

“Wilderness is not a luxury but a necessity of the human spirit.”
— Edward Abbey

The management actions are guidelines for conservation and the criteria help define the effectiveness of the actions; they do not create new statutory or regulatory mandates. Nevertheless, the management actions in this chapter can be used in several ways. They can be voluntarily adopted and implemented by project proponents, land managers, and philanthropists to help the species or to prevent the species from being harmed. California Native American tribes (Tribes) and the State can work together to co-manage conservation consistent with the Conservation Plan’s guidance. The management actions can also be incorporated into project approvals by local governments and regulatory agencies that authorize projects in western Joshua tree’s range in California. Researchers can implement management actions related to research, and private citizens and other organizations can implement actions related to education and awareness. Western Joshua tree conservation will require action from many different people and organizations.



Section 5.1 introduces the sources of information behind western Joshua tree conservation. Section 5.2 includes descriptions of management actions in five categories:

- Impact avoidance and minimization,
- Land conservation and management,
- Tribal co-management,
- Research to inform long-term conservation, and
- Education and awareness.

Section 5.3 provides objective, measurable criteria to assess the effectiveness of management actions, the Conservation Plan, and the Western Joshua Tree Conservation Fund (Conservation Fund) for conservation of western Joshua tree in California. Section 5.4 is intended to guide which management actions may be most impactful for conservation in specific western Joshua tree management units.

5.1 SCIENCE INCLUDING TRADITIONAL ECOLOGICAL KNOWLEDGE TO INFORM MANAGEMENT ACTIONS

The Conservation Plan is informed by science including Traditional Ecological Knowledge (TEK). Integration of TEK with other sources of science has been shown to lead to more sustainable, productive, and locally accepted natural resource management systems worldwide (Bussey et al. 2016). Please refer to Chapter 3, "Traditional Values and Uses of Western Joshua Tree by California Native American Tribes," for a description of California Native American uses, values, and TEK related to western Joshua tree. Refer to Section 5.2.3, below, for management actions facilitating co-equal collaboration between the State and Tribes.

The critical role of science supporting effective management and conservation of the species is reflected in the seven-step approach to conservation in the face of climate change described by Smith et al. (2023), as summarized below.

1. **Identify genetic structure and distinct populations.** The first step toward conservation is identifying genetic structure and distinct populations. Genomic (i.e., study of genes) tools can provide accurate estimates regarding populations, such as effective population size, demographic history, and population structure, which are all important for successful conservation efforts (Hohenlohe et al. 2021). Genetic data of populations can be used to identify distinct populations, as well as genes that may be responsible for adaptation to changing environments, highlighting populations that may require different management strategies (Hohenlohe et al. 2021). As discussed in Section 4.1.1, "Range and Distribution," recent research suggests that western Joshua tree populations have significant genetic differences (Smith et al. 2021) that have the potential to respond



differently to climate change (Smith et al. 2023). Population genetic data can also assist in identifying populations with high genetic diversity, which can translate to greater potential for adapting to environmental change (Smith et al. 2023).

2. **Develop species distribution models and identify climate refugia.** Developing species distribution and demographic models for distinct populations using high-quality data that document where western Joshua trees occur (i.e., occurrence data) is important for accurately identifying climate refugia that should be given high priority for protection. These models are imperative for successful species conservation (Morelli et al. 2016; Morelli et al. 2020) and will help determine the degree that climate change poses a threat to a species (Jones et al. 2016). The several species distribution models that have been developed for Joshua tree resulted in very different predictions of suitable habitat distribution by the end of the 21st century (Smith et al. 2023). The wide range of results from these models is a byproduct of different methods used and differences in input data (Smith et al. 2023). For species distribution models to be reliable, accurate occurrence data must be used, then multiple independent data sources must be used to validate models (Sweet et al. 2019). Incorporating physiological (i.e., how plants function) data can also improve the accuracy of species distribution models (Buckley et al. 2010; Evans et al. 2015). Species distribution models can help predict areas of future habitat for a species; however, these models need to include realistic estimates of the species' ability to disperse and access new areas (Bateman et al. 2013). Species distribution models may improve their ability to predict future species distributions under climate change, by incorporating the adaptive potential of populations (Bush et al. 2016; Razgour et al. 2019). Models should focus on fine scale distribution as genetic information becomes available and distinct populations are identified since they may require different management strategies (Hohenlohe et al. 2021).

An important step toward developing accurate range-wide species distribution and climate refugia models for western Joshua tree has been completed with new species distribution data recently published by Esque et al. (2023). These models used remote sensing and ground-validation methodologies to document western Joshua tree presence and absence throughout the species range. This unprecedented dataset has been used to develop climate refugia models that include identification of possible future habitat that is within dispersal range of its current distribution, but that is not currently populated by western Joshua tree (Shryock et al. forthcoming). These data informed management unit delineation in Section 4.4, "Management Units," land conservation and management actions in Section 5.2.2 (below), and management unit recommendations in Section 5.4 (below).



3. **Validate potential refugia.** Once refugia models have been developed, the next step is to validate the models using demographic data to assess population growth or decline and other data sources to confirm that the potential refugia will be viable in the long term (Sweet et al. 2019). Demographic data can have considerable influence on predicted future species distributions and in validating predicted climate refugia (Merow et al. 2014). Spatial patterns of recruitment can also be used as a predictor of potential climate refugia, which could be compared to predictions based on climate models (Barrows et al. 2020a, 2020b). In addition, incorporating information on the adaptive potential of populations into species distribution models may improve model accuracy for future distribution predictions under climate change (Bush et al. 2016; Razgour et al. 2019).
4. **Assess adaptive genetic variation.** After genetic structure and distinct populations have been identified, the next step is to assess adaptive genetic variation within populations using either association genetics (i.e., identification of genes or genetic markers with underlying important traits) or ideally, experimental approaches coupled with genomic data (Smith et al. 2023). Conservation genetics should focus on the protection of adaptive genetic variation to help manage species that are dealing with climate change (Razgour et al. 2019). Adaptive genetic variation directly affects a species' ability to respond to environmental factors, such as heat stress and drought, highlighting the importance of conserving adaptive genetic variation and not just overall genetic variation (Smith et al. 2023). Landscape genomics (i.e., study of how genetic variation is distributed between populations across a species range) and association genetics can identify genes or genetic markers that are likely the basis for local adaptation to climate variation in current populations (Lotterhos and Whitlock 2015).



Source: Jeb Bjerke, California Department of Fish and Wildlife.

Genome-wide association studies looking at seedling survival, growth, and specific ecophysiological traits (i.e., physiological processes crucial for interacting with the environment, including gas exchange and water regime) can potentially identify genes underlying climate adaptation (Smith et al. 2023), which can be used to predict these traits in natural populations (Swarts et al. 2017). Studies in common gardens are



particularly important because they can be used to validate the adaptive value of identified genes or genetic markers and reveal underlying physiological mechanisms (Weigel and Nordborg 2015). Common garden experiments are indoor or outdoor plantings of species or populations collected from multiple distinct geographic locations, grown together under shared conditions (Schwinning et al. 2022).

Current common garden research within the US Geological Survey's Mojave Desert Common Gardens network uses Joshua tree seedlings from different locations that are planted outside in various climates throughout the Mojave Desert and in the lab. This research can help determine the extent to which different populations of Joshua tree are adapted to certain local climate conditions and identify the physiological mechanisms by which Joshua trees tolerate drought and heat stress (Smith et al. 2023). Another effort to identify Joshua tree genes and genetic markers associated with specific climate variables is supported by Revive and Restore, a leading wildlife conservation nonprofit organization, to sequence the whole genome from individual Joshua trees sampled across the range of climates in which the species occurs (Smith et al. 2023).

Once climate-associated genes or genetic markers have been identified, the next step will be genotyping (i.e., analyzing genome sequence data) wild populations of Joshua tree to predict long-term potential of adaptation to warming climates (Smith et al. 2023). Populations identified to have the highest probability of adaptation and survival should be prioritized for conservation (Smith et al. 2023).

5. **Identify high priority areas for protection.** Informed by the results of the four steps described above, the next step will be to identify locations within each population that should have the highest priority for protection (Morelli et al. 2020). Determining whether there are any areas slated for development that contain climate refugia and then taking steps to try to protect these areas will be important (Smith et al. 2023). A Mojave Desert ecoregional assessment (Randall et al. 2010; Parker et al. 2018), which identified conservation value for a large portion of the western Joshua tree range, can also be used to help prioritize conservation lands. Even areas that have been identified as highly degraded may still have conservation value if potential refugia is present (Smith et al. 2023). In addition, some areas that have been identified as ecologically intact may experience severe damage due to climate change and, therefore, may have little long-term conservation value (Smith et al. 2023).

Identification of high priority areas for protection to further the conservation of western Joshua tree will be completed as needed by CDFW and partners and will be supported by information produced by the research and tribal communities. While it would be ideal to complete steps 1 through 4 before prioritizing areas for protection, CDFW must



begin work to conserve western Joshua tree immediately and must therefore begin initial prioritization of areas for protection based on the best, currently available information. As additional information generated from steps 1 through 4 becomes available, CDFW will incorporate it into decision making and future updates of the Conservation Plan.

An initial land-prioritization scheme guided by Smith et al. (2023) has been developed by CDFW (described in Section 5.2.2) to help identify high priority areas for protection.

6. **Protect priority areas while accommodating compatible existing and emerging land uses.** Informed by the results of step 5, high priority areas should be protected while accommodating existing and emerging land uses that are compatible with the overall western Joshua tree conservation strategy (Henson et al. 2018). This work should be done in collaboration with California Native American tribes, state and federal government agencies, local jurisdictions, nongovernmental organizations (NGOs), the public, and affected businesses and property owners. The Mojave Desert region is the homeland territory of many California Native American tribes and is made up of a diverse patchwork of land owned by tribes, federal, state, and local land ownerships and jurisdictions, including the National Park Service (NPS), the Bureau of Land Management (BLM), the US Forest Service (USFS), as well as state and county reserves (Smith et al. 2023). Focus should be on landscape-scale conservation criteria while also engaging with the public to create broad public support (Smith et al. 2023). CDFW will use the Conservation Fund to conserve priority lands.
7. **Identify other impacts and develop management to mitigate them.** The last step is to identify additional factors beyond climate change that could negatively affect the persistence of western Joshua tree (e.g., invasive species, incompatible recreation, inappropriate fire frequencies) and management efforts, including traditional cultural practices, to mitigate these impacts (Morelli et al. 2020). Other impacts on the persistence of western Joshua tree are identified in Section 4.3, "Key Stressors, Threats, and Conservation Issues," and mitigation approaches for them are presented in Section 5.2.1.





Source: Anna Cirimele, National Park Service.

There are marked challenges with identifying and protecting existing populations that meet all the necessary criteria for conservation. Some scientists have suggested assisted migration (i.e., human-assisted movement of species in response to climate change) as a management strategy for species limited by dispersal ability, such as Joshua tree (Cole et al. 2011; Williams and Dumroese 2013). However, some ecologists have strongly criticized assisted migration for its potential to promote invasive species, spread pathogens, and disrupt ecosystems (Ricciardi and Simberloff 2009). Assisted migration may have a high rate of failure if species or populations are strongly adapted to local conditions that are not present at the introduction site (Vitt et al. 2010). Although assisted migration has been suggested for Joshua trees, Smith et al. (2023) do not advise this method. This is partially due to suspected high costs and logistical planning needed for success, as well as this approach not preserving intact, functional ecosystems. In addition to what is outlined in Smith et al. (2023), given that there are climate refugia modeled within the current range of western Joshua tree (Shryock et al. forthcoming), it would be easier to protect the trees where they are currently growing compared with moving them to new places outside the current range. If assisted migration were employed, these areas could still need protection, the trees could need support to establish new self-sustaining populations, and the presence of tribal cultural monitors and a trained arborist may be encouraged (FII CPI, pers. comm. 2024b). More research is needed on assisted migration for western Joshua tree, which is addressed in Action R&I 1.12, "Investigate Assisted Migration."



Ongoing research and field experiences by public agencies, Tribes, NGOs, and academic institutions will continue to improve the information for western Joshua tree conservation. The Conservation Plan will be reviewed every 2 years, at which time, new information relevant to the Conservation Plan's goals, management actions, and effectiveness criteria will be incorporated to maintain the standard of applying science including TEK to decision-making. If relevant science is published or new information is available in the middle of an update cycle, updated management approaches may be implemented before the next update of the Conservation Plan, at the discretion and recommendation of CDFW.

5.2 MANAGEMENT ACTIONS NECESSARY TO CONSERVE WESTERN JOSHUA TREE

To achieve the Conservation Plan vision, purpose, and objectives described in Section 1.2,

"Conservation Plan Vision, Purpose, and Objectives," five major categories of management actions have been identified: avoidance and minimization, land conservation and management, tribal co-management, research to inform long-term conservation, and education and awareness (Table

5-1). Specific management actions within each of these categories are discussed in more detail below. In addition, Appendix D, "Avoidance and Minimization Best Management Practices and Guidelines" provides detailed guidance for implementing management actions that avoid or minimize adverse impacts on western Joshua tree.

"Our task must be to free ourselves...by widening our circle of compassion to embrace all living creatures and the whole of nature and its beauty"
-Albert Einstein

Table 5-1 Management Actions

Management Action Title	Management Action Topic
A&M: Avoidance and Minimization	Avoidance and minimization to lessen negative effects of human activities.
LC&M: Land Conservation and Management	Land conservation and management to protect existing populations and increase abundance.
TCM: Tribal Co-Management	Tribal co-management that reflects California Native American tribes' interests and priorities, improves decision-making, protects existing populations, and increases abundance.
R&I: Research to Inform Long-Term Conservation	Research to inform long-term conservation and improve decision-making.
E&A: Education and Awareness	Education and awareness to increase public support and lessen the negative effects of human activities.



5.2.1 Impact Avoidance and Minimization

The first priority for conservation of western Joshua tree and its habitat is to avoid adverse impacts altogether. Although climate change stress may be impossible to avoid in the short-term, other impacts are avoidable, such as project-related degradation and destruction of habitat. Impact avoidance should be emphasized as the first preferred choice whenever feasible, especially in areas identified as climate refugia. Furthermore, the importance of avoiding take to western Joshua tree and its habitat has been emphasized during discussions with Tribes, in particular the principle of not harming a tree unless it is absolutely critical for people (FII CPI, pers comm., 2024b).

When complete avoidance cannot be achieved, efforts should be made to minimize impacts on western Joshua tree and its habitat, and the presence of tribal cultural monitors and a trained arborist to minimize these impacts are encouraged (FII CPI, pers. comm., 2024a). Minimization may include efforts to reduce the number of trees and seeds taken; the area of habitat that is lost or degraded; the severity of impacts on individual trees; impacts on other organisms on which western Joshua tree depends; and indirect impacts on trees, seeds, habitats, [revegetation and restoration of habitat](#), and other ecologically related organisms.

The avoidance and minimization actions in this section could be voluntarily adopted and implemented by project proponents and land managers, incorporated into project approvals by local governments and regulatory agencies, or incorporated into voluntary, cooperative agreements between relevant agencies, organizations, and other parties. The Western Joshua Tree Conservation Act (WJTCA) requires the avoidance and minimization of impacts on western Joshua tree to the maximum extent practicable as a condition of obtaining a WJTCA incidental take permit (ITP) (Fish & G. Code, § 1927.3, subd. (a)(2)). WJTCA also states that the Conservation Plan shall include guidance for the avoidance and minimization of impacts on western Joshua trees and protocols for the successful relocation of western Joshua trees (Fish & G. Code, § 1927.6, subd. (a)).

The impact avoidance and minimization (A&M) management actions listed in this chapter are intended to promote the survival of existing western Joshua trees and the protection of their habitat where they could potentially be harmed by development, human activities, and natural hazards. Impacts on western Joshua trees could occur from urban development, infrastructure construction, resource extraction, damage by people and vehicles, and other forms of landscape alteration (see Section 4.3). When these activities affect the root systems or the seedbanks of western Joshua tree, the survival of populations can be compromised.



MANAGEMENT ACTION A&M 1: AVOID DIRECT AND INDIRECT IMPACTS

When landscape-altering projects occur near western Joshua trees, avoidance buffers should be established to avoid direct impacts on aboveground and belowground western Joshua tree parts and their seedbank. Scientific information on western Joshua tree root ball width, root zone width, and seedbank width was used to inform direct impact avoidance buffers. Direct impact buffers for avoidance should apply to ground-disturbing activities, such as construction and resource extraction, fire control and suppression, and any other actions that could harm or kill western Joshua trees or seeds. The following actions provide activity-specific guidance for direct impact avoidance.

Action A&M 1.1: Retain Healthy Trees

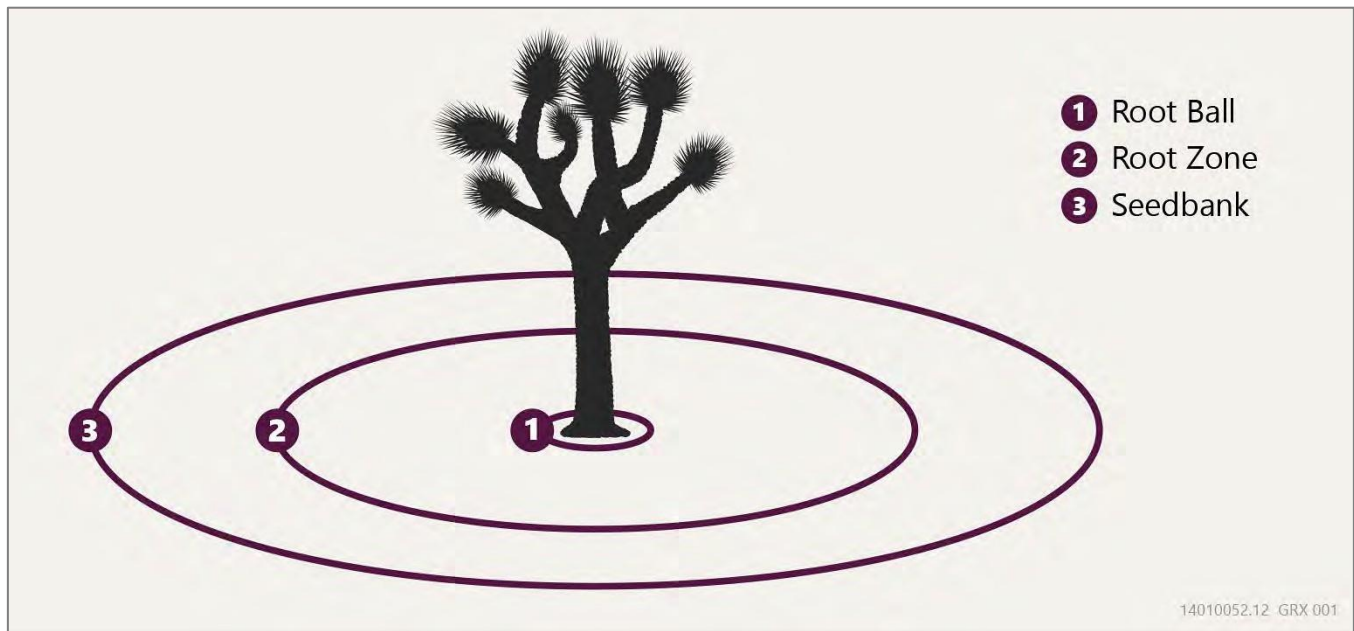
Project proponents (e.g., private and public entities) or agencies (e.g., local, state, and federal agencies) should prioritize retaining healthy western Joshua trees in place when planning a project. Mature/reproductive western Joshua trees in good condition, western Joshua trees in areas within and adjacent to contiguous suitable habitat, and western Joshua trees in habitat that is prioritized as having high value for conservation should be prioritized for retention in place. Signs a tree is healthy may include 60 percent or more living branches, minimal pest damage, recent unrestricted hard growth, recent flowering, and strong tree vigor (see Appendix E, “Relocation Guidelines and Protocols”).

Action A&M 1.2: Implement Avoidance Buffers

When activities occur in the vicinity of western Joshua trees, project proponents, land managers, and agencies should implement buffers around western Joshua trees to avoid direct impacts (see Figure 5-1). In accordance with western Joshua tree primary seed dispersal distances, root growth, and salvage techniques, CDFW recommends buffers to avoid impacts for certain activities. The recommended minimum buffers for ground disturbance are:

- 56.7 meters (186 feet) from the base of a mature (i.e., sexually reproductive) western Joshua tree to avoid impacts on the primary seed dispersal zone,
- 15 meters (50 feet) from the base of a western Joshua tree 1 meter or greater in height or 7.5 meters (25 feet) from a western Joshua tree less than 1 meter (3.3 feet) in height to avoid damage to the root zone, and
- 0.61 meters (2 feet) from the base of a western Joshua tree 1 meter or greater in height or 0.3 meters (1 foot) less than 1 meter (3.3 feet) in height to avoid impacts on the root ball (i.e., the mass of soil that contains concentrated roots growing from the base of the stem of a western Joshua tree).





Note: Graphical representation of buffer zones (not to scale).

Source: Compiled by Ascent in 2024.

Figure 5-1 Western Joshua Tree Buffer Zones

These recommended buffers may be adjusted based on project-specific information and impacts. Additional information to consider when determining a buffer may include, but is not limited to:

- Density of trees within each project site as provided by the project census or other biological survey information.
- Location of a tree in relation to existing structures, such as fences, driveways, or other permanent structures.
- Intensity of proposed ground-disturbing activities (e.g., trenching and excavation impacts may be different than installing fencing).
- Duration of proposed impacts (temporary or permanent).
- Additional minimization measures to reduce impacts of buffer encroachment (e.g., supplemental watering, protecting roots and trees from access, or avoiding equipment damage, etc.).
- Geographic location (e.g., Is the project located in an urban area or within targeted climate refugia?).
- Life stage of tree, including reproductive stage. Branched trees are more likely to have produced seed and may have more extensive root structures.



Disturbances outside of these buffers are less likely to negatively affect the health and survival of the tree or its seeds. CDFW will continue to review the science including TEK on western Joshua tree during implementation of the Conservation Plan and update impact avoidance buffers as appropriate.

Action A&M 1.3: Avoid Impacts during Pesticide Application

Project proponents, landowners, land managers, and agencies should not apply pesticides on western Joshua trees and should implement best management practices that avoid pesticide drift onto western Joshua trees, nontarget native vegetation (e.g., nurse plants), pollinators, and seed-dispersing rodents. See Action A&M 1.3.1, "Avoid Impacts during Pesticide Application" in Appendix D for recommended best management practices related to this Action.

Action A&M 1.4: Avoid Impacts Related to Unauthorized Vehicle Use

Land managers should implement measures to prohibit unauthorized off-highway vehicle (OHV) and other vehicle use off designated trails in western Joshua tree habitat, such as by closing areas outside of designated routes with signage, vertical mulching, or installing other barriers. On public lands authorized for open, overland OHV recreation within western Joshua tree habitat, vehicle use rules should be modified to restrict travel to existing designated trails.

Action A&M 1.5: Avoid Impacts from Overgrazing

Land managers and regulatory agencies should prohibit grazing activities within western Joshua tree habitat if grazing is causing adverse effects. This can be accomplished by not renewing existing grazing leases, excluding portions of allotments with western Joshua trees, and installing property fences to avoid free range or trespass grazing. Feral, nonnative grazing animals (e.g., burros, horses) should be removed or relocated from western Joshua tree habitat. However, targeted grazing by prescribed herbivory may be useful to reduce annual invasive species (see Action A&M 2.7, "Minimize Impacts from Grazing Activities," and Appendix D, Action A&M 3.5.1, "Implement Fuel Treatments") (Berryman et al. 2023).

MANAGEMENT ACTION A&M 2: MINIMIZE DIRECT AND INDIRECT IMPACTS

If avoidance is not feasible, direct and indirect impacts on western Joshua tree and its habitat should be minimized. When landscape-altering projects occur near western Joshua trees, effort should be made to minimize direct impacts on western Joshua tree. The following actions provide activity-specific guidance for direct impact minimization.

Action A&M 2.1: Minimize Impacts from Climate Change

Climate change is a significant threat to western Joshua tree. All entities, including governments, businesses, and individuals should reduce greenhouse gas emissions to help minimize the impacts of climate change on species (IPCC 2023).



Action A&M 2.2: Minimize Impacts on Occupied Western Joshua Tree Habitat

Landowners, developers, and land managers should minimize the area of western Joshua tree habitat that is directly affected by their activities, and minimize the number of trees that are taken or harmed. Minimization of habitat disturbance should include minimizing impacts on areas with nurse plants and minimizing disruption of the movements of small mammal seed dispersers (e.g., not using rodent barrier fencing). Western Joshua tree habitat that is in good condition, in ecologically core or intact areas, and within predicted climate refugia should be prioritized first for avoidance and conservation, but if this avoidance is not feasible, impacts on these areas should be minimized to the maximum extent possible. The importance of minimizing harm to western Joshua trees and their habitat has been emphasized during discussions with Tribes. It is important for trained tribal cultural monitors to be present during destruction or removal of western Joshua trees to provide cultural protection of trees and respect ancestral lands (FIICPI, pers. comm., 2024b).



Action A&M 2.3: Relocate Trees

Western Joshua trees should be relocated when project proponents, landowners, developers, and land managers are unable to retain trees in place or when there is a high probability of substantially damaging or lethal impacts occurring to a retained tree. Project proponents, landowners, land managers, and agencies should follow the Western Joshua Tree Relocation Guidelines and Protocols provided by CDFW (presented in Appendix E) when determining whether a tree should be relocated or not. Appendix E also provides a detailed protocol for conducting tree relocations, including recommendations for selecting relocation areas,



consideration of maintaining genetic integrity of healthy receiver western Joshua tree populations, methods for physically relocating the tree, types of relocation, and maintenance and monitoring standards. It is important for trained tribal cultural monitors to be present during transplantation of western Joshua trees to provide cultural protection of trees and ensure proper removal methods are followed (FII CPI pers comm 2024b). Relocation may not be required when the number of trees to be relocated is so large that revegetation and/or restoration of habitat is more feasible and practicable than relocation.

Action A&M 2.4: Collect and Store Seeds

Collection and long-term storage of viable western Joshua tree seeds can preserve local genetic diversity and therefore can help minimize the loss of western Joshua tree diversity from project activities. In addition, seeds kept in long-term conservation storage can provide source material for restoration of existing habitat or outplanting to other viable locations (such as climate refugia) and can be used to inform conservation, including targeting locations for conservation nurseries. Seed collection and storage activities should follow Center for Plant Conservation's *CPC Best Conservation Practices to Support Species Survival in the Wild* (CPC 2019) or other accepted standards, and seed collection and storage may be a required minimization measure in western Joshua tree incidental take permits issued by CDFW. CDFW may provide additional specific guidelines and methods for using western Joshua tree seed collection as a minimization measure in the future and update recommendations in the Conservation Plan if necessary.

Action A&M 2.5: Minimize Impacts from Invasive Plants

Project proponents, landowners, land managers, and agencies should implement best management practices to prevent the spread of invasive plants (Cal-IPC 2012) for all activities that have the potential to spread invasive species in western Joshua tree habitat. These activities include but are not limited to construction, resource extraction, OHV use, outdoor recreation, fire control and suppression, fuel treatment implementation, and grazing. See Appendix D, Action A&M 2.5.1, "Minimize Impacts from Invasive Plants" for best management practices.

Action A&M 2.6: Minimize Impacts during Pesticide Application

Project proponents, landowners, land managers, and agencies should implement best management practices that minimize pesticide drift or other inadvertent contact affecting western Joshua trees and other nontarget native vegetation (e.g., nurse plants) (see Appendix D, Action A&M 2.6.1, "Minimize Impacts during Pesticide Application").

Action A&M 2.7: Minimize Impacts from Grazing Activities

When grazing is adversely affecting western Joshua tree, landowners, land managers, and



grazing practitioners should decrease grazing intensity when complete avoidance is not feasible (see Action A&M 1.5, “Avoid Impacts from Overgrazing”). Guidance to minimize the



impact of grazing can include implementing rotational grazing, lowering stocking rates and the allowable annual forage utilization rate, implementing short grazing periods for herds and long post-recovery (i.e., rest) periods, and retaining sufficient litter and plant cover to protect the soil from erosion and allow plant regrowth. In areas where western Joshua trees are recovering from wildland fire, grazing should be suspended to allow resprouts and seedlings to establish (See Appendix D, Action A&M 3.3.1, “Minimize Impacts from Postfire Rehabilitation”). In addition, incompatible land uses, such as livestock grazing, should be addressed through the restoration design (see Action L&M 4.3, “Develop and Implement Restoration/Enhancement Plans”). Land managers and project proponents should consult with CDFW prior to implementing prescribed grazing to ensure potential impacts including but not limited to disease transfer to special-status species, including bighorn sheep, are avoided.

Action A&M 2.8: Minimize Impacts from OHV Use and Outdoor Recreation

On public lands where OHV recreation is allowed, land managers should restrict OHV use to designated roads and trails. If new trails are developed, they should avoid western Joshua tree populations. Land managers should encourage responsible OHV use behaviors through continued implementation of education programs to minimize damage to western Joshua tree root systems, nurse plants, and seedbanks. Education programs should emphasize practice and principles for responsible outdoor recreation, such as those provided by Tread Lightly (Tread Lightly 2024) and other organizations.

Action A&M 2.9: Revegetation and Restoration of Habitat

Where avoidance and relocation are not feasible (for example, when there are an extensive number of trees), revegetation and/or restoration of habitat can be utilized to minimize impacts. Revegetation and/or restoration undertaken pursuant to an existing statutory scheme requiring success criteria, monitoring, and financial assurances to ensure completion of the revegetation and/or restoration can satisfy this management action.

MANAGEMENT ACTION A&M 3: MINIMIZE IMPACTS FROM WILDLAND FIRE AND FIRE MANAGEMENT

Wildland fire is a significant threat to western Joshua tree, but efforts to reduce wildland fire risks, fight active wildland fires, and restore landscapes after fires can also damage western Joshua trees and their habitat. This management action includes activities to minimize impacts on western Joshua tree from wildland fire, and from fire risk reduction, suppression, and postfire restoration activities. Wildland fire is unpredictable; however, planned activities for responding to wildland fire events can effectively minimize impacts on western Joshua tree habitat.

Action A&M 3.1: Fight Active Wildland Fires

Land managers and wildland fire responders should aggressively fight and contain active



wildland fires in or near western Joshua tree habitat to protect the habitat, minimize loss of western Joshua trees, and sustain western Joshua tree habitat values.



Action A&M 3.2: Minimize Impacts from Fire Suppression



Bulldozer, firefighter, and fire engine conducting fire suppression efforts on the Elk Fire in 2024

Source: Hannah Schwalbe, National Park Service.

To minimize impacts on western Joshua trees and their habitats caused by wildland fire suppression response, when it does not threaten the safety of firefighters, the public, or important infrastructure, land managers and wildland fire responders should minimize direct and indirect tree damage or removal, ground disturbance in western Joshua tree habitat, and degradation of habitat values from fire suppression and control activities. Minimum Impact Suppression Techniques (MIST) and best management practices are provided in Appendix D, Action A&M 3.2.1,

"Minimize Impacts from Fire Suppression." Examples of best practices for wildland fire response include using preexisting fuel breaks as fire lines and stopping all habitat-damaging tactics as soon as they are no longer required.

Action A&M 3.3: Minimize Impacts from Postfire Rehabilitation

Land managers should minimize direct impacts on western Joshua trees after a wildland fire by developing and implementing measures when rehabilitating burned areas. A postfire monitoring plan should include measures to protect existing western Joshua trees, replant western Joshua trees using appropriate seed sources if they no longer exist, replant other native species, control invasive plants, and protect exposed soil as part of plans for landscape revegetation. Appendix D, Action A&M 3.3.1, "Minimize Impacts from Postfire Rehabilitation" contains specific elements to include in a postfire monitoring and control plan.

Action A&M 3.4: Minimize Accidental Ignition of Fires

Best management practices should reduce the potential for accidental ignition of wildland fires and be implemented during construction, outdoor recreation activities, operation and maintenance of infrastructure, and other activities involving overland use of motorized vehicles or mechanical equipment. Fire extinguishers, backpack sprayers, water trailers, or water tenders equipped with hoses should be available to suppress accidental ignitions during hot, dry, or windy conditions. To reduce the potential sources of ignition that may accidentally burn vegetation, best management practices should be implemented as described in Appendix D, Action A&M 3.4.1, "Minimize Accidental Ignition of Fires."



Action A&M 3.5: Implement Fuel Treatments

Fuel treatments in the vicinity of western Joshua trees could be conducted when appropriate, such as when high fuel loads are present (e.g., invasive plants) or when an area has burned more frequently than the natural fire return interval.

Land managers should develop and implement measures to avoid and minimize direct impacts on western Joshua trees during fuel treatment for wildland fire risk reduction. Several types of fuel treatments that could be implemented in western Joshua tree habitat include fuel breaks, treatments in the wildland-urban interface, and treatments focused on removing invasive species and restoring areas to the natural fire regime (i.e., ecological restoration). Fuel breaks (areas cleared of vegetation or graded as a fuel treatment in anticipation of a fire) have been found to be ineffective at containing wildland fire under certain circumstances, for example high winds (Syphard et al. 2011; Oliveira et al. 2016), but they are useful for firefighter access (Syphard et al. 2011). Treatments in the wildland-urban interface “consist of strategic removal of vegetation to prevent or slow the spread of non-wind driven wildland fire between structures and wildlands, and vice versa” (California Board of Forestry and Fire Protection 2019). Fuel treatments designed for ecological restoration are intended to restore “degraded, damaged, or destroyed ecosystems and habitats to conditions associated with a natural fire regime” and may be implemented in areas where invasive species such as red brome (*Bromus rubens*), cheatgrass (*Bromus tectorum*), Sahara mustard (*Brassica tournefortii*), stinknet (*Oncosiphon pilulifer*), Russian-thistle (*Salsola tragus*), or red-stemmed filaree (*Erodium cicutarium*) or dead, woody debris have increased in cover and have resulted in a shift in the fire regime (Brooks and Minnich 2018; Cal-IPC 2024). Additional guidance to avoid and minimize impacts on western Joshua tree and its habitat during fuel treatments can be found in Appendix D, Action A&M 3.5.1 “Implement Fuel Treatments.”

5.2.2 Land Conservation and Management

With climate change as a primary threat to western Joshua tree, protecting and managing lands that are occupied by the species and predicted to be climate refugia are high priorities for conserving the species. Managing climate change refugia and maintaining ecological functions necessary for western Joshua tree survival also allows time for natural systems to adapt and for humans to develop longer-term solutions for conservation (Peterson et al. 2011).

The goal of land conservation is to permanently protect western Joshua tree habitat from development and other incompatible human uses. Conserving lands before habitat degradation and destruction occur is a critical first step toward ensuring the land remains occupied by and suitable for western Joshua tree in the future.



The goal of land management is to create and maintain environmental conditions on conserved land that promote viable populations of western Joshua trees and their habitat. The threats from climate change, wildland fire, invasive species, and other human activities may still be present after land is permanently protected from development. Land management will be necessary to avoid, minimize, and remediate these threats on a long-term basis to ensure that conserved lands continue to support sustained populations of western Joshua trees and the natural processes on which they depend.

Land conservation and management actions have been developed with principles of conservation biology in mind and will be a critical component in achieving the goals of the Conservation Plan.

MANAGEMENT ACTION LC&M 1: IDENTIFY PRIORITY CONSERVATION LANDS

With finite resources available for conservation efforts, CDFW will define criteria for prioritizing lands that are most suited to the persistence of western Joshua tree. The criteria will help guide agencies, NGOs, Tribes, and others in protecting conservation land. Smith et al. (2023) suggest that western Joshua tree conservation efforts focus on protecting populations that meet criteria for resiliency to climate change and that have demographic signatures of long-term viability. Protecting lands that are already occupied by western Joshua tree should also be prioritized because establishing populations of western Joshua tree in new areas is extremely challenging, sometimes controversial, and costly with a high risk of failure.

Smith et al. (2023) recommend the following four steps (which are summarized further in Section 5.1 under the seven-step approach to conservation) for identifying locations within western Joshua tree populations that should have highest priority for protection:

1. Identify genetic structure and distinct populations.
2. Develop species distribution models for these populations using high-quality occurrence data to identify climate refugia.
3. Validate potential refugia using demographic studies and other independent data sources.
4. Assess adaptive genetic variation within populations, using either association genetics or, ideally, experimental approaches coupled with genomic data.

Detailed information on the genetic structure, distinct populations, and the adaptive genetic variation of western Joshua tree is not currently known. A species distribution model for western Joshua tree using high-quality occurrence data was developed by Esque et al. (2023) and has been applied to a model developed to identify western Joshua tree climate refugia range-



wide (Shryock et al. forthcoming). Categories of climate refugia based on these data (described in Section 4.4, “Management Units”) were used to help identify priority conservation lands. Detailed range-wide data from western Joshua tree demographic studies to validate potential refugia are not yet available but will be incorporated into the Conservation Plan in the future.

The intactness of ecosystems is an important predictor of ecosystem function and overall conservation value. Ecosystems that are more intact are better equipped to support western Joshua tree habitat functions and are essential for maintaining the species in the future. Parker et al. (2018) updated the ecological assessment conducted by Randall et al. (2010) and assessed the conservation value of areas that overlap western Joshua tree’s range as part of an assessment of the impacts of solar and wind development in two locations in California. This assessment was conducted on a coarse scale—2.59 square kilometers (1 square mile) hexagons—based on 2017 conditions. Parker et al. (2018) assigned each hexagon one of the following four conservation values (in order of decreasing value) from the Randall et al. (2010) framework: ecologically core, ecologically intact, moderately degraded, and highly converted.



Young western Joshua trees growing at high elevation of 5,817 feet

Source: Michael Faist, National Park Service.



As a range-wide strategy, CDFW will apply conservation priority to the areas identified as climate refugia (comprising categories of predicted and buffered climate refugia, and unoccupied future suitable habitat; see Section 4.4) or assigned conservation values of ecologically core or intact, recognizing they will be the areas most valuable for western Joshua tree in the future. Areas of climate refugia that are moderately degraded may also be valuable for western Joshua tree in the future. Additional information on climate refugia and ecological intactness is in Section 4.4.

On a local scale, CDFW will identify priority conservation lands based on the best available site data relevant to western Joshua tree's ecological needs for long-term viability. Available information will be analyzed initially, and additional information will be collected to properly assess the relative conservation value of the evaluated lands.

Synthesizing the characteristics of land with the highest conservation value for western Joshua tree, priority conservation lands should possess all or at least some of the following attributes:

- A large area occupied by western Joshua tree.
- A high density of reproductive adult individuals.
- Presence within predicted climate refugia.
- A high recruitment rate.
- Presence of pollinator moths, nurse plants, and small mammal seed dispersers.
- Low risk of stressors from adjacent land use (e.g., fire ignition risk, invasive species encroachment, OHV-related damage, planned development; disturbance from high-traffic roads).
- High-value lands that currently have little to no protection.
- Good overall tree health within populations (e.g., few signs of pests, damage, exposed roots, or health problems; higher vigor; trees and limbs upright).
- Large patch size (low perimeter-to-edge ratio) and connectivity to other areas occupied by western Joshua tree.
- Connectivity to climate refugia, such as landscape connections across elevation gradients and ecological transition zones (e.g., where desert communities transition to montane communities of the Sierra Nevada and Transverse ranges [Randall et al. 2010] and between the Mojave Desert and Great Basin).
- Genetically distinct populations with adaptive genetic diversity.



A weighted scoring system is useful for evaluating and prioritizing potential conservation lands. CDFW has used the preliminary lands assessment criteria (presented in Appendix F, “Conservation Lands Prioritization Assessment”) as an initial tool to help focus Conservation Fund expenditures on the acquisition and protection of lands with the greatest western Joshua tree conservation value. CDFW will update or revise this tool as needed in the future based on new information and data.

MANAGEMENT ACTION LC&M 2: PROTECT PRIORITY CONSERVATION LANDS

CDFW will apply a multifaceted approach to safeguard conservation lands supporting western Joshua trees on a local scale and within predicted climate refugia range-wide. Protection of areas identified as priority conservation lands is particularly important to achieve the goals of this Conservation Plan, but any lands supporting western Joshua tree may contribute to the conservation of the species. Strategies for land conservation may include designations by state, federal, local, and tribal governments (e.g., designated parks, preserves, monuments, conservation areas, and wilderness areas); protection of lands for conservation by NGOs; acquisition of fee title or conservation easement; and implementation of interagency agreements or written memoranda of understanding (MOUs). Durable legal protection mechanisms are described further in Chapter 6, “Implementation.”

Action LC&M 2.1: Implement Priority Conservation Land Protection

Lands identified through Management Action LC&M 1, “Identify Priority Conservation Lands,” as high priority for western Joshua tree conservation could be protected through the following implementation approaches:

- Establishment of a State Parks Natural Reserve or Natural Preserve within a State Park or State Recreation Area, CDFW Ecological Reserve, and conserved land under state conservancies or Resource Conservation District land protection programs.
- Purchase or lease of State School Lands from the California State Lands Commission for western Joshua tree conservation purposes.
- Conservation of other state lands through written MOUs or other collaboration agreements with CDFW.
- Designation of national monuments, federal conservation areas, wilderness areas, national parks, and other federal protections.
- Conservation of other federal lands through interagency agreements or written memoranda of understanding and other mechanisms in coordination with US Fish and Wildlife Service (USFWS) (see example agreements in Section 2.2.2, “Federal Listing Status”).



- Acquisition of land by governments, Tribes, or NGOs from willing sellers through fee title or conservation easement acquisition.
- Establishment of conservation easements cooperatively by landowners.
- Written MOUs for conservation on tribal land.
- Establishment and protection of public open space, parks, or/and preserves by local agencies.

Action LC&M 2.2: Track Progress of Conserved Lands

Regardless of the land protection approaches used, a central tracking system for conserved lands should be maintained by CDFW to track progress in protecting priority conservation lands. The system should use a geographic information system to document locations of protected lands in relation to western Joshua tree's distribution and priority conservation lands identified under Management Action LC&M 1, "Identify Priority Conservation Lands."

MANAGEMENT ACTION LC&M 3: MANAGE CONSERVATION LANDS

Long-term management of conservation lands should be carried out to support western Joshua tree populations and habitat. Land management activities, such as invasive species control, fuel break maintenance, fence repair, garbage removal, monitoring and adaptive management, and law enforcement, are often required to avoid, minimize, and remediate ongoing and persistent threats. Land management is particularly important for priority conservation lands at high risk from wildland fire, invasive species, ongoing and adjacent land use, and illegal or trespass activities. Land management is an important action for maintaining the natural processes western Joshua tree needs in its habitat. TEK would help define beneficial land management practices for western Joshua tree, as discussed in Section 5.2.3, below.



Source: Anna Cirimele, National Park Service.



Management of federal and state lands is typically the responsibility of an agency, with resources allocated based on the budget and priorities of the agency in compliance with its laws and regulations. Although some agencies allocate resources with biodiversity conservation in mind, land use policies or mandates may conflict with conservation priorities and can negatively affect biodiversity. Even if conservation is a priority, agency resources may be limited to implement land management for the benefit of western Joshua tree.

Action LC&M 3.1: Develop Long-Term Plan for Conservation Lands

Landowners, land managers, and agencies should develop management and long-term monitoring plans to promote long-term persistence of western Joshua tree on conservation lands. These plans should describe how the land will be managed to maintain habitat function and minimize or remediate threats to western Joshua tree. CDFW will work with land managers to develop long-term monitoring and management plans or conservation easement stewardship agreements for conserved lands.

Land management plans should be tailored to the needs of individual properties based on site evaluations. Management priorities may include invasive species control, wildland fire risk reduction, cultural burning, restoring degraded areas, and measures to reduce threats from adjacent land uses or to prevent trespassing and unauthorized uses. Monitoring for adaptive management should be incorporated into plans to track the condition of western Joshua trees and other habitat characteristics. Management actions or alternative management approaches should then be implemented, if necessary, based on monitoring results.

Management should emphasize protecting priority conservation lands from wildland fire where fire risk to western Joshua tree populations is high. Maintenance of existing fuel breaks and establishment of new low-impact fuel breaks may be effective approaches to protecting western Joshua tree populations from wildland fire damage. Existing roads and other infrastructure should be maintained as fuel breaks to the extent feasible and effective.

Action LC&M 3.2: Prioritize Management of State and Federal Lands for Western Joshua Tree

Approximately 2 and 63 percent of the western Joshua tree range in California are on state and federal lands, respectively. Therefore, CDFW will seek to establish written MOUs or other written agreements with state and federal agencies for long-term monitoring and management to benefit western Joshua tree on priority conservation lands. Approximately 28 percent of these lands are within predicted climate refugia, which increases the importance of managing these lands to conserve western Joshua tree.



Action LC&M 3.3: Establish Endowments and Provide Other Long-Term Funding Mechanisms for Management of Conservation Lands

Funding for long-term land management is necessary to ensure that critical monitoring and management activities of conservation lands are implemented. Funding may be provided with endowments, annual budgets, grants, use of the Conservation Fund, or other mechanisms applicable to the land management agency, organization, or California Native American tribe.

MANAGEMENT ACTION LC&M 4: RESTORE AND ENHANCE HABITAT

Restoration of damaged or degraded lands and enhancement of lands to help support western Joshua tree can aid in the conservation of the species. Given that desert ecosystems are slow to recover after disturbance, active restoration can be a valuable tool for increasing ecosystem recovery and improving habitat suitability for western Joshua tree (Abella et al. 2023).

Habitat restoration is the holistic process of reestablishing ecological function and repairing characteristics of a site to return it to a condition that is self-sustaining. Realizing self-sustaining habitat may be achieved under the care of Tribes and/or by aiming to re-create conditions that existed before it was damaged or degraded by natural or human disturbances post-colonization. Restoration actions may include reconstructing natural topography or other physical characteristics of the land, rehabilitating compacted soils, removing invasive plants, and replanting native vegetation. Examples of habitat restoration include replanting western Joshua trees and associated native plants on a site where these species were destroyed by wildland fire and reestablishing natural topography where OHV use created rills and gullies (Abella et al. 2023). In some circumstances, restoring moderately or highly degraded lands occupied by western Joshua tree can provide conservation value for the species overall. Restoration is especially valuable where ecologically core or ecologically intact lands are not available, or where degraded or converted lands are within or connected to predicted climate refugia.

Habitat enhancement involves the modification of certain characteristics of a site with the goal of increasing specific habitat functions based on management objectives, such as increasing habitat suitability for a particular species (Vaughn et al. 2010). An example of habitat enhancement is vertical mulching a site occupied by western Joshua tree that is lacking sufficient nurse plants to support western Joshua tree recruitment. Another example is implementing projects that use science-based, assisted gene flow methods to introduce climate-adapted genes into stands of western Joshua trees to enhance their capacity for climate adaptation and resilience, provided there is sufficient scientific justification to do so. Habitat enhancement may be appropriate on some ecologically core or ecologically intact conservation lands, such as those that are within predicted climate refugia. Enhancement may also be beneficial on sites that support populations with advantageous genetic traits,



such as climate resilience adaptations, to increase seed production or recruitment within those populations.

Land managers should use a comprehensive restoration approach to return ecosystem functions to degraded sites, or to enhance a site's resilience, ecological function, and ability to recruit western Joshua trees. Where appropriate, funds from the Western Joshua Tree Conservation Fund could be used for restoration efforts on strategically located habitats that have been degraded by fire, invasive plants, development, grazing, unauthorized OHV use, or other disturbances.

Action LC&M 4.1 Identify Priority Restoration Areas

Western Joshua tree habitat of high conservation value that is damaged by wildland fire or other stressors should have priority for restoration. Habitat of high conservation value includes sites within or connected to predicted climate refugia and other priority conservation areas as determined through implementation of Management Action LC&M 1, "Identify Priority Conservation Lands." Other priority restoration sites should be selected based on predicted climate refugia areas where research indicates climate-adapted individuals are already found growing. Other factors to consider when evaluating lands for restoration potential include adjacent land uses, western Joshua tree cover and demography, seed sources or presence of a seedbank, soil condition, absence of invasive plant infestation, condition of topsoil, presence of biotic soil crusts, and availability of nurse plants.

Action LC&M 4.2 Identify Priority Enhancement Areas

Enhancement should be implemented to improve ecosystem processes on sites already occupied by western Joshua tree to increase recruitment and population resilience. Enhancement projects would be focused on relatively undisturbed areas to ecologically improve western Joshua tree habitats on priority conservation lands. Enhancement activities should be focused on sites that are situated in predicted climate refugia or other priority conservation areas where natural processes or habitat functions could be improved for a specific conservation objective, and where enhancement projects will clearly result in an overall net improvement in ecosystem processes for western Joshua tree and its habitat. The following are examples of enhancement for conservation objectives:

- Assist the natural regeneration of western Joshua trees and nurse plants.
- Introduce climate-adapted genes in populations through assisted gene flow methods, such as translocating individuals and outplanting nursery stock.
- Irrigate during drought periods.
- Improve regeneration by introducing yucca moth pollinators.



Action LC&M 4.3: Develop and Implement Restoration/Enhancement Plans

Once a site is identified for a restoration or enhancement project, a detailed design plan for implementing the project should be developed. The design plan should incorporate clear, explicit, and measurable goals based on current baseline potential and site conditions before disturbance. The design plan should include a summary of the site's existing habitat conditions, a description of habitat features required for western Joshua tree persistence, quantitative metrics to define goals and measure success, a monitoring and management plan, an undisturbed reference site to compare with the restoration or enhancement site to help evaluate success, an estimate of the project's cost, and review of the design plan by a qualified desert restoration specialist.



Joshua tree habitat restoration site managed by Mojave Desert Land Trust.

Source: Jessie Quinn, Ascent

The steps to implementing enhancement activities should be site specific depending on management goals; however, any potential restoration action on a disturbed site could likely be implemented on a relatively undisturbed site to improve natural processes, habitat functions, or climate resiliency for western Joshua tree.

Typical restoration or enhancement goals for western Joshua tree habitat include increasing western Joshua tree recruitment; increasing cover of native plant species, especially native shrubs; reducing competition from invasive annual plant cover; and stabilizing and repairing soils including soil microbiomes (biocrusts). Typical challenges to achieving restoration or enhancement goals in desert ecosystems include low and unpredictable precipitation; hot, dry summers; infertile, shallow, or damaged soils; intensive herbivory when other forage plants are limited; limited availability of plant resources for revegetating restoration sites; and competition from invasive plants (Abella et al. 2023). The restoration or enhancement design plan should identify methods to address these challenges.

Modified and disturbed habitats often have little or no remaining cover of live western Joshua trees and native associate plants and therefore require active planting as an element of restoration. These sites must be revegetated with western Joshua tree and nurse plant species. Depending on the needs of the site, availability of plant and seed sources, and funding availability, revegetation may use a combination of these methods: outplanting appropriate



nursery stock, salvaging and transplanting from other sites, planting cuttings from plants, and seeding. Ideally, this would include planting western Joshua tree seedlings grown from seeds that are collected from individuals genetically adapted to similar site conditions, from the same general geography, and from individuals with climate adaptive traits. Where necessary and feasible for vegetation establishment, all plantings of western Joshua tree and nurse plants should be caged to prevent damage from herbivory, and supplemental irrigation should be provided. Assisted natural regeneration of western Joshua trees and nurse plants may be an appropriate element of restoration to promote their growth and establishment, which might include tree shelters, removal of competing invasive vegetation, and other techniques based on science including TEK.

Disturbed lands often have degraded soils and may require soil rehabilitation before revegetation. Soil conditions should be evaluated before beginning revegetation, and a strategy for improving soil suitability for western Joshua tree establishment should be incorporated into the restoration design plan as necessary. Soil rehabilitation techniques may include decompaction, roughening soil surfaces, replacing topsoil, and inoculating soil with associated beneficial microorganisms (e.g., arbuscular mycorrhizal fungi).

Active restoration of biotic soil crusts (biocrusts) can be an important part of returning degraded sites to conditions favorable for western Joshua tree by limiting soil erosion, increasing soil organic matter and nutrients, facilitating native plant seed germination, and limiting invasive plant establishment. Arbuscular mycorrhizal fungi live in the soil and form mutualistic symbiosis with plant roots that facilitate nutrients to roots, increase drought tolerance by increasing water uptake in roots, and may increase resistance to soil pathogens. As new research improves understanding of biocrust restoration and arbuscular mycorrhizal fungi associations with western Joshua tree, strategies in restoration plans should be updated and refined.

Vertical mulching consists of placing dead plant material upright into the ground to provide vertical structure that replicates some functions provided by nurse plants, such as shading, trapping windblown sand and seeds, and moisture retention. If appropriate for the site, this technique can be implemented to reduce erosion, discourage vehicle or foot traffic, and facilitate the establishment of western Joshua tree and native shrub seedlings (Abella et al. 2023).

Climate change is predicted to make the region hotter for longer periods of the year and increase the occurrence of droughts, variable precipitation, and intensity of heavy precipitation events; therefore, reducing as many other threats and stressors as possible will increase the likelihood of restoration success (Abella et al. 2023). Anything that degrades the habitat value for western Joshua tree, such as invasive plants, incompatible land uses (e.g., livestock grazing, OHV use), erosion, and wildland fire (e.g., fuel breaks around the restoration site) should be addressed through the restoration design. If appropriate and feasible,



restoration sites should be fenced to prevent human activities (e.g., foot traffic, OHV use, cattle grazing, illegal dumping) from influencing restoration success.

Restoration or enhancement activities should include conducting an invasive species assessment of the site, including mapping infestations. Then, if appropriate, invasive species control should be conducted, using targeted herbicides (e.g., indaziflam) or other treatment methods appropriate for target species, early in the growing season before restoration occurs, as well as for maintenance (see Action A&M 2.6, "Minimize Impacts during Pesticide Application").

Yucca moths play a critical role in western Joshua tree reproduction; therefore, introducing yucca moth pollinators to restoration or enhancement sites where they are absent should be considered as part of a restoration or enhancement design plan and incorporated as appropriate to facilitate pollination and contribute to successful regeneration. Ongoing monitoring to track moth survival and reproduction and management to protect moths from threats would be necessary for successful establishment of a self-sustaining yucca moth population.



Source: Anna Cirimele, National Park Service.

Regular maintenance and monitoring are necessary to ensure ecological processes are trending toward meeting the goals described in the design plans. Monitoring allows projects to be adaptively managed if performance standards are not being met along the way. Quantitative performance criteria that trigger adaptive management actions if performance standards are not being met should be incorporated into the maintenance and monitoring plan. Monitoring duration and intervals should be included in the plan. Restoration and enhancement projects should be monitored for long periods of time following completion of the initial restoration or enhancement activities due to the slow nature of desert ecosystem



processes. Monitoring, maintenance, and adaptive management should continue until success criteria are met.

Action LC&M 4.4: Encourage Project-Related Revegetation and Restoration to Minimize and Mitigate Impacts

Project proponents (i.e., private and public entities) should be encouraged to include a revegetation and/or restoration component in their projects, especially when avoidance and relocation are not feasible, to further restore and enhance habitat. Revegetation and/or restoration undertaken pursuant to an existing statutory scheme requiring success criteria, monitoring, and financial assurances to ensure completion of the revegetation and/or restoration can satisfy this management action.

MANAGEMENT ACTION LC&M 5: DEVELOP AND IMPLEMENT A SEED CONSERVATION STRATEGY

While preserving western Joshua tree in the wild is the top priority, developing a seed conservation strategy that includes establishment of seed banks is an important way to minimize loss of western Joshua tree genetic diversity over the long term (see Action A&M 2.4). Seeds collected for long-term conservation storage could be used to grow western Joshua trees for restoration and enhancement projects or research. With sufficient additional research, the conservation seed bank could provide opportunities to assist gene flow to facilitate climate adaptation by planting western Joshua trees in areas of climate refugia.

A comprehensive seed conservation strategy should be implemented to develop a seed repository that is representative of western Joshua tree genetic diversity over a wide geographic area across a range of environmental conditions. The seed strategy should include protocols for seed collection, storage, and distribution for conservation and recovery purposes following the guidelines published in Center for Plant Conservation's *CPC Best Conservation Practices to Support Species Survival in the Wild* (CPC 2019) that will ensure long term preservation of a viable, genetically diverse western Joshua tree population.

Action LC&M 5.1: Develop Seed Collection Standards and Protocols



Western Joshua Tree Conservation Plan

In collaboration with other agencies and institutions, CDFW will develop and adopt standards and protocols for western Joshua tree seed collection strategies to maximize genetic seed diversity. The seed collection standards and protocols will be designed to conserve western Joshua seeds that are adapted to climates expected to persist in the



Joshua tree seed pods.

Source: Anna Cirimele, National Park Service.

future. Collections will include seeds from areas at high risk of wildland fire, areas recently subjected to wildland fire, and areas with hotter, drier microclimates (i.e., seeds from

genetically adaptive individuals). This would likely include collection of seeds during masting years. Seed collection could also be a permit condition for take of western Joshua tree (see Action A&M 2.4). The seed collection standards will be based on the Center for Plant Conservation's *CPC Best Conservation Practices to Support Species Survival in the Wild* (CPC 2019) and will include the following actions:



- Obtain necessary permits from CDFW and permission from the landowner before attempting any collection of western Joshua tree seeds.
- Collect no more than 10 percent of seeds produced within a given western Joshua tree population in any 1 year, or no more than the maximum amount of seeds allowed by CDFW and/or the relevant permitting authority.
- Capture the full genetic diversity of the population by collecting from individuals across the whole site, from as many maternal plants as possible, and from all sizes of seed-producing plants present. Collect seeds over multiple years, if possible, to increase genetic diversity of seeds collected.
- Collect only mature seeds and collect the full diversity of seed morphologies represented in the population.
- Track seed origin, or georeferenced latitude and longitude, of the parent plant from which the seeds were collected. Seed origin is important because genetic material and adaptations of seeds can vary widely between different locations. Offspring from seeds collected in a specific geography may not be genetically adapted for growth under environmental conditions in another location. Therefore, tracking their origin can help identify the geographic range suitable for growing the seed, increasing the odds of successful growth.
- Record accession information for seed collections, such as collector, date, location, habitat and associate species information, population demographics, and number of individuals from which seeds were collected.

Action LC&M 5.2: Develop Seed Storage Standards and Protocols

Stored seed will be important for use in ecological restoration/reforestation projects and assisted gene flow programs. Assisted gene flow programs could be used to enhance climate change resilience by translocating genetically adaptive individuals into western Joshua tree populations that do not currently support individuals with climate change adaptations. Seed viability and germination testing should be conducted prior to being put into storage and then retested for viability at regular intervals and before seeds are used to grow trees. Seeds should be stored following practices that promote high seed quality and increase seed longevity, as discussed in CPC (2019), such as:

- Keep accurate records, including documentation and accession information.
- Clean seeds prior to storage.
- Follow the recommended drying conditions.
- Package seeds from different maternal lines separately.



- Divide collected seeds into two batches and store at separate storage institutions to mitigate loss from natural or human-caused catastrophe.
- Adhere to the appropriate moisture targets to maintain relative humidity during storage.
- Store at the appropriate temperature.
- Monitor storage conditions and seed viability.

Action LC&M 5.3: Develop Nursery Standards and Protocols

Nurseries used to grow seedlings should be qualified and abide by established standards and protocols. When western Joshua tree plants are required for restoration projects or assisted gene flow attempts, viable seeds from the repositories should be grown in a qualified nursery until seedlings have established to a point where they have a greater chance of survival in the wild. Standards should include guidance on plant and seed distribution and tracking, how long juvenile plants should grow in the nursery before they are ready for outplanting, proper soil mixtures, watering schedules, recommended pot sizes, and how seedlings should be transported to identified restoration and outplanting sites. CDFW may develop nursery standards and protocols for western Joshua tree propagation and outplanting and include them in a future Conservation Plan update, if necessary.

5.2.3 Tribal Co-Management

CDFW recognizes that California's Native American tribes have long taken care of California's fish, wildlife, and plants and possess unique and valuable expert knowledge and practices for conserving and using these resources in a sustainable manner. Engaging in co-management is key for western Joshua tree conservation, and it is important to do so in ways that respect the interests and priorities of Tribes. The goal of co-management is to collaboratively share management functions and responsibilities for conservation of western Joshua tree and its habitat. Co-management provides an avenue to improve the conservation strategies by ensuring Tribes have access and pathways to implement their extensive life experience and unique understanding of the landscape. This also ensures their knowledge is incorporated into the Conservation Plan, as appropriate, while acknowledging that the Tribes choose what and how knowledge is shared.



Source: Native American Land Conservancy.



The process to develop meaningful co-management will require time that extends beyond the publishing timeline of the Conservation Plan. TEK shared by Tribes will influence management actions in the Conservation Plan. In turn, this tribal knowledge and guidance will inform specific standards for co-management of the species. The actions in this section describe establishing the framework needed to guide development, incorporation, and implementation of co-management functions and responsibilities.

MANAGEMENT ACTION TCM 1: ESTABLISH CO-MANAGEMENT PRINCIPLES

Collaboratively establishing core principles of co-management is an essential first step toward co-creating written agreements and long-term collaborations between the State and Tribes for western Joshua tree conservation. The goal of developing co-management principles is to guide future decision making and the elements of co-management practices between CDFW and Tribes. These core principles may include expectations and use of vocabulary that signifies the respect, commitment, intent, and responsibilities of multiple sovereign governments and integrate their respective management philosophies into mutually beneficial approaches to achieve a common set of goals. It is important that the co-management principles reflect tribal interests and priorities that complement other actions designed to implement WJTCA and to comply with other California laws. Therefore, development of co-management principles requires time and multiple discussions to achieve an approach and written agreement that works for both CDFW and Tribes. This will warrant ongoing work together after the initial adoption of the Conservation Plan.

After reviewing the Advisory Council on Historic Preservation's Policy Statement on Indigenous Knowledge and Historic Preservation (ACHP 2024), CDFW developed initial foundational commitments, which was requested by tribal members (FII CPI, pers. comm., 2024a). A draft of CDFW's foundational commitments is provided in Appendix G, "Foundational Commitments by CDFW for Developing Western Joshua Tree Conservation Plan Co-Management Principles with California Native American Tribes." The following topic summaries are addressed in the commitments:

- **Respect and relationship building.** Tribal knowledge, including TEK, will be treated with respect in all circumstances.
- **Valid and self-supporting knowledge.** TEK held by a tribe is a valid, sound, and self-supporting source of information and is an aspect of science.
- **Cultural and religious significance of Traditional Ecological Knowledge.** Conservation actions affect resources and properties that may be of religious and cultural significance to tribes.



- **Fair compensation.** If a state agency requests a tribe to provide TEK via research, survey, monitoring, or other efforts, the state agency and the tribe are encouraged to collaborate to identify potential funding mechanisms (which may include grants, to the extent permitted by applicable laws and regulations and sufficient resources) to fairly reimburse or compensate the tribe.
- **Transparency and records of tribal involvement.** Maximum transparency is essential to demonstrate how and what tribal priorities, including TEK and other sensitive information, will be documented in conservation project records.
- **Consultation timelines.** Timelines will reflect the complexity and nature of the undertaking and will recognize and seek to accommodate to the capacity of tribes throughout the decision-making processes.
- **Professional qualifications of tribal representatives.** The State recognizes that representatives of tribes have professional qualifications.
- **Managing and protecting sensitive tribal information.** The State will prevent or limit to the maximum extent feasible any inappropriate disclosure of confidential or sensitive information through all available mechanisms.



Source: Jessie Quinn, Ascent.



MANAGEMENT ACTION TCM 2: MUTUALLY DEFINE ELEMENTS OF CO-MANAGEMENT

Guided by the foundational commitments and co-management principles from Management Action TCM 1, "Establish Co-Management Principles," CDFW and California Native American tribes will co-create elements of the Western Joshua Tree Conservation Plan actions that incorporate tribal values, knowledge, priorities, and co-management on tribal land or other properties that contain resources or lands that may be of religious and cultural significance to Tribes. Mutually defining elements that should be included in co-management agreements to carry out both traditional and contemporary land stewardship practices promote meaningful collaboration and tangible outcomes. The following actions present elements that need to be addressed and agreed upon with Tribes for inclusion as co-managed conservation actions:

- Articulate a process for take of western Joshua tree by California Native American tribes in a culturally appropriate manner or for a specific purpose (FII CPI, pers. comm., 2024a).
- Continue consultation to provide a platform for Tribes to articulate aspects of TEK that include spiritual and cultural elements that may be new to agencies. Agencies should seek to consider these unfamiliar aspects of environmental protection and include them in guidance and policies (FII CPI, pers. comm., 2024b).
- Upon request of a California Native American tribe, collaborate on developing a process to relocate western Joshua trees to tribal lands when there is an opportunity to do so. For example, an opportunity may be related to coordinating with a developer that is openly seeking a pathway for relocating trees they are permitted to take.
- Encourage the presence of tribal cultural monitors at development or other ground-disturbing projects during the salvage, destruction, or removal of western Joshua trees as a measure to provide spiritual and cultural protection to western Joshua trees that are either taken or are affected in the project area. Ideally, tribal cultural monitors may also be trained as arborists working as desert native plant specialists to ensure proper salvaging methods are implemented (FII CPI, pers. comm., 2024b).
- Encourage employment of trained tribal members or local tribal conservation crews to support restoration and relocation efforts of western Joshua trees that are carried out with cultural and biological integrity.
- Collaborate with Tribes to identify where ethnographic studies are requested. Identify needs and potential resources, including but not limited to funding, so Tribes can carry out these studies.
- Identify priority lands of significance to individual California Native American tribes that may overlap with the biological criteria outlined in Management Action LC&M 1 so that they can be prioritized for long-term conservation and tribal stewardship.



- Collaborate and identify initiatives for tribal management of western Joshua trees, for example, supporting nurseries developed and led by California Native American tribes for western Joshua tree conservation.
- Incorporate California Native American tribes' TEK or provide supporting pathways for Tribes to implement TEK into western Joshua tree conservation strategies. For example, Tribes and CDFW will collaborate to incorporate cultural burning where it would be an effective tool (outlined under Management Action LC&M 3) for reduction of wildland fire risk or enhancement of western Joshua tree population conditions on tribal lands (ACTCI, pers. comm., 2024).
- Collaborate and identify all applicable and available sources of funding (including but not limited to the use of the Conservation Fund) to support tribal TEK implementation. Non-tribal parties assuming TEK implementation responsibility without explicit tribal permission would be a breach of intellectual property use and would be an extractive practice toward the California Native American tribes (FTBML, pers. comm., 2024).
- Develop written MOUs or other written collaboration agreements between CDFW, California Native American tribes, and relevant entities that would embody co-management principles (see Section 6.4, "Tribal Co-Management").

5.2.4 Research to Inform Long-Term Conservation

The scientific understanding of the long-term persistence of western Joshua tree is evolving as research continues. It is currently difficult to determine what ecological factors are influencing long-term persistence. These difficulties are centered around a lack of range-wide demographic data and the amount and frequency of recruitment necessary to maintain populations, uncertainty about the magnitude and timing of heat and drought stressors and how western Joshua tree will respond, and lack of information about the environmental tolerances and population dynamics of yucca moth (USFWS 2023). Therefore, additional research is necessary to fill these information gaps.

MANAGEMENT ACTION R&I 1: CONTINUE RESEARCH AND INFORMATION DEVELOPMENT

CDFW will encourage scientific research needed to inform effective conservation of western Joshua tree. There are currently numerous information gaps related to species genetics, distinct populations, demography, distribution, microbial associations, fire effects, climate response, and other factors that will be important to the conservation and management of western Joshua tree. Science and research are fundamental to long-term species conservation and for developing meaningful strategies to avoid, minimize, and mitigate threats to western Joshua tree. The seven-step approach recommended by Smith et al. (2023) for effective species



conservation in the face of climate change requires acquisition of information that is currently lacking for western Joshua tree. Research also provides a foundation from which to track the success of conservation and management actions and adapt management strategies as needed if monitoring indicates performance targets are not being met.

Action R&I 1.1: Identify Genetic Structure and Distinct Populations

Research focused on genetic studies is needed for western Joshua tree conservation. Preserving a species' full range of genetic variation is one of the pillars of conservation biology. Understanding the range of western Joshua tree's genetic variation is needed to inform effective conservation. Specifically, genomic research is needed following these steps, which are outlined in Smith et al. (2023):

- Quantify neutral diversity (i.e., genetic variation that is not affected by natural selection).
- Delineate genetically distinct populations.
- Identify climate-adaptive variants.
- Catalog adaptive diversity (i.e., range of adaptive traits that make individuals better suited to withstand the effects of climate change and other stressors).

Action R&I 1.2: Collect and Analyze Range-Wide Demographic Information

Develop a program of long-term, range-wide direct population and vegetation monitoring with emphasis on leading and trailing edges, and highest and lowest elevations of the species' range in California. Range-wide demographic information is needed to detect baseline population trends, and identify populations with high recruitment (i.e., addition of new adult plants that develop from seeds or sprouts) and those that do not appear to be recruiting/reproducing new individuals onsite at sustainable levels (i.e., plants are not reproducing at a sufficient rate to replace themselves generation after generation). Researchers should look for collaboration opportunities to develop standardized monitoring protocols to collect demographic data and abundance trends across the species' range, and to establish and maintain a database for data collected.

Action R&I 1.3: Develop Refined Species Distribution Models

Once genetically distinct populations have been delineated, research should use these data to develop refined species distribution models to help identify habitat suitable for western Joshua tree in the future (Smith et al. 2023). Potential refugia models should be validated with range-wide demographic data collection and other independent data sources (Smith et al. 2023).



Action R&I 1.4: Assess Adaptive Genetic Variation

Research should evaluate climate adaptive genomics. Once genetic variation of the species is better understood, researchers should identify subpopulations with adaptive traits that make them better suited to withstand the effects of climate change. Researchers should consider genome-wide association studies, as recommended by Smith et al. (2023), to identify adaptive genes responsible for greater tolerances to heat, drought, and other stressors. Genotypes (genome sequence data) of individuals that survive climate extremes and from populations with greater numbers of individuals with these adaptive traits should be prioritized for conservation and used for assisted gene flow (i.e., relocating genetically adaptive individuals or their propagules to areas already occupied by western Joshua tree to facilitate climate change adaptation).

Action R&I 1.5: Study Yucca Moth

Research should investigate the western Joshua tree's obligate pollinator, yucca moth's life history, environmental tolerances, distribution, local adaptation to host plant populations, and association genetics or other approaches to identifying adaptive genetic variation (see "Pollination" in Section 4.1.3, "Life History"). Researchers should produce range-wide species distribution models for yucca moth; determine the percentage of larvae in diapause that are lost to predation and other factors, such as project-related impacts; and study the cues that trigger metamorphosis.

Action R&I 1.6: Update Ecoregional Assessment

Update previous work done by Randell et al. (2010) and Parker et al. (2018) or other datasets to assess ecological intactness within the entirety of western Joshua tree's range.

Action R&I 1.7: Research Microbial Associations and Restoration Techniques

Research should investigate biocrust associations and arbuscular fungi associations and their role in western Joshua tree conservation, as well as other microbial associations that may be important to western Joshua tree survival. Research should include techniques to restore biocrusts and fungi associations important to western Joshua tree, such as biocrust salvage and transplantation in the wild, and propagation and inoculation techniques in nursery settings. Biocrusts could also be applied to fuel breaks to reduce exposed soil and limit invasive plant establishment while maintaining effective fuel breaks (Condon et al. 2023).

Action R&I 1.8: Investigate Fire Resilience/Postfire Recovery

Research should investigate fire resiliency of western Joshua tree and its nurse plants. Studies could include postfire monitoring of western Joshua tree recruitment, seed production of trees that survive, or basal sprouting. Sweet et al. (2023) suggests monitoring could include collecting baseline data in nurse plant cover at burned sites and following recruitment



patterns. Research should also investigate fire regime-plant community interactions, including the positive feedback loop invasive plants can have on promoting recurrent fire in western Joshua tree habitat (Brooks and Matchett 2006). This research should consider impacts of annual rainfall amounts to inform when invasive plant control is needed to protect western Joshua tree populations (Brooks and Matchett 2006).

Action R&I 1.9: Investigate Invasive Plant Control Techniques

Research should investigate the most effective ways to control the spread and abundance of invasive plant species to reduce fire risk through the following possible activities:

- Identify the most effective treatment strategies to manage invasive species that optimize benefits while minimizing negative tradeoffs under a range of conditions (Abella et al 2023; Reed et al. 2009; Darst et al. 2013; Tuma et al. 2016).
- Investigate indirect effects of herbicide application (e.g., indaziflam) in western Joshua tree habitats, particularly on western Joshua tree seedlings and nurse plants, as well as other native plants. Using this information, identify demographic effects and appropriate avoidance buffer standards and application methods for herbicide use in areas occupied by western Joshua tree (Abella et al 2023).

Action R&I 1.10: Research Long-Term Climate Effects

Research should investigate the effects of multiyear and multidecade climate variability patterns on western Joshua tree recruitment, survival, and population density. Research should aid the development of a large-scale demographic study that is needed to inform conservation acquisitions and other forms of protection.

Action R&I 1.11: Study Salvage and Relocation Methods

Evaluate and improve salvage and relocation methods to increase survival of western Joshua trees salvaged from development sites and transplanted to mitigation sites. Successful relocation can increase the persistence of western Joshua tree and ensure genetic diversity and adaptive variation are retained from populations lost to development.



Source: Drew Kaiser, California Department of Fish and Wildlife.



Action R&I 1.12: Investigate Assisted Migration

Research the feasibility, practicality, effectiveness, and risks of implementing future assisted migration and translocation into areas modeled as climate refugia to which western Joshua tree cannot naturally migrate (Figure 5-2) (Shryock et al. forthcoming). This information would be used to inform the usefulness of conserving lands that are outside the current range of western Joshua tree but that may become suitable for the species in the future under different climate scenarios. Western Joshua trees have low capacity to colonize newly available areas on their own because of their low dispersal ability and limited connectivity between currently occupied and potential future habitat. Assisted migration is frequently contemplated as a conservation tool to get species to newly available habitat; however, further study is needed to determine how this can be done successfully, cost effectively, and without adverse effects to the receiving ecosystems (Smith et al. 2023).

Action R&I 1.13: Study Basal Sprout Survival and Vulnerabilities

Research the resource needs (e.g., nutrients, water) and vulnerability of basal resprouts of western Joshua tree to increase persistence, for example, whether they may be vulnerable to drought or herbivory. Further study could include an analysis of survival data based on various environmental and biological factors and may include unburned reference sites for estimating background mortality. Analysis of these data is ongoing pending further funding support (Sweet et al. 2023). These data will enhance understanding of demographic trends. Research should help inform potential site-specific management needed to ensure growth and survival of individual western Joshua trees.

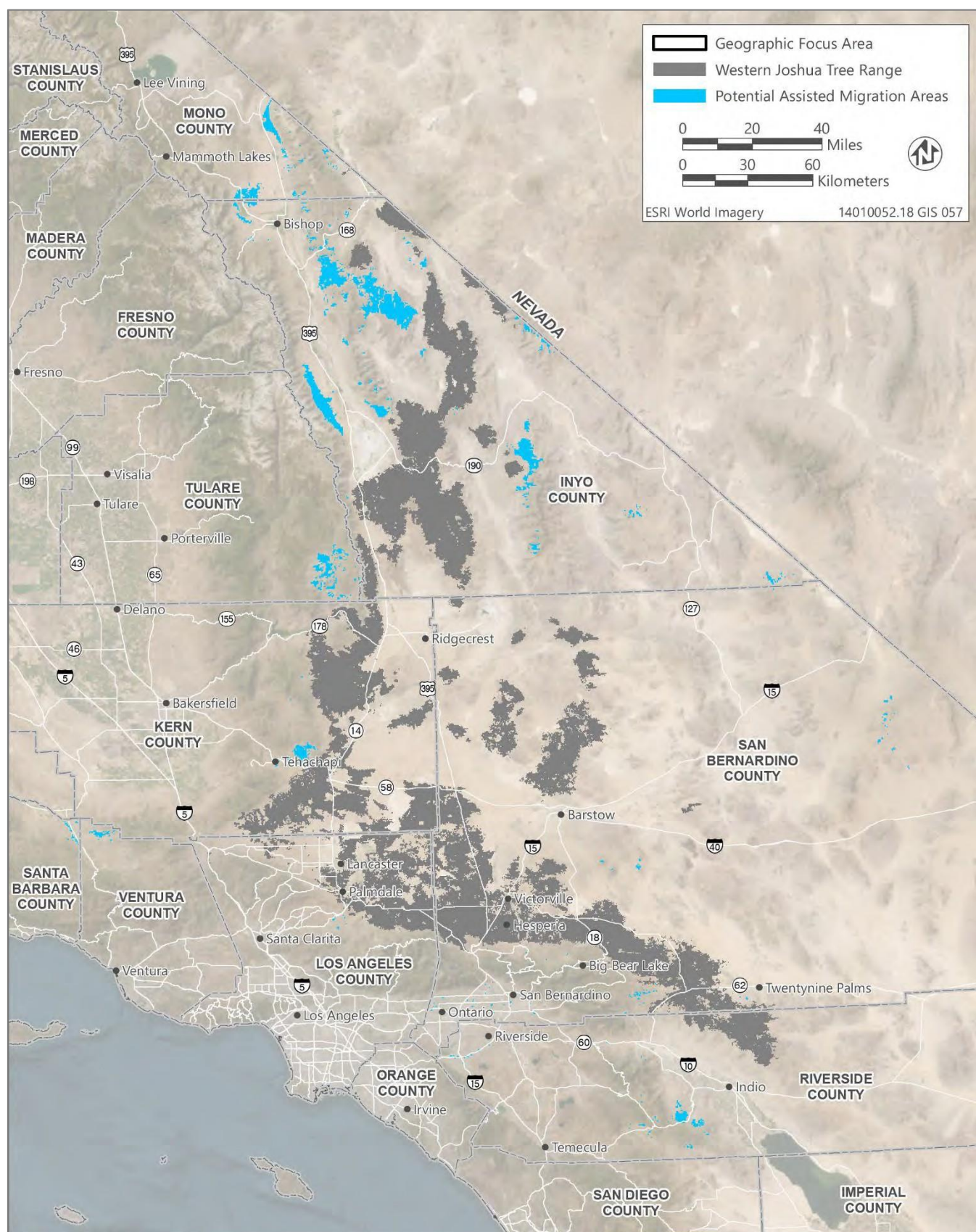
Action R&I 1.14: Tribal Ethnobotanical Studies

Ethnobotanical studies of the greater Mojave Desert and Great Basin regions and western Joshua tree habitat should be conducted if requested by a California Native American tribe. Ethnobotanical studies research how people of a particular culture and region use native plants for food, medicine, shelter, dyes, fibers, oils, resins, soaps, waxes, ceremonial purposes, and more (USFS 2024).

Action R&I 1.15: Develop Additional Fuel Treatment Methods

CDFW will coordinate with California Department of Forestry and Fire Protection (CAL FIRE) and others on developing additional fuel treatment methods for western Joshua tree habitat, including manual and mechanical treatment methods. Once developed, these treatment methods could eventually be included in the minimization measures in Section 5.2.1, above.





Source: Data received from Shryock et. al. in 2024; adapted by Ascent in 2024.

Figure 5-2 Potential Assisted Migration Areas



5.2.5 Education and Awareness

Education and awareness programs will enhance public understanding of western Joshua tree ecology, foster community pride and ownership of western Joshua tree conservation, connect people with their natural world, and inspire people to care about western Joshua tree and its habitat so they will support conservation of the species. A key priority will be ensuring that underserved and overburdened communities have access to—and can engage in—education and awareness programs and opportunities.

MANAGEMENT ACTION E&A 1: SUPPORT EDUCATION AND OUTREACH

Education and outreach programs that increase awareness and appreciation of the cultural, biological, and ecological value of western Joshua tree may provide long-term benefits for conservation of the species. Education and outreach programs can also promote opportunities for all communities to be involved with western Joshua tree appreciation, stewardship, and conservation.

Action E&A 1.1: Support Tribal-Led Educational Outcomes

CDFW will work with Tribes to support tribal priorities for education and outreach to their communities. The following are examples of undertakings or materials that may be developed to support tribal-led and tribal-designed efforts:

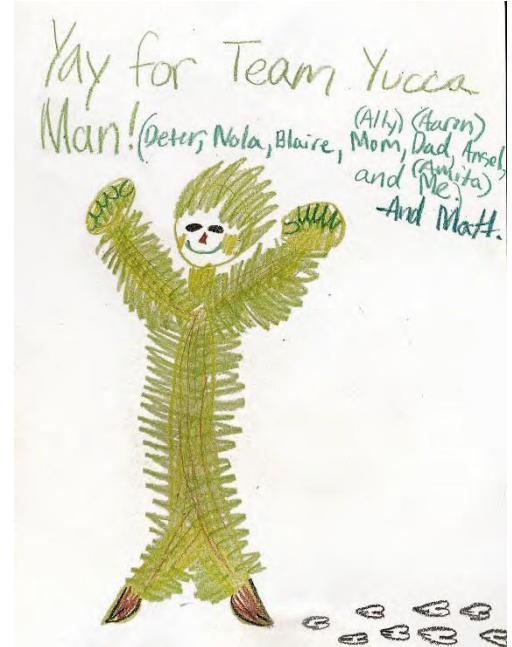
- ethnobotanical studies,
- lesson plans and curricula for various age groups,
- professional certification programs (e.g., for tribal cultural monitors, TEK practitioners, fire and restoration specialists),
- printed materials designed to strengthen cultural knowledge, and
- workshops.

Action E&A 1.2: Develop Publicly Distributed Information

CDFW will work with partners to develop accessible informational items for distribution to the public in multiple languages. The informational items may be handouts, brochures, presentations, digital materials, surveys, interactive web pages, or other outreach tools. Materials should be made available to communities throughout western Joshua tree's range in California with a dedicated focus on reaching underserved communities. Informational items may include the following materials:



- a handout describing how to care for western Joshua tree with information on:
 - watering (none unless they show signs of heat/drought stress),
 - invasive plant removal,
 - nurse plant species to incorporate into landscaping, and
 - signs of pests and solutions for pest infestations;
- science kits, handouts, and web-based western Joshua tree activities for schools to educate young citizens about western Joshua tree and its need for conservation such as:
 - coloring and activity sheets focused on western Joshua tree “fun facts” and biology;
 - a western Joshua tree junior ranger program based on collecting information about the species; and/or
 - a science kit developed in collaboration with local scientists and educators that includes hands-on activities through storytelling, art, or field trips, focusing on western Joshua tree and climate change impacts and solutions, such as a traveling trunk for Climate Kids with the Climate Science Alliance;
- materials and opportunities for the public to participate in western Joshua tree conservation efforts and education, such as:
 - a calendar of volunteer events (e.g., seed collection and restoration) and educational webinars,
 - iNaturalist citizen science project information, and/or
 - Information on recreating outdoors with western Joshua trees responsibly (see Action A&M 2.8, “Minimize Impacts from OHV Use and Outdoor Recreation”);
- collaborations to fund and open a western Joshua tree art gallery or exhibit that could be made available to the public within the geographic focus area of this Conservation Plan and virtually online; and/or
- interactive, web-based ArcGIS StoryMaps for western Joshua tree conservation and education.



Source: Amita Bubb.



Action E&A 1.3: Establish a Tree Adoption Program

CDFW will reach out to partners to encourage organizations to develop opportunities for an adopt-a-Joshua tree program. This program may include the following activities:

- establishing a program in which members of the public can “adopt” western Joshua trees salvaged from development sites and replant them on their private property, and/or
- providing signage that landowners can place on their property to identify “adopted” western Joshua trees.

Action E&A 1.4: Explore Authorizing a Specialized Interest License Plate

CDFW or other organizations may coordinate with the California Department of Motor Vehicles to develop a specialized western Joshua tree interest license plate. Monies generated from sales of the license plates could be added to the Conservation Fund.

Action E&A 1.5: Support Media Promotion

CDFW will coordinate with partner organizations to encourage development of newsletters and conduct western Joshua tree–focused social media campaigns.

Action E&A 1.6: Support Volunteer Opportunities

Cattle sheltered by western Joshua trees.

CDFW will support and encourage volunteer opportunities by promoting them on their website, social media, and printed media (e.g., handouts, newsletters). Special focus will be given to providing opportunities for underserved (i.e., communities that have historically received inadequate investment, resources, or services) and overburdened (i.e., communities that are disproportionately affected by pollution, environmental hazards, and health risks) communities and young

people to participate in and benefit from. This includes connecting these communities with natural areas containing iconic western Joshua trees.

The following volunteer programs may benefit western Joshua tree:

- National Park Service Volunteers-In-Parks (VIP) program,
- California State Parks Volunteer in Parks Program,
- Mojave Desert Land Trust volunteer programs,
- Transition Habitat Conservancy volunteer programs,



- CDFW-led seed collection/banking efforts,
- Yucca weevil tracking projects, such as Mojave Desert Land Trust's 2023 Yucca Weevil Watch hosted on iNaturalist, and
- western Joshua tree flowering/masting tracking projects hosted on iNaturalist.

Action E&A 1.7: Develop Guidance for Grazing Practices

CDFW will coordinate with agricultural organizations to encourage development of guidance regarding grazing best practices in western Joshua tree habitat and make it available to ranchers, rangeland managers, and others in the grazing community.

Action E&A 1.8: Encourage Urban Conservation and Recovery

CDFW will coordinate with local governments to encourage the development of educational materials for private residential and other property owners with western Joshua trees to participate in urban conservation and recovery efforts.

5.3 EFFECTIVENESS CRITERIA

The management actions described in this chapter are necessary to achieve the vision, purpose, and objectives of the Conservation Plan. WJTC requires that the Conservation Plan include objective, measurable criteria to assess the effectiveness of management actions. This section presents preliminary effectiveness criteria to help CDFW and the Commission measure how effective the management actions are in conserving western Joshua tree. These criteria are divided into two sets. One set of criteria is related to the overall conservation of western Joshua tree in California, and the other set of criteria is related to the effectiveness of the Conservation Plan and the use of the Western Joshua Tree Conservation Fund in making progress toward the vision of this Conservation Plan. Although these two sets of criteria are interrelated, the former set is more relevant to the Commission's decision-making authority under the California Endangered Species Act (CESA), and the latter is more relevant for assessing the effectiveness of this Conservation Plan and the Western Joshua Tree Conservation Fund as implemented by CDFW.



5.3.1 Effectiveness Criteria for Conservation of Western Joshua Tree in California

- Global greenhouse gas emissions are reduced to a level that ensures the species is not at risk of extinction from climate change impacts in California. The measurable details of this criterion should be based on science and therefore may change as information improves on critical levels of greenhouse gases in the atmosphere for western Joshua tree survival.
-
- Source: Anna Cirimele, National Park Service.*
- By 2033, when the Commission must reconsider whether listing western Joshua tree is warranted (Fish & G. Code, § 1927.9), 90 percent of land within the predicted climate refugia category under a low emissions scenario (SSP 2-4.5) that remains ecologically core, ecologically intact, or moderately degraded is permanently protected and managed to maximize ecological function for the species and its co-occurring native species. The measurable details of this criterion should be science-based and therefore may change as information improves on critical levels of greenhouse gases in the atmosphere for western Joshua tree survival. This criterion is also dependent on models of the predicted climate refugia category.
 - A large and genetically representative distribution of western Joshua tree is permanently protected and managed to maximize ecological function for the species, and its co-occurring native species. This criterion is dependent on science regarding western Joshua tree population genetics and on models of the predicted climate refugia category. The target for this criterion is 70 percent of priority conservation lands, as identified through Management Action LC&M 1, "Identify Priority Conservation Lands," across the full range of western Joshua tree in California by 2033.
 - Cooperative multiagency strategies are in place to reduce fire risk, aggressively fight wildland fires that threaten western Joshua trees, and fully fund restoration plans that will be implemented in response to wildland fires that kill a demographically significant number of western Joshua trees.
 - A program to monitor and assess western Joshua tree population status based on science has been developed and adopted, and assessments under this program demonstrate that western Joshua tree is sustainable in California for the foreseeable future.



5.3.2 Effectiveness Criteria for the Conservation Plan and the Western Joshua Tree Conservation Fund

- Initial draft priority conservation areas have been identified by December 2025.
- Every 2 years, beginning in 2026 (Fish & G. Code, § 1927.8, subd. (a)), the acreage of priority conservation lands preserved in perpetuity is greater than in the prior 2-year review period. CDFW will first focus on protecting priority conservation lands identified via Management Action LC&M 1, "Identify Priority Conservation Lands." CDFW will seek to protect an additional 3 to 5 percent of occupied western Joshua tree range every 2 years until the effectiveness criteria related to land protection for conservation of western Joshua tree in California are achieved.
- Conservation lands that are protected via the Conservation Fund have an endowment that is sufficient to fund management to maximize ecological function for the species and its co-occurring native species in perpetuity.
- At least one USFWS-approved written MOU or other written collaboration agreement has been established on federal land that protects and safeguards priority conservation lands representing at least 10 percent of occupied western Joshua tree range by 2033.
- At minimum, one written MOU or other written collaboration agreement incorporating co-management principles has been established between CDFW or other land managers and California Native American tribes by 2028.
- As measured every 2 years, more local jurisdictions have incorporated the Conservation Plan's A&M measures into adopted plans and policies.
- CDFW, local fire departments, CAL FIRE, and federal agencies have developed and implemented guidelines for avoiding direct impacts on western Joshua trees during wildland fire suppression and control activities, for fuel treatment implementation, and for preventing accidental ignition of fires during other activities, such as construction and recreation. Local fire departments in the geographic focus area, CAL FIRE, and federal agencies have entered into agreements with CDFW to implement the guidance. The number of jurisdictions implementing the guidelines increases every 2 years.

The preliminary criteria listed above are intended to help CDFW evaluate whether management actions are resulting in long-term conservation of the species. If they are not, it may be necessary to determine if and how the management actions should be modified or replaced.

As ongoing research develops metrics for demonstrating long-term persistence of western Joshua tree in California in the face of climate change, some effectiveness criteria may be modified or added when the Conservation Plan is reviewed and updated.



These initial effectiveness criteria help determine how successful implementing these important actions have been to conserve the species. These criteria will be used to determine if administration of the Western Joshua Tree Conservation Fund, development and execution of written interagency agreements or written MOUs with land management entities, and other actions are effective at achieving the vision, purpose, and objectives of the Conservation Plan.

5.4 PRIORITY MANAGEMENT ACTIONS FOR MANAGEMENT UNITS

Management units are outlined and delineated in Section 4.4, "Management Units," based on criteria for expected climate conditions, quality of habitat, existing management authorities, and land ownership. Organizing the landscape into management units based on these characteristics of the landscape will help guide the application of the Conservation Plan's management actions.

Although the management actions described in this chapter (which are summarized in Table 5-2 below) could apply to any management unit, certain management actions are recommended as priorities for specific management units (Table 5-3). For example, regardless of habitat conservation value, the management actions in Tribal Land units will prioritize establishing co-management principles and mutually defining elements of co-management. Some management actions could be applied throughout the species range without prioritization by management units. For example, conducting research and gathering information will help inform management in all management units in the future. Conducting education and outreach will similarly help educate the public and improve management in all management units.



Table 5-2 Summary of Management Actions

Management Action Abbreviation	Management Action Title
A&M 1	Avoid Direct and Indirect Impacts
A&M 2	Minimize Direct and Indirect Impacts
A&M 3	Minimize Impacts from Wildland Fire and Fire Management
LC&M 1	Identify Priority Conservation Lands
LC&M 2	Protect Priority Conservation Lands
LC&M 3	Manage Conservation Lands
LC&M 4	Restore and Enhance Habitat
LC&M 5	Establish Seed Banks and Nurseries
TCM 1	Establish Co-Management Principles
TCM 2	Mutually Define Elements of Co-Management
R&I 1	Continue Research and Information Development
E&A 1	Support Education and Outreach

Source: Compiled by Ascent in 2024.

Table 5-3 Priority Management Actions for Western Joshua Tree Management Units by Conservation Value Category and Predicted Climate Refugia

Management Unit Type ¹	Ecologically Core and Intact	Predicted Climate Refugia Category ² in Ecologically Core and Intact	Moderately Degraded and Highly Converted	Predicted Climate Refugia Category in Moderately Degraded and Highly Converted
Wilderness	A&M 3 ³ LC&M 3 ³ LC&M 4 ³	A&M 3 ³	LC&M 3 ³ LC&M 5 ³	LC&M 1 ⁴ LC&M 3 ³ LC&M 5 ³
Preservation with Light Recreation/ Other Use	A&M 1 A&M 2 A&M 3 LC&M 3 LC&M 4 LC&M 5	A&M 1 A&M 2 A&M 3	LC&M 3 LC&M 4 LC&M 5	LC&M 1 ⁴ LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3
Defense	LC&M 1 LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3	LC&M 1 ⁴ LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3	LC&M 1 LC&M 2 LC&M 3 LC&M 4 LC&M 5	LC&M 1 ⁴ LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3



Management Unit Type ¹	Ecologically Core and Intact	Predicted Climate Refugia Category ² in Ecologically Core and Intact	Moderately Degraded and Highly Converted	Predicted Climate Refugia Category in Moderately Degraded and Highly Converted
Tribal Land	TCM 1 TCM 2 A&M 1 A&M 2 A&M 3 LC&M 3 LC&M 4 LC&M 5	TCM 1 TCM 2 A&M 1 A&M 2 A&M 3	TCM 1 TCM 2 LC&M 3 LC&M 4 LC&M 5	TCM 1 TCM 2 LC&M 1 ⁴ LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3
Mixed Use	LC&M 1 LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3	LC&M 1 ⁴ LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3	LC&M 1 LC&M 2 LC&M 3 LC&M 4 LC&M 5	LC&M 1 ⁴ LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3
Little or No Protection	LC&M 1 LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3	LC&M 1 ⁴ LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3	LC&M 1 LC&M 2 LC&M 3 LC&M 4 LC&M 5 E&A 1	LC&M 1 ⁴ LC&M 2 LC&M 3 LC&M 4 LC&M 5 A&M 1 A&M 2 A&M 3

¹ Although actions described in this chapter can be applied to any management unit, the actions listed in this table identify the highest priority management actions for each unit.

² Recommendations for the predicted climate refugia category can be applied to any unoccupied future suitable habitat category that is identified.

³ Management activities on conservation lands may be allowed in wilderness areas or may be limited by the administering agency to protect wilderness values.

⁴ If priority conservation lands are identified in the predicted climate refugia category that is present within moderately degraded or highly converted land, management should prioritize avoiding and minimizing impacts.

Source: Compiled by Ascent in 2024.

In ecologically core and intact habitat that currently have land protections (i.e., Wilderness, Preservation with Light Recreation/Other Use), avoiding and minimizing impacts should be prioritized. Because management actions in wilderness areas are limited to protecting wilderness values, coordination with BLM, USFS, and NPS will be imperative. In addition, these areas should prioritize identifying, protecting, restoring, and managing priority conservation lands (Actions LC&M 3, LC&M 4, and LC&M 5), including collecting seed when appropriate. In Tribal Land units, management should follow recommendations for Wilderness and Preservation with Light Recreation/Other Use units, as well as implementing tribal focused management actions. In ecologically core and intact habitat that do not currently have protection or have minimal land protections (i.e., Little to No Protection, Mixed Use, and



Defense), management should focus on identifying, protecting, and managing priority conservation lands and avoiding and minimizing impacts.

Although some lands are classified as ecologically core and intact habitat in the ecoregional assessment, there may be opportunities in these areas to benefit from restoration based on finer-scale and site-specific assessments for specific projects or site-scale planning decisions (Randall et al. 2010). This would be determined on a site-by-site basis.



Source: Jeb Bjerke, California Department of Fish and Wildlife.

Within the moderately degraded or highly converted habitat that have minimal to no land protections (i.e., Little to No Protection, Mixed Use, Defense units), management should focus on identifying, protecting, managing, and restoring priority conservation lands and avoiding and minimizing impacts. For the Little to No Protection units categorized as moderately degraded or highly converted habitat, education and awareness should also be prioritized. In areas of moderately

degraded or highly converted habitat that have land protections (i.e., Wilderness, Preservation with Light Recreation/Other Use), management should focus on identifying, protecting, managing, and restoring priority conservation lands and avoiding and minimizing impacts. To protect wilderness values, some actions may not be allowed or may be limited in Wilderness units by the administering agency. In Tribal Land units, management should follow recommendations for Wilderness and Preservation with Light Recreation/Other Use units, as well as implementing tribal focused management actions.

Management of land in the predicted climate refugia category within ecologically core or intact habitat that have minimal or no protections (i.e., Little to No Protection, Mixed Use, and Defense units) should prioritize identifying, protecting, managing, and restoring priority conservation lands. Management units containing land in the predicted climate refugia category in ecologically core or intact habitat with land protections (i.e., Wilderness, Preservation with Light Recreation/Other Use) should prioritize avoidance or minimizing impacts to the greatest extent feasible. In Tribal Land units, management should follow recommendations for Wilderness and Preservation with Light Recreation/Other Use units, as well as implementing tribal focused management actions.

There may be areas that are degraded but have land in the predicted climate refugia category, so it should be determined whether restoring these areas would further the conservation of the species. Management should prioritize avoiding and minimizing impacts



on any priority conservation lands within degraded areas, or priority conservation lands that contain minimal or no protections that are also within the predicted climate refugia category. The recommendations for areas in the predicted climate refugia category also apply to land within the unoccupied future suitable habitat category where western Joshua trees could naturally disperse (Shryock et al. forthcoming).

In addition, opportunities for assisted migration in areas that are currently unoccupied by western Joshua tree but are potentially suitable for the species and modeled as future climate refugia should receive further evaluation if scientific evidence supports its feasibility and effectiveness. Assisted migration may have conservation value if questions about its effectiveness for species conservation are resolved, costs become feasible, and the owners and managers of receiving land are supportive.



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Appendix E.

Relocation Guidelines and Protocols



Western Joshua Tree Relocation Guidelines and Protocols

California Department of Fish and Wildlife
July 2024

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Introduction

The California Department of Fish and Wildlife (CDFW) developed this document to provide guidance on how and when to relocate western Joshua trees (*Yucca brevifolia*) in order to minimize impacts to populations, prevent habitat fragmentation, and preserve connectivity corridors for gene flow and pollinator migration.

The Guidelines section of this document discusses the circumstances in which CDFW would consider including permit conditions requiring relocation of one or more western Joshua trees under the Western Joshua Tree Conservation Act (WJTCA). The Protocol section of this document provides a summary of best practices for relocating western Joshua trees and increasing the survival rate of relocated (salvage) western Joshua trees. Information on post-relocation maintenance, monitoring, and reporting is also provided. This document will be updated as needed based on the best scientific information available.

Western Joshua Tree Conservation Act Relocation Provisions

Section 1927.3, subdivision (a)(4)(A) of the California Fish and Game Code gives CDFW authority to require WJTCA incidental take permittees to relocate one or more western Joshua trees. Furthermore, pursuant to that subdivision, where relocation is required, permittees must implement reasonable measures required by CDFW to facilitate the successful relocation and survival of salvage trees. Relocation is deemed successful where the health of a salvaged western Joshua tree is stable or improving without any supplemental care after the post-relocation maintenance period. The relocation measures shall include but are not limited to:

1. A requirement that the salvage trees are placed in locations and with proper orientation to improve their chances of survival.
2. A requirement that salvage trees are relocated at a time that maximizes their chances of survival when feasible.
3. A requirement that a desert native plant specialist be onsite to oversee relocation.

Fish and Game Code section 1927.3, subdivision (a)(4)(B) states that CDFW may limit relocation requirements to certain size classes of trees.

This document is intended to fulfill the requirement of Fish and Game Code section 1927.3, subdivision (a)(4)(C) that by July 1, 2024, CDFW adopt guidelines and relocation protocols, developed in consultation with desert native plant specialists, based on the best available science, to relocate western Joshua trees successfully. Pursuant to Fish and Game Code section 1927.3, subdivision (g)(1), the permittee shall be legally responsible for ensuring the measures included in its WJTA ITP are implemented consistent with these guidelines. The permittee may, however, contract with the landowner of the relocation site(s) to conduct the post-relocation maintenance and monitoring activities required under its WJTCA ITP.

Subdivision (g)(2) of that section further states, "[u]nless specifically required by written agreement, a landowner that agrees in writing to allow western Joshua trees to be relocated onto land it owns shall not be liable for the continued survival of the western Joshua trees, shall not be required to manage or maintain the translocated western Joshua trees, and shall not be required to change existing land use practices, provided that the land use practices do not result in the taking, possession, sale, or further translocation of the western Joshua trees." While landowners accepting salvage trees are not responsible for maintaining the trees or otherwise ensuring the trees' continued survival, it is important to note that import, export, take, possession, purchase, and sale of salvage trees or any part or product thereof, is prohibited, except as authorized pursuant to the WJTCA.

The WJTCA also requires CDFW, by December 31, 2024, to prepare a Western Joshua Tree Conservation Plan in collaboration with the Fish and Game Commission, other governmental agencies, California Native American tribes, and the public and to incorporate in the plan, among other provisions, protocols for the successful relocation of Western Joshua trees. The Commission will then consider the plan and take final action on the conservation plan by June 30, 2025. During the one-year period between implementation of the July 1, 2024, relocation standards and finalization of the Western Joshua Tree Conservation Plan by June 30, 2025, CDFW will have an opportunity to supplement the collection of best available science and recommend appropriate amendments as part of the Commission's process of considering and taking final action on the Conservation Plan. These guidelines will be incorporated by reference into the Western Joshua Tree Conservation Plan.

Definitions

The following definitions are used in this document:

Bare root relocation – method for relocating a living western Joshua tree by excavating around the root ball of the tree to dislodge the tree from the ground. Any relocation method other than tree spade relocation (defined below) is considered bare root relocation for the purposes of this document.

Containerize – to place a salvage tree into a container, such as a plastic pot or tree box, for temporary storage.

Project site – the area(s) where project activities are expected to occur (e.g., access, staging, construction, etc.)

Recipient site – a salvage tree's (defined below) final planting location.

Relocation – the removal of a living western Joshua tree from the ground and transplantation back into the ground at another location (referred to as a recipient site).

Relocation area – an area with one or several recipient sites.

Retained tree – a living western Joshua tree that is located within the project site, may be avoided or minimally impacted by the project and will therefore not be relocated.

Root ball – a mass of soil that contains concentrated roots growing from the base of the stem of a western Joshua tree.

Salvage tree – a living western Joshua tree that is being, or has been, relocated. Each western Joshua tree stem or trunk arising from the ground shall be considered an individual tree, regardless of its proximity to any other western Joshua tree stem or trunk.

Size Class A – a western Joshua tree that is less than one meter in height.

Size Class B – a western Joshua tree that is one meter or greater, but less than five meters in height.

Size Class C – a western Joshua tree that is five meters or greater in height.

Tree spade – a specialized piece of heavy equipment that consists of hydraulically controlled spade blades that can encapsulate the root ball of a salvage tree, as well as adjacent soil.

Tree spade relocation – method for relocating a living western Joshua tree by using a tree spade to dig, transport, and replant a western Joshua tree and its root ball.

Best Available Science on Relocation

There are many accounts of successful western Joshua tree relocation (i.e., stable or increasing signs of tree health without any supplemental care after a period of maintenance), but little scientific research has been done to compare the relative success rates for different relocation techniques. Rather, most relocation efforts that monitor salvage western Joshua tree survivorship evaluate only one method of relocation (i.e., using hand tools for small trees and/or excavators or tree spade for large trees) (Wagner 2018, Balogh 2019, City of Palmdale 2024). The best available scientific information on how to achieve success when relocating western Joshua trees therefore comes from the experience of experts working in the field of restoration and Joshua tree relocation. In Bainbridge (2007), the author offers advice on relocating Joshua trees and other salvaged succulents, such as cacti and shrubs, based on his expertise and knowledge. The National Park Service (NPS) (Goodwin 2024) and a tree transplanting expert (Reynolds 2024) also provided CDFW with information relevant to the development of this document.

In addition, CDFW reviewed the results of known relocation projects. Bainbridge (2007) states that "Joshua trees often transplant well but require intensive aftercare and irrigation[.]" Bainbridge suggests that relocation is best done with machinery, but hand tools can also be used. Front loaders, excavators, and hydraulic tree spades are useful.

Tree spades work best in silty or sandy soils but using them is difficult in rocky soils. Salvaged trees can be placed in containers or immediately replanted but should be protected as much as possible from drying winds, heat, and sun. Bainbridge (2007) also mentions that yucca, such as western Joshua trees, seem to survive better if replanted in the same orientation they grew. Overall, Bainbridge (2007) shows the survival rates for salvage trees can be improved if the relocation work is timed carefully, the trees are handled gently, and there is good aftercare and irrigation in a holding facility or at the recipient site. Goodwin (2024) and Reynolds (2024) suggest that minimizing disturbance to the root ball and adequate care after trees have been relocated are the most important factors for successful relocation. Tree spade relocation of western Joshua tree minimizes impacts to roots and can have a success rate of greater than 90% with sufficient aftercare (City of Palmdale 2024, Goodwin 2024, Reynolds 2024). Bare root relocation of western Joshua tree causes more damage to roots and is reported to have a success rate of approximately 50-90% even with sufficient aftercare, based on preliminary findings of a monitoring period of 1-3 years (Goodwin 2024, Reynolds 2024). Beyond the initial 3-year monitoring period, however, success rates can decline (Graver 2024). This document describes additional methods that can be used to aid long-term survival and improve chances of reproduction events. However, there is no foolproof method that guarantees relocation success, and some mortality is always expected to result. Therefore, relocation is considered a method to minimize impacts to western Joshua tree populations, rather than a substitution for mitigation through the payment of fees.

The size and growth pattern of a western Joshua tree may also present additional challenges. Small trees, especially those salvaged through the bare root method, experience higher rates of mortality even with sufficient aftercare (Goodwin 2024). And, though it may be possible to relocate western Joshua trees over 7 meters in height, tree spades may be unable to sufficiently encapsulate the root ball for trees of this size (Reynolds 2024). These trees may also be difficult to stabilize to withstand high wind speeds after being relocated. Dense, clonal reproduction can also affect relocation success. Separating smaller trees from larger, parent trees that are connected through rhizomes below ground can result in higher mortality rates for those smaller trees (Goodwin 2024, Graver 2024).

Guidelines

Relocation Requirement Considerations

CDFW will determine whether relocation will be required under a WJTCA incidental take permit (ITP) during the permit application review process. Factors that CDFW may consider in making this determination for each project site include the following:

- Number of trees to be lethally taken (greater than 20 trees removed);
- Area of impacted western Joshua tree habitat within a project site (greater than 20 acres impacted);

- Avoidance and minimization measures proposed by the applicant to reduce project impacts to western Joshua tree;
- Quality of habitat on, and adjacent to, the project site (e.g., ecologically core or intact);
- Overall population health on the project site (e.g., declining versus stable or increasing);
- Whether the project is within predicted climate refugia for western Joshua tree.
- Extent of permanent project impacts;
- Density of clonal growth; and
- Anticipated temporal impacts of a project including operation or maintenance activities, where applicable.

When CDFW staff determine that a WJTCA ITP will require relocation of western Joshua trees, the applicant will develop a [Relocation Plan](#) for CDFW approval, including the number of trees to be relocated and the method(s) for relocation. Applicants will calculate the number of trees to be relocated based on the number of trees that will be lethally taken as confirmed by the approved census. The number of trees to be relocated will be based on the expected rate of relocation success for each method used, as well as the size class of each tree proposed for relocation, as explained below:

	Bare root relocation ¹	Tree spade relocation ²
Size Class A (<1 m)	30%	15%
Size Class B (≥1m and <5)	20%	10%
Size Class C (≥5m)	10%	5%

Table 1. Recommended western Joshua tree Relocation Percentages

The number of trees in each size class recommended for relocation under a WJTCA ITP should be rounded to the nearest whole number and be greater than zero, provided at least one tree in that size class will be lethally taken. Because tree spade relocation has a higher expected success rate than bare root relocation, the relocation of fewer trees is required to minimize project impacts and offset the expected mortality of salvage trees where the tree spade method is used. See "[WJT Salvage Requirement Calculator spreadsheet](#)" for assistance in calculating salvage tree numbers using a combination of methods.

¹ When conducted in accordance with this document, the expected success rate of bare root relocation is between 50 and 90 percent (Goodwin, J. 2024. Joshua Tree National Park. Discussion with J. Goodwin, Vegetation Branch Manager. *in.*; Reynolds, D. 2024. The Landscape Center. Discussion with D. Reynolds, Project Manger/ISA Certified Arborist. *in.*).

² When conducted in accordance with this document, the expected success rate of tree spade relocation is greater than 90 percent (Goodwin, J. 2024. Joshua Tree National Park. Discussion with J. Goodwin, Vegetation Branch Manager. *in.*; Reynolds, D. 2024. The Landscape Center. Discussion with D. Reynolds, Project Manger/ISA Certified Arborist. *in.*; City of Palmdale. 2024. Report of the City of Palmdale Joshua tree preservation program.).

Example:

Project A is expected to cause lethal take of 200 western Joshua trees: 100 Class A trees, 70 Class B trees, and 30 Class C trees.

- If the bare root relocation method is used, the Relocation Plan should propose relocating 47 trees: 30 Class A trees, 14 Class B trees, and 3 Class C trees.
- If the tree spade relocation method is used, the Relocation Plan should propose relocating 24 trees: 15 Class A trees, 7 Class B trees, and 2 Class C trees.
- If a combination of methods is used, one example of mixed methods may include:
 - Tree Spade: 10 Class A, 5 Class B, 1 Class C and,
 - Bare Root: 10 Class A, 4 Class B, 1 Class C

An approved Relocation Plan is an attachment to the WJTCA ITP and any changes after issuance of the associated WJTCA ITP will require amendment of the permit. If the permittee later wishes to relocate or remove any western Joshua tree that has been relocated on-site, the permittee must apply for a new WJTCA ITP.

Adjustments to Requirements

Upon review of a Relocation Plan, CDFW may, in its discretion, adjust the number of trees in a size class that must be relocated, including at the request of an applicant. Factors that may weigh in favor of an adjustment to the number of trees within a specific size class that must be relocated include:

- A higher number of trees in a different size class will be relocated;
- Trees that will be retained in place that will be minimally impacted;
- The size and physical characteristics of the available recipient sites, including available capacity for additional trees;
- The composition of the soil/substrate and feasibility of the proposed relocation method;
- The overall health of the western Joshua trees to be impacted; and
- The overall health of the western Joshua tree population around the project site.

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Where avoidance and relocation are not feasible (for example, when there are an extensive number of trees), revegetation and/or restoration of habitat can be utilized to minimize impacts. Revegetation and/or restoration undertaken pursuant to an existing statutory scheme requiring success criteria, monitoring, and financial assurances to ensure completion of the revegetation and/or restoration can satisfy this management action.

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Relocation Areas

The applicant should identify one or more relocation areas in the proposed Relocation Plan they submit to CDFW for approval. The permittee should first evaluate if salvage

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trees can be relocated on the project site and if any project design modifications can be made to accommodate salvage trees on site.

If salvage trees cannot be relocated on the project site, the permittee must propose one or more off-site relocation areas that can accept trees designated for relocation. Off-site relocation areas must be within occupied western Joshua tree habitat that has been degraded by impacts (e.g., human, wildfire). If available, priority should be given to relocation areas located within local preserves, parks, land trusts, and conservancies. Salvage trees should not be relocated where relocation activities could disrupt existing

ecosystem processes, the genetic integrity of healthy western Joshua tree populations or the natural communities upon which they depend. Each salvage tree should be relocated as close to its original location as is possible. Criteria for selecting off-site relocation areas include:

- In a natural vegetation community that supports western Joshua trees;
- Within 16 kilometers of the salvage tree's original location;
- Within 152 meters of the salvage tree's original elevation; and
- Occupied habitat that has been previously impacted by wildfire or human activities that have led to the removal or death of western Joshua trees.

Relocation areas that do not meet the criteria listed above may be approved by CDFW on a case-by-case basis.

Once an off-site relocation area has been identified, the permittee must provide CDFW with written permission from the landowner of the proposed relocation area(s) confirming that the permittee will have site access to implement the maintenance and monitoring measures required under the WJTCA ITP. The landowner must also confirm in writing that CDFW staff may access the property to conduct compliance inspections in accordance with the measures outlined in the WJTCA ITP.

This document does not provide guidance regarding how to implement or support the assisted migration of western Joshua tree. At this time there is insufficient research published on the geographic boundaries of genetically distinct populations and/or climate adaptive traits within populations that may be suited for assisted migration to expand western Joshua's tree's range or assisted geneflow to enhance a population's ability to adapt to climate change impacts. Assisted migration, assisted geneflow, and/or boundaries of genetically distinct populations may be discussed in future amendments to this document.

Relocation Plan

Where relocation is required, a Relocation Plan must be approved by CDFW prior to the issuance of an WJTCA ITP. The Relocation Plan may combine bare root and tree spade relocation methods and must include the following information:

- The contact information and qualifications of the desert native plant specialist(s) overseeing relocation;
- The date range when trees will be relocated. If salvage trees will be temporarily stored in containers, the plan must indicate when the trees will be replanted;
- The landowner's name, location name, and address or APN for each relocation area property;
- If salvage trees will be relocated outside of the project site, a signed, written statement from the owner of each relocation area granting permittee permission to relocate salvage trees to the relocation area property and access to implement any maintenance and monitoring measures;

- The unique identifier, size class, planned and contingency relocation methods, current and recipient site GPS coordinates (latitude/longitude in decimal degrees), overall health of each tree, signs of pest/human damage (if any), and a photo of each tree to be relocated, (see the [census instructions](#) for submitting photographs);
- If utilizing multiple receiver sites, the permittee must document the receiver site where each tree will be relocated using the unique identifier and recipient site coordinates;
- If tree spade relocation is proposed, additional trees must be identified for relocation as a contingency in case the tree spade relocation method is impractical due to rocky terrain or other issues. The number of additional trees that must be identified will vary on a project-by-project basis. The information described above must be provided for each additional contingency tree; and
- Any other pertinent information regarding relocation operations.

Each permittee may, but is not required to, use [CDFW's Relocation Plan template](#) and [spreadsheet](#), so long as the permittee's proposed Relocation Plan contains all the required information set forth above. Any questions regarding the development of the Relocation Plan should be discussed with CDFW staff prior to submittal in order to avoid project delays.

Protocol

Pre-Relocation

Selecting Trees for Relocation

Western Joshua trees that are in good health should be prioritized for relocation. Indications that a tree is in good health include where 60% or more of the tree's branches are living; minimal pest damage (no or few bore holes and/or less than 25% periderm [bark] stripping); recent signs of unrestricted hard growth; recent signs of flowering events, and/or strong vigor. Where a tree is greater than 7 meters in height, its size may limit its ability to be successfully relocated. Therefore, healthy salvage trees between 5-7 meters in height should be prioritized within Size Class C.

Siting

Trees identified for relocation should be clearly flagged or marked with a unique identifier and the recipient site should be identified before tree removal begins. Preferred and contingency methods for each relocation should also be identified (e.g., bare root relocation versus tree spade relocation) in advance. Each recipient site should be compatible with the corresponding salvage tree's relocation method (see Tree Spade Relocation under Digging/Tree Removal section below). The recipient site location should also be recorded using a Global Positioning System (GPS) unit and marked with pin flags or wood stakes that are clearly labeled with the unique identifier of the corresponding salvage tree. The permittee should identify a recipient site for each salvage tree that is: accessible for relocation and irrigation equipment, such as

water trucks or trailers; provides or enhances connectivity corridors; and mimics the density of the surrounding WJT population and is located at least 4.5 meters from the nearest western Joshua tree. If possible, recipient site locations should be chosen at random and be spatially balanced throughout the relocation area. Geographic Information System (GIS) tools can assist with this process.

Timing

When feasible, western Joshua trees should be relocated at a time that maximizes their chance of survival. (Fish & G. Code, § 1927.3, subd. (a)(4)(A)(ii).) The optimal time to relocate trees occurs in the fall when heat/drought stress is low and roots have adequate time to reestablish before the onset of hot, dry summer conditions. For bare root relocation, winter is a suboptimal but acceptable time to relocate trees but provides less time for roots to re-establish and may result in lower rates of survival. For tree spade relocation, there is a wider range of suboptimal but acceptable times to relocate trees because this method results in less root exposure and potential water loss through evapotranspiration as compared to bare root relocation. Relocating when trees are exposed to hot conditions for an extended period, should be avoided.

Bare Root Relocations

Winter	Spring	Summer	Fall
OK	Avoid	Avoid	Preferred

Tree Spade Relocations

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
OK	OK	OK	OK	Avoid	Avoid	Avoid	OK	OK	Prefer	Prefer	Prefer

Pre-Relocation Watering

In preparing for relocation, both the salvage trees and the recipient sites should be watered 24-48 hours in advance. An earthen berm 4-6 inches in height should be created around the trees and recipient sites to create water basins that ensure water saturates the soil around the root ball and recipient site. For bare root relocations, the perimeter of the berm should be no less than 24 inches from the base of the trunk. For tree spade relocations, the size of the berm should be slightly wider than the width of the tree spade to be used on that individual. The water basins should be filled with water to just below the top of the berm twice and allowed to fully drain between fillings. Root stimulant additives such as vitamin B1 and rooting hormone may assist in root regeneration but are not required. Root stimulant additives should be utilized according to product label recommendations.

Orientation

Prior to relocation, using a compass set to the correct declination, mark the north side of the tree identified for relocation with a water-based tree marking paint or other CDFW-approved means in a place that will not be impacted or obscured during

relocation operations (e.g., a small paint mark on the trunk 12 inches above ground level or ribbon tape tied to one of the branches on the north side of the tree). When setting a salvage tree in a recipient site, best efforts should be made to place the tree in its original orientation; however, this may not be possible based on the terrain of the recipient site.

Other Pre-Relocation Precautions

- Relocation operations should adhere to the American National Standards Institute Z133 Safety Requirements for Arboricultural Operations.
- Permittees should obtain all information necessary to avoid existing underground infrastructure at salvage and recipient sites prior to relocation (see [Underground Service Alert of Southern California \(DigAlert\)](#)).
- To prevent the spread of invasive species and pathogens, digging equipment should be clean and free from dirt and debris and sanitized with a 10% bleach solution prior to arriving at the site where trees will be salvaged.
- Depending on the method used, tree limbs may need to be trimmed to facilitate relocation. Limbs should only be trimmed as necessary to facilitate relocation.

Relocation

Digging/Tree Removal

If trees are in close proximity to each other (less than 18 inches apart at the bases of their trunks), all efforts should be attempted to relocate the trees together to avoid separation of trees that are connected through rhizomes below ground.

Bare root removal by hand – Relocations using only hand tools should only be done for trees that are less than 1 meter in height. The root ball and surrounding soil should be salvaged in a way that keeps the root ball as intact as possible. This can be accomplished by excavating a circular trench 10-12 inches deep, 1-2 feet from the base of the trunk. Once the trench is complete, hand tools should be used to undercut the root ball and sever the roots below. Only apply as much lateral pressure to the tree as necessary to expose roots for severing with hand tools. The cut surfaces on roots should be kept small to minimize root dieback and exposure to soil-borne pathogens.

Bare root removal by (non-tree spade) heavy equipment/excavator – As with bare root removal by hand, the root ball and surrounding soil should be salvaged in a way that keeps the root ball as intact as possible. There are different ways to accomplish this using an excavator, depending on the tree's size, soil conditions, and other factors. For trees that are less than 1 meter in height, an excavator with a bucket attachment at least 24 inches in width can be used to extract the tree and root ball in one scooping motion. The equipment operator should minimize incidental damage to the aboveground portion of the tree to the greatest extent possible. Root balls should be handled with care when they are unloaded from the bucket. For trees that are 1 meter or greater in height, a trench 18-24 inches deep should be excavated 2 feet from the base of the trunk. If the soil around the root ball stays intact and does not show signs of

fracturing, the tree should be firmly rigged to the rounded exterior of the bucket using nylon straps at least 4 inches in width (Figure 1). Additional cloth padding may be placed around the straps to prevent damage to the periderm. Straps should be rigged at multiple points along the main trunk of the tree to prevent excessive swinging once freed from the soil. Once firmly rigged, the root ball should be undercut using hand tools as safely as possible until all or most of the roots are severed. Snapping roots should be minimized, as much as possible.

If the soil around the root ball does not hold together and shows signs of fracturing and instability when excavating the trench, as is common in sandy soils, the excavator should be used to undercut the root ball as much as possible without causing the tree to fall freely to the ground.

The tree should then be rigged to the bucket attachment using the methods described above and gentle but increasing lateral pressure should be applied to the tree to dislodge the root ball and lay the tree down. Once the tree is resting on the ground, the straps may need to be adjusted in order for the tree to be picked up by the excavator.

Trees removed from the ground using the bare root method should be replanted or containerized within 24 hours of removal.



Figure 1 – Bare Root Removal: Removing soil around the root ball of a salvage tree using hand tools (left). Salvage tree being removed from the ground by an excavator (right).
(Photo credit: National Park Service)

Tree spade relocation – Tree spades come in different sizes based on the width of the soil surface that they can encapsulate (Figure 2). Tree spades can be used to relocate

trees of most sizes. However, they are not recommended for trees over 7 meters in height due to stabilization issues during high-speed wind events after relocation.

The following steps must be carried out sequentially, in a timely manner, and thoughtfully. Each western Joshua tree and corresponding recipient site should be evaluated for tree spade acceptability prior to digging. The desert native plant specialist should evaluate soil conditions to assess whether large rocks or boulders may prevent tree spade blades from fully encapsulating the root ball. This may be apparent by scanning the surface of the surrounding area or reviewing existing soil maps (see "Shallow Excavation Ratings" on [NRCS Web Soil Survey: https://websoilsurvey.nrcs.usda.gov/app](https://websoilsurvey.nrcs.usda.gov/app)). Tree limbs may be trimmed only where necessary to allow the tree spade blades to fully close around the tree. The tree spade size should be selected to ensure the blades do not come within 18 inches of the base of the trunk at ground level. Recipient sites should be dug immediately before, or no more than 4 hours prior to, tree extraction to prevent the soil from drying out and collapsing. Excavated recipient site dirt should be used to backfill the tree removal site where available. Open pits should be flagged with stakes and high-visibility ribbon tape and temporary fencing should be installed around any unattended open pits to prevent people or animals from falling in.



Figure 2. A salvage tree being removed from the ground using a tree spade (Photo credit: National Park Service).

Transporting Trees

If salvage trees are not going to be transported to recipient sites by hand or by the equipment used to extract the tree (e.g., by truck or trailer), precautions must be taken to avoid damage to the tree and root ball. Root balls should be loosely wrapped in burlap and kept moist during transport. Salvage trees should be supported at all times and not dropped or thrown. Salvage trees should be securely transported upright or at a slight angle. Salvage trees may touch other salvage trees during transport, but they should not be stacked or otherwise fully supported by other salvage trees. Salvage trees should be positioned in transport vehicles in a way that minimizes branch entanglement.

Planting Methods

Bare root relocations - The width of each recipient site hole should be approximately 12 inches greater than the width of the root ball. Root balls should fit snugly within their recipient holes to avoid stabilization issues. The depth of recipient sites holes should be 2-4 inches less than the height of the root ball to account for settling. If recipient site holes are dug too deep, they should be backfilled and compacted by foot or using hand tools. Salvage trees should be placed as close to their original orientation as the terrain will allow. Salvage trees should be supported when lowered into holes. Holes should be simultaneously backfilled with soil and water to eliminate air pockets and voids. Soil should be lightly compacted by foot or using hand tools.

Tree spade relocations - The salvage trees should be placed as close to their original orientation as the terrain will allow. If needed, soil should be backfilled and lightly compacted by foot or using hand tools to meet the grade of the surrounding soil surface.

Storage

If salvage trees need to be stored for later replanting, in-ground storage is preferred over containerizing. In-ground storage procedures should follow the pre-relocation water berm, planting, post-relocation water berm, and stabilization methods described herein. Salvage trees stored in-ground should be flagged for avoidance and/or fenced off.

If in-ground storage is not possible, each salvage tree should be placed in a container that is at least twice the size of the unrestricted root ball and includes drainage holes. The containers should be sanitized with a 10% bleach solution. The container should be filled using soil from the removal site if the salvage tree is being stored for less than 6 months or with a soil mix ratio of 100 parts organic potting soil to 160 parts course perlite to 200 parts washed concrete sand to 1 part "13-13-13" fertilizer (Goodwin 2024) if the salvage tree is being stored for longer than 6 months. The bottom one third of the container should be filled with soil mixture before placing the root ball into the container. Once the root ball is placed into the container, the remaining volume of the container should be filled with soil and water simultaneously to eliminate air pockets

and voids. Salvage trees should not be stored in containers for longer than 2 years unless approved by CDFW. Containerized salvage trees should be stored either upright or at a slight angle to improve drainage and prevent root rot. If weather forecasts predict wind gusts over 60 mph, containerized trees should be closely grouped and tied together 24 hours in advance for added stability. If containerized salvage trees are pushed over, they should be promptly righted and stabilized using the methods described below for the duration of the storage period. Containerized salvage trees should be maintained and monitored following the methods described below. If trees show signs of drought stress, watering frequency may need to be increased. Containerized soil should always be allowed to thoroughly dry out before rewatering. Containerizing a salvage tree that has been removed from the ground using the tree spade method in a container would eliminate the benefits from this relocation method; therefore, salvage trees removed from the ground using the tree spade method should always be stored in the ground.

Post-Relocation

Water Basins

An earthen berm at least 4 inches in height should be created around each salvage tree following relocation. The top of the berm should be level. For bare root relocations, the perimeter of the berm should be no less than 24 inches from the base of the trunk. For tree spade relocations, the perimeter of the berm should be the width of the tree spade.

Stabilization

Stabilization material should be installed for salvage trees that are greater than 3 meters in height and for trees that are less than 3 meters in height with a tree height to canopy width ratio that exceeds 2:1. For example, a 2-meter-tall tree with a canopy width greater than 1 meter should have stabilization material installed. Non-abrasive guying materials, such as Arbor Ties, should be attached to three equidistant lateral ground-point anchors outside of the water basin. Guys should be taut but allow for some movement so they do not cause friction in light to moderate wind conditions.

Identification

Each salvage tree should be clearly flagged with tape ribbon or a metal tree tag, and labeled with a unique identifier (e.g., #1, #2, #3) and the relocation date (or the date when first removed from the ground for containerized salvage trees) in the following format: MM/DD/YYYY. Each tree tag should be loosely secured to the main trunk of the tree, rather than nailed directly into hard growth, and should be visible from the south. Each western Joshua tree stem or trunk arising from the ground shall be considered an individual tree requiring flagging, regardless of its proximity to any other western Joshua tree stem or trunk.

Recordation

A GPS unit should be used to record the location of each salvage tree's recipient site. The relocation method (bare root – hand, bare root – excavator, or tree spade) should also be recorded, along with a color photo of each tree taken from the south of the tree facing north. The picture should include the entire tree.

Maintenance and Monitoring

Where relocation is required under a WJTCA ITP, it is the permittee's responsibility to ensure the maintenance and monitoring measures set forth below are implemented and as required in the permittee's WJTCA ITP.

Site Visits

Site visits should be conducted by desert native plant specialists to determine maintenance needs for relocated trees according to the following schedule:

Year 1

- Months 0-3, once every two weeks.
- Months 4-12, once per month.

Year 2

- Months 13-24, every other month.

Year 3

- Months 25-36, every other month only for trees showing signs of declining health.
At the end of the 3-year maintenance period, all trees should receive a final site visit and be assessed according to the Completion Report section below.

During site visits, desert native plant specialists should assess and record maintenance needs for each salvage tree. They should also have a site map showing the locations of all salvage trees, a GPS device to confirm salvage tree locations, and notes and photos from previous visits, and they should be prepared to address maintenance needs during site visit or shortly thereafter.

Watering

During the months of May to September, salvage trees should only be watered during site visits if the total rainfall (or snowfall equivalent) for the region within which the recipient site is located is less than 0.4 inches within the previous 7 days. During the months of October to April, salvage trees should only be watered during site visits if the total rainfall (or snowfall equivalent) for the region within which the recipient site is located is less than 0.3 inches within the previous 7 days. Regional precipitation models may be used in determining rainfall amounts; however, rain gauges within, or adjacent to, relocation areas provide the best indicator of precipitation totals. Water basins should be filled to the top of the berm, but not allowed to overtop the berm.

Tree Health

Tree health should be assessed by a desert native plant specialist and recorded for each salvage tree during site visits. Tree health should consider signs of new leaf growth, branch loss, signs of flowering/fruitletting, signs of pest/human-caused damage, leaf discoloration, restricted hard growth, overall vigor, and other indicators worth noting. If salvage trees are showing signs of increasing health after two years of maintenance, they do not need to be visited during the third year (see reporting requirements below), except for the final site visit.

Invasive Plant Removal

Invasive plants should be controlled and removed within the water basin. Removal should occur before invasive plant seeds reach maturity. Invasive plants should be removed through mechanical methods and hand pulling or with hand tools, rather than by chemical means, and appropriately disposed of. In removing invasive plants, care should be taken to not damage salvage tree roots. A list of common invasive plant species can be found on the California Invasive Plant Council Invasive Plant Inventory (Cal IPC Inventory) website at: <https://www.cal-ipc.org/plants/inventory/>. Native plants should be retained where possible.

Maintenance of Berms, Stabilization Supports, and Identification Markers

During site visits, berms should be checked for height and any breaks that would allow water to escape from the water basin. Stabilization supports should be checked for damage and tightness. If relocated trees are showing signs of leaning, stabilization supports should be added or adjusted. Identification markers should also be checked for intactness, legibility, and maintenance needs.

Completion Activities

During the final site visit at the end of the 3-year maintenance period, berms, stabilization supports, and identification markers must be removed from the relocation area.

Reporting

Where relocation is required under a WJTCA ITP, it is the permittee's responsibility to ensure the reporting measures set forth below are implemented. Where relocation is voluntary, CDFW requests that the permittee provide the same reporting information to CDFW to better inform updates to these guidelines and relocation protocols.

Post-Relocation Reporting

When a WJTCA ITP requires relocation of western Joshua trees, the permittee must submit a post-relocation report to CDFW no more than 30 days after relocations are completed. The post-relocation report should include the following:

- The date range when relocation operations occurred.
- For each salvage tree:

Western Joshua Tree Relocation Guidelines and Protocols
California Department of Fish and Wildlife
July 2024

- The unique identifier and recipient site coordinates;
- The final recipient site, including GPS coordinates (latitude/longitude in decimal degrees);
- The relocation method used;
- The height and diameter of the post-relocation water basin constructed;
- Any stabilization supports installed;
- Any major damage, including any necessary limb trimming, that occurred during relocation;
- Any deviation from the tree's original orientation;
- Any root stimulant additives used in pre- or post-relocation irrigations; and
- A photo of the tree facing north, with the unique identifier in each file name.

Maintenance Reports

When a WJTCA ITP requires relocation of western Joshua trees, the permittee must submit annual reports detailing the 1-year and 2-year maintenance periods, as appropriate, to CDFW. Maintenance reports should include the following information:

- The date(s) when site visit(s) occurred;
- The contact information and qualifications of the desert native plant specialist(s) performing tree assessments;
- Information for each salvage tree regarding the following:
 - The unique identifier and recipient site coordinates;
 - Whether the tree is alive or dead;
 - Dates of supplemental waterings;
 - Identity and estimated number of invasive plants observed/controlled and the methods used;
 - Any signs of pest/human damage;
 - Any signs of declining tree health;
 - Any maintenance conducted to repair, replace, add, or adjust berm, stabilization supports, and/or identification markers;
 - A photo of the tree facing north, with the unique identifier in each file name; and
 - At the end of the 2-year period, the reasons for discontinuing maintenance on trees showing stable or increasing health, such as new leaf growth, flowering/fruitletting, good leaf color, no signs of pest/human damage, and/or unrestricted hard growth.

Completion Report

A completion report must be submitted to CDFW no more than 30 days after the end of the 3-year maintenance period. The completion report must contain the following:

- The date when the final site visit occurred;

- The date when berm/stabilization materials/identification markers were removed;
- The contact information and qualifications of the desert native plant specialist(s) performing the final assessment;
- Information for each salvage tree regarding the following:
 - Whether the tree is alive or dead;
 - Any damage that occurred during or after relocation;
 - Any signs of declining health;
 - Any signs of pest damage; and
 - A photo of the tree facing north, after berm, stabilization materials, and identification markers are removed, with the tree's unique identifier in each file name; and
- Any recommendations that may help to improve tree relocation methods.

Literature

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Balogh, M. A. 2019. Mojave Desert ecosystem recovery: Potency of biotic and abiotic restoration methods in low elevation plant communities. University of Nevada, Las Vegas, Thesis, Las Vegas, Nevada, USA.

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Wagner, M. L. 2018. Factors influencing revegetation efforts in the Mojave Desert: Field studies and meta-analysis of the Morongo Basin and Joshua Tree National Forest. California State Polytechnic University, Thesis, Pomona, California, USA.

Personal Communications

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Graver, N. 2024. Joshua Tree National Park. Desert Native Plant Specialist Review of "Western Joshua Tree Relocation Protocol". [10 June 2024].

Reynolds, D. 2024. The Landscape Center. Discussion with D. Reynolds, Project Manager/ISA Certified Arborist. [1 May 2024].



VIA E-MAIL: fgc@fgc.ca.gov

May 29, 2025

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-209

Re: Large-scale Solar Association's Comments on June 12 Meeting Agenda – Western Joshua Tree Conservation Plan (Agenda Item 22)

Dear President, Vice President, and Members of the Commission:

On behalf of the Large-scale Solar Association (LSA), the Solar Energy Industries Association (SEIA), and the American Clean Power Association (ACP), we submit these comments on the revised draft Western Joshua Tree Conservation Plan (Plan). As leaders in California's clean energy transition, our organizations are committed to environmental stewardship and the thoughtful integration of renewable energy with conservation goals. Our members' projects are developed with careful attention to minimizing ecological impacts, and we appreciate the effort to support the long-term viability of the Western Joshua Tree (WJT). However, we remain deeply concerned that the final Plan imposes measures for buffer zones, seed collection, and relocation, as explained in LSA's letter of January 30, 2025, that are technically infeasible and misaligned with the underlying abundance of the species. These requirements, if not implemented reasonably and flexibly, will undermine the intent and efficacy of the Western Joshua Tree Conservation Act (Act) itself.

For example, the Department of Fish and Wildlife (Department) has been imposing requirements for habitat management lands for tree relocation that are ultra vires of the Act. Requiring a permittee to encumber lands it already owns, acquire and encumber new lands, or purchase the right to use and encumber the lands of another to receive trees is plainly a mitigation requirement. However, the Act provides that mitigation would be accomplished through the payment of an in-lieu fee, if the permittee so elected. To say that this additional mitigation requirement undermines the Act is an understatement.

Wholly apart from these fundamental flaws of the draft Plan, its adoption would be premature given the lack of stakeholder engagement on the final Plan.

These comments supplement LSA's letter of January 30, 2025 by outlining the following concerns and recommendations regarding the final Western Joshua Tree Conservation Plan:

- **Clarification and refinement of relocation guidelines:** As described in LSA’s prior comments, the relocation protocols outlined in the Plan disregard the viability or likelihood of successfully re-establishing WJTs, and they fail to acknowledge the fact that viable relocation sites are scarce. There is a lack of evidence outlining these relocation guidelines, and they challenge utility-scale solar project viability by requiring developers to identify, purchase, and manage additional lands for relocated trees. As would be expected, the additional costs to large-scale solar development are ultimately borne by ratepayers.

LSA, SEIA, and ACP believe that, in the first instance, the Plan should tie relocation requirements to the Act’s existing conservation and development fee zones to direct resources to where they can have the greatest ecological impact. Once such lands have been identified, the Department should not require a permittee to pay for the acquisition of a fee interest and/or conservation easement or deed restriction to support relocated trees, as doing so would amount to double (or more) mitigation on top of the fees paid pursuant to the Act. However, we would not be opposed to the Department’s using monies from the mitigation fees paid by the permittee (i.e., from the Western Joshua Tree Conservation Fund) to fund habitat mitigation lands to which trees can be relocated.

- **Acknowledgement of evidence regarding species abundance:** The Department’s Status Review previously demonstrated that the WJT is “widespread and abundant,” across its range, however, the Plan’s proposed conservation strategy neither recognizes nor reflects this reality. As a result, buffer zone, seed relocation, and relocation requirements as specified by the draft Plan and as implemented by the Department to date in issuing permits under the Act have been grossly disproportionate to the “widespread and abundant” nature of the species.
- **Recommendation to Delay Final Plan Vote:** Stakeholders have not been afforded an opportunity to review and analyze the final amended Plan, as it has not yet been released to the public. Robust transparency and public engagement are longstanding hallmarks of California’s regulatory processes, and the absence of both here is troubling given the complexity, breadth, and precedent-setting nature of the Plan, which governs not only the protection of a candidate species, but also the development of climate-critical clean energy projects within the Plan area. California can ill-afford to miss the mark with this Plan. To this end, we urge the Commission to delay its vote until a later meeting to allow for review and revision of the updated final Plan. A brief delay would enable the kind of stakeholder engagement and Department and Commission consideration the Plan deserves, and it would ensure stakeholders can adequately evaluate and contribute to the Plan before it is finalized.

Clarification and Refinement of Relocation Guidelines

The relocation protocols outlined in the Plan present fundamental and immense challenges to utility-scale solar developers. Their impracticality is difficult to overstate. They lack the necessary robust scientific basis. And they fail to reflect the policy architecture of the Act. While we support conservation measures that protect the species, they must be calibrated with the operational realities of large-scale solar development and the scientific uncertainty that still surrounds Western Joshua Tree relocation (to say nothing of the “widespread and abundant” nature of the species).

As LSA has previously emphasized, the Act both provides the Department discretion whether to require relocation and includes no mandatory numeric or percentage thresholds. The Department should exercise this discretion in a way that aligns with both the still-nascent and evolving science and the dual goals of the Act – species conservation and continued development of clean energy to combat climate change, the most significant long-term threat to the WJT.

Technical Feasibility and Scientific Uncertainty

Evidence indicates that relocated mature Joshua Trees – particularly those over 10 feet tall or with multiple branches – have a low survival rate.¹ This is especially true in arid, disturbed environments where many of the utility-scale solar projects are expected. Yet the draft Plan imposes onerous and expensive relocation obligations without regard to the viability or likelihood of successful establishment. Moreover, the current Plan fails to acknowledge the fundamental scarcity of viable relocation sites. Most lands within the WJT’s range are federally controlled and thus unavailable for relocation. The remaining private lands are costly and difficult to acquire, as demonstrated by the Department’s own limited success in securing lands through the WJT Conservation Fund. Those costs will ultimately burden ratepayers. Moreover, and in any event, requiring projects to identify, purchase, and manage additional lands for relocated trees in the guise of minimization is mitigation not contemplated by the Act and its in-lieu fee mitigation regime. Simply put, it is inconsistent with the Act. However, as noted above, LSA, SEIA, and ACP do not object to the Department using mitigation fees paid pursuant to the Act to fund the acquisition of such lands or interests in land.

Need for Zone-Based Relocation Requirements

A critical oversight in the current Plan is its failure to tie relocation requirements to the Plan’s existing conservation and development fee zones. The Act intentionally established two zones – higher-fee and lower-fee areas – to allow for targeted conservation without unduly impeding vital infrastructure projects. Relocation requirements should mirror this framework. Explicitly integrating relocation guidelines with zonal designations would help direct resources to where they can have the greatest ecological impact, rather than applying blanket rules that may be wasteful and counterproductive in practice.

¹ *Western Joshua Tree Relocation Guidelines and Protocols*. April 2025. California Department of Fish and Wildlife. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=224036&inline>.

Acknowledgement of Evidence regarding Species Abundance

According to data presented by the Department, the Western Joshua Tree remains “widespread and abundant” across its range.² The conservation strategy proposed in the Plan should reflect this reality, especially since failure to limit the scope of the Plan could result in a de facto land use management plan for 2.5 to 3.4 million acres (Status Review at 18). As noted, onerous and costly relocation measures are disproportionate to the actual threat levels identified in the Department’s own analysis.

Given the resilience and ubiquity of the species, we question whether such a prescriptive, inflexible relocation regime is scientifically justified. Strict, inflexible guidelines applied uniformly across the landscape risk stifling much-needed renewable energy development while offering limited additional ecological benefit to a species that is not imperiled at this time. The relative abundance of the species should inform all aspects of the Plan, including buffer and seed collection requirements.

Recommendation to Delay Final Plan Vote

We are troubled that the Commission is scheduled to vote on the final Plan without having made the final document available to stakeholders for review. In fact, the attachments posted online under the Commission meeting documents merely state: “June 2025 Update Coming Soon!” Stakeholders have consequently not had an opportunity to review and analyze the final measures that will guide permitting and relocation for years to come. This lack of transparency and engagement is particularly vexing given the complexity and breadth of the Plan, its precedent-setting nature, and its effect on climate-critical clean energy projects across millions of acres of land.

At approximately 3 pm on May 28, 2025 – the afternoon before comments on the Plan are due to the Commission – the Department sent by e-mail its proposed revisions to perhaps the most important and controversial component of the draft Plan: the Western Joshua Tree Relocation Guidelines and Protocols. (The revised document appears to be mistakenly dated “April 2025.”) While we are currently reviewing this revised document to understand how it will impact clean energy project development, our overarching comments in LSA’s January 30, 2025 letter and this letter remain the same. We continue to urge the Commission to postpone its vote to a future meeting to allow time to review this document, a key component of the Plan’s appendices as it relates to clean energy.

We respectfully urge the Commission to delay its vote until a later meeting, as suggested by President Zavaleta in the April Commission meeting, to allow for a full review of the updated final Plan. Stakeholders should be given adequate time (no less than 30 days) to

² *Report to the Fish and Game Commission – Status Review of Western Joshua Tree (Yucca brevifolia)*. March 2022. California Department of Fish and Wildlife.
https://www.biologicaldiversity.org/programs/public_land/pdfs/Western_Joshua_Tree_Status_Review_2022-04-13.pdf.

conduct a meaningful review to provide substantive feedback at a future Commission meeting. Although the Act sets a June 30, 2025 target for approval, that target is aspirational and should not be treated as binding in a way that compromises good governance and sound decision-making. In this case, a brief delay would enable a much-needed robust stakeholder engagement and consequently a better-informed and tailored Plan. The stakes are simply too high for a rushed vote.

We urge the Commission to take a prudent, transparent approach that fosters collaboration and trust in the development of this precedent-setting conservation framework. Ensuring stakeholders can fully evaluate and contribute to the Plan before it is finalized is not merely reasonable – it is essential.

Conclusion

California is at an historic inflection point when it comes to addressing the nexus between climate action and conservation. The Western Joshua Tree Conservation Plan itself is a product of this crossroad – an effort obligated to protect both the species and the clean energy pathways critical to securing their long-term survival. It both the direction of the Act and the Commission's responsibility to balance these interrelated priorities with clarity and foresight. A truly functional Plan will be one that acknowledges the abundance of the species and revises the clean energy mitigation and relocation guidance accordingly – a balance that will require additional time for stakeholders, the Department, and the Commission to achieve.

We appreciate your leadership in this effort and your willingness to pursue policies that are more reflective of the complex future we face. Thank you for your consideration of our recommendations.

Sincerely,



Shannon Eddy
Executive Director
Large-scale Solar Association



Stephanie Doyle
Director, State Affairs, California
Solar Energy Industries Association



Quintana Hayden
Senior Director, Wildlife & Federal Lands
American Clean Power Association

From: Villenas, Fabian <Fabian.Villenas@cao.sbcounty.gov>
Sent: Thursday, May 29, 2025 04:00 PM
To: FGC <FGC@fgc.ca.gov>
Cc: Fletes, Leia <Leia.Fletes@cao.sbcounty.gov>
Subject: Written Comments - June 11-12 Commission Meeting Item No. 22

Please find attached a comments letter from San Bernardino County for Item No 22, Review and Adoption of the Western Joshua Tree Conservation Plan, for the June 11-12th Fish and Game Commission meeting.

Fabian Villenas

Legislative Analyst

County Administrative Office

Phone: 909 387-4777

385 North Arrowhead Avenue

San Bernardino, CA 92415



Our job is to create a county in which those who reside and invest can prosper and achieve well-being.

www.SBCounty.gov



County Administrative Office
Governmental & Legislative Affairs

Leia Fletes
Director

June 11, 2025

Erika Zavaleta, President
California Fish and Game Commission
715 P Street, 16th Floor
Sacramento, CA 95814

Re: Draft Western Joshua Tree Conservation Plan – Public Comments

Dear President Zavaleta and Members of the Commission,

On behalf of San Bernardino County, I would like to thank the Fish and Game Commission for its thoughtful deliberation throughout the development of the Western Joshua Tree Conservation Plan (Plan). The County has actively engaged in this process from the outset, given our significant interest in how the Plan will affect both the construction and maintenance of essential infrastructure and the quality of life and safety for residents in Mojave Desert communities located within Western Joshua Tree (WJT) habitat. In addition to participating in public workshops hosted by the California Department of Fish and Wildlife (CDFW) since 2024, the County submitted formal comments at the Commission's hearings in January and April 2025.

While we recognize the considerable work that has gone into crafting the Plan, we remain concerned about its practical implications. We support efforts to preserve this iconic species for future generations but urge the Commission to ensure that conservation measures are balanced with ongoing needs for housing, economic opportunity, and infrastructure development, including strategies that enhance wildfire resilience and enable home hardening.

The County will continue to closely monitor the Plan's implementation and remains committed to working with the Commission and CDFW to address areas where adjustments may be warranted to ensure both ecological and community sustainability.

At the April hearing, we were encouraged to hear that several of the County's recommendations are being considered. Specifically, we support reducing buffer requirements for WJTs to a maximum of 20 feet, regardless of tree size. The current buffer guidance, which can extend up to 186 feet, is overly restrictive and inconsistent with the documented ability of mature WJTs to coexist with public infrastructure. A smaller buffer would still support conservation goals while significantly reducing the cost of permitting and mitigation. ***We appreciate CDFW's indication that revised buffer guidance is under***

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development and may be included in the Plan's appendix or as a separate guidance document.

We also appreciate the acknowledgment of our recommendation regarding wildfire safety. ***We support the proposed development of a programmatic framework to allow defensible space within five feet of structures, as confirmed by CDFW staff at the meeting.*** This exemption, which aligns with State Fire Marshal best practices, is critical to reducing wildfire risk and protecting both human life and Joshua tree populations in urban-wildland interface zones.

While we welcome progress on these two issues, ***we continue to advocate for an explicit exemption in the Plan for imminent and emergency infrastructure repairs necessary to protect life and property.*** Agencies such as the San Bernardino County Department of Public Works must be able to act swiftly to maintain or restore critical infrastructure, such as roads and flood control systems, particularly during or in preparation for emergencies. Delays caused by unclear permitting requirements in these situations jeopardize public safety and the continuity of essential services. We strongly urge the Commission to incorporate a clear exemption for imminent and emergency repairs in the final Plan.

San Bernardino County appreciates the opportunity to engage in this important effort and urges the Commission to adopt a balanced approach that protects the Western Joshua Tree while supporting the infrastructure and safety needs of our desert communities. We remain committed to working with the Commission and CDFW to ensure that implementation reflects both conservation priorities and operational realities on the ground. If you have any questions or require additional information, please contact Leia Fletes, Director of Government Relations, at (909) 387-4280 or Leia.Fletes@cao.sbcounty.gov.

Sincerely,



Dawn Rowe
Third District Supervisor
Chair, San Bernardino County Board of Supervisors

CC: Inland Empire Legislative Delegation

From: Janet Yochmowitz <JYochmowitz@yucca-valley.org>

Sent: Tuesday, April 15, 2025 05:17 PM

To: FGC <FGC@fgc.ca.gov>

Subject: Commission Meeting Wednesday, April 16, 2025, Item 14 Western Joshua Tree Conservation Plan

Dear Ms. Miller-Henson, Executive Director, Ms. Samantha Murray, President, Honorable Commissioners, and Mr. Charlton H. Bonham, CDFW Director,

Please see the attached public comments, provided by the Town of Yucca Valley for the April 16, 2025, Fish and Game Commission Meeting, Item 14 Western Joshua Tree Conservation Plan.

Kind regards,

Janet Yochmowitz

Town of Yucca Valley

Community Development/Planning Division

58928 Business Center Drive

Yucca Valley, CA 92284

760.369.1265 extension 310

Office Days & Hours – Monday to Thursday, 7:30 am to 5:30 pm. The Office is closed from 12:00 pm to 1:00 pm.

April 15, 2025

Samantha Murray, President
California Fish and Game Commission
715 P Street, 16th Floor
Sacramento, CA 95814

RE: DRAFT WESTERN JOSHUA TREE CONSERVATION PLAN

President Murray and Members of the Commission:

The Town of Yucca Valley (the Town) appreciates the opportunity to provide comments on the Draft Western Joshua Tree Conservation Plan (WJTCP).

As the Draft WJTCP has been modified to indicate it is not designed or intended to create permitting standards and requirements, the Town requests the following.

That the Commission direct the Commission staff, as well as the Fish and Wildlife Director, to propose changes to the Western Joshua Tree Conservation Act to the Legislature and the Administration in the following areas.

Exemptions for Existing Development

Due to the density of the western Joshua tree (WJT) in the Town, basic maintenance functions are prohibitively expensive for property owners by the implementation of the WJTCA. These basic maintenance functions apply to existing residential, commercial, and industrial development. This category of exemption would apply only to existing developments that do not propose any enlargement or expansion of existing development:

- Replacement of septic systems and leach fields (see Appendix A).
- Replacement of utility lines, water, natural gas, electricity, cable, telephone, fiber optic, etc.
- Sewer connections (see Appendix A).
- Ground mount solar.
- Reconstruction/paving of parking lots.
- Replacement of fire/flood damaged/destroyed structures.

Planning
(760) 369-6575
Public Works
(760) 369-6579
Building and Safety
(760) 365-0099
Code Compliance
(760) 369-6575
Engineering
(760) 369-6575
Animal Control
(760) 365-1807
Animal Shelter
(760) 365-3111
FAX (60) 218-0084



The Town of
Yucca Valley

COMMUNITY DEVELOPMENT/PUBLIC WORKS DEPARTMENT

58928 Business Center Dr.
Yucca Valley, California 92284

Maintenance of existing development should be classified as exempt from mitigation fees and ITP requirements.

Exemptions for the Maintenance of Existing Public Works Improvements

The majority of street infrastructure within the Town has existed for forty to fifty years or more. Very few new streets have been constructed since the Town incorporated in November 1991. Utility companies have been installing, maintaining and replacing utilities in these streets for as long as 50 years. Maintenance of existing infrastructure and utilities should be classified as exempt from mitigation fees and ITP requirements. Below are examples of typical maintenance projects:

- Maintenance and repair of existing streets, slurry/cape seals, overlays, reconstruction, etc., but does not include any expansion beyond existing improvement limits.
- Maintenance, repair, and replacement of all utilities within the existing street limits. This does not include any expansion beyond existing improvement limits.
- Maintenance and repair of public park facilities.
- Maintenance and repair of public buildings and their supporting properties.

Exemptions for the State Mandated Wastewater Collection Program

The California Regional Water Quality Control Board (RWQCB) is requiring the implementation of a sewer treatment system in Yucca Valley as part of an existing discharge prohibition order. Phase 2 of the sewer project includes the connections of homes that are located in areas with dense western Joshua trees. In some cases, connecting to the sewer will cost tens of thousands of dollars just in CDFW mitigation fees (see Appendix A), in addition to contract fees, permit fees, CEQA fees, biologist consultation fees, etc. As a disadvantaged community, homeowners in Yucca Valley, particularly in denser WJT habitat, will not be able to afford to connect to the sewer as well as afford the required mitigation fees. Exemption for lateral connections to the regional system would address this issue.

Appendix A includes an analysis prepared by MSA Consulting to assess the potential estimated mitigation fees associated for connecting 3 different single-family homes in Yucca Valley to the sewer. These estimates do not include the other mandatory related fees listed above (CEQA, biologist consultation, permit fees, etc.). The number of individual WJT within 50' of ground disturbance for each sewer lateral range from a low of 74 individual WJT to a high of 138 individual WJT. These estimates do not include WJT that are further than 50' from ground disturbance. The estimated mitigation fees range from \$46,700 to \$62,900 per single-family property. With the other associated fees listed above, it can be anticipated that the cost to obtain an ITP from CDFW will be extensive for each homeowner. According to the 2023 U.S. Census, the median household income in the Town is \$55,302 and the per capita income is \$32,643. The resulting financial strain would

be immense for these homeowners and not possible for some to pay. Installation of State mandated sewer connections should be classified as exempt from mitigation fees and ITP requirements.

Exemptions for Accessory Dwelling Units

The development of accessory dwelling units (ADUs) implements State priorities and helps address the existing California housing shortage. Infrastructure already serves these residential properties. The WJTCA severely limits any new residential subdivision activity in the Town, as WJT density and local housing market will not support payment of mitigation fees to support new subdivision activity. As a result, development of ADUs is critical to meet the State's housing goals. Construction and maintenance of ADUs should be classified as exempt from mitigation fees and ITP requirements.

Exemptions for Infill Residential Development

Infill development is already served by infrastructure including roads, flood control improvements, and utilities. Numerous properties were subdivided and served by infrastructure prior to the Town's incorporation. This includes the construction of new single-family and multi-family homes, as well as accessory dwelling units in accordance with State law. Construction and maintenance of infill single-family and multi-family dwelling units should be classified as exempt from mitigation fees and ITP requirements.

WJTCP Buffers

A desert native plant specialist, as defined by the State, should determine the required buffer distance to avoid potential impacts to a WJT on a case-by-case basis consistent with previous direction from the California Department of Fish & Wildlife (CDFW).

Fire Hazards and WJT and Habitat Conservation

Page 2-68 of the WJTCP briefly addresses the Local Responsibility Area for fire response and notes that there are opportunities for CDFW to collaborate with local fire departments on fire management strategies that benefit WJT on private property. The Town's wildlife urban interface abuts the Joshua Tree National Park. Recent fires in the State have put a microscope on what property owners can do to ensure their properties are maintained free of dry brush and dead vegetation without potentially affecting WJT habitat area in violation of the California Endangered Species Act (CESA)/Western Joshua Tree Conservation Act (WJTCA).

A defined distance for fire safety from existing structures would allow for an appropriate fire-safe buffer to be provided to homeowners. In the absence of such an exemption, homeowners will face difficulty in maintaining or obtaining property insurance. A property owner clearing dry brush and vegetation within WJT habitat should be eligible for a hazard management permit and should be exempt from mitigation fees and ITP requirements.

If you have any questions or require additional information, please contact me at 760-369-6579 Extension 305 or sstueckle@yucca-valley.org.

Best regards,

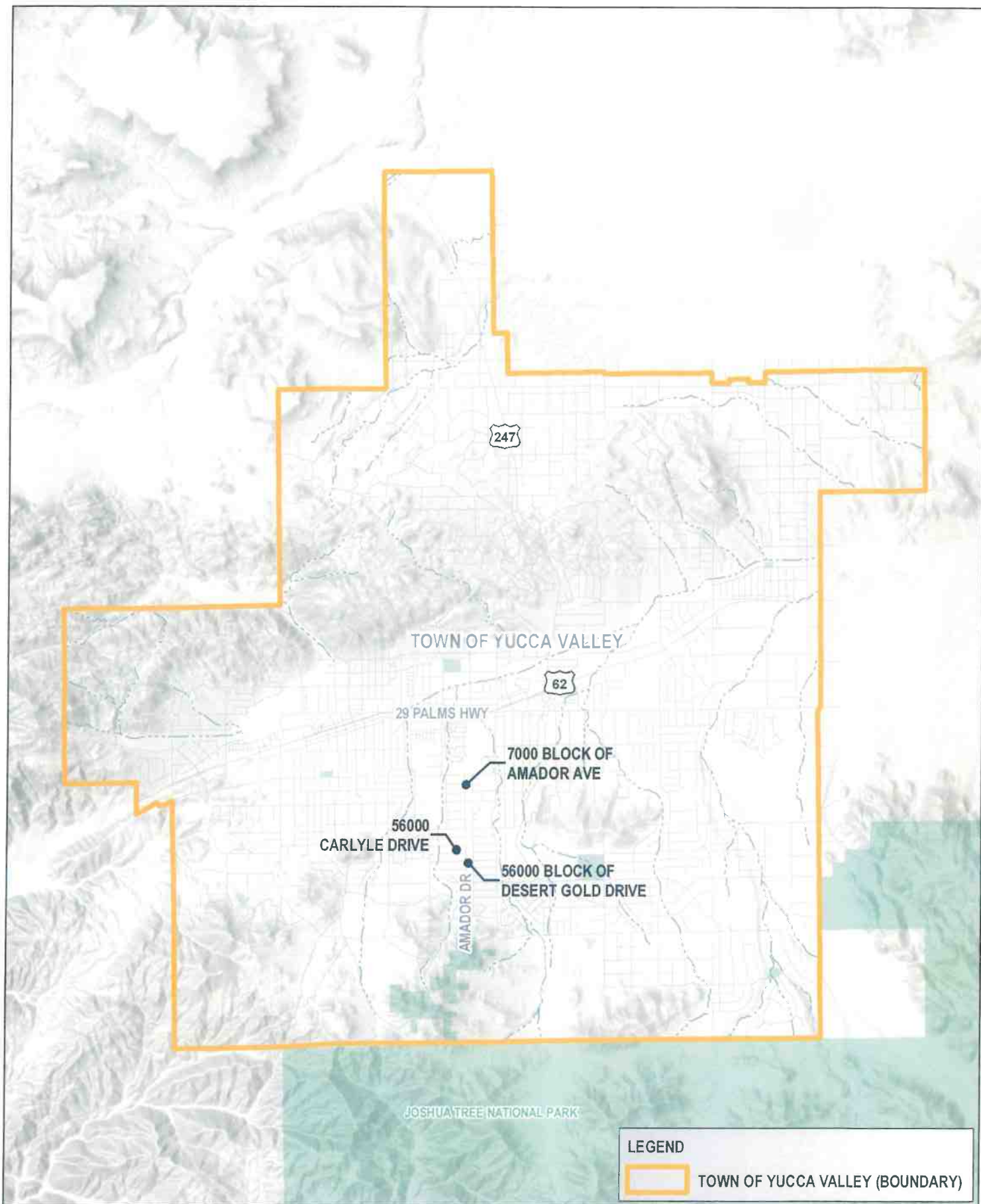
A handwritten signature in black ink, appearing to read 'S. Stueckle', enclosed within a large, loopy oval shape.

SHANE R. STUECKLE
Deputy Town Manager

Attachment(s)

APPENDIX A

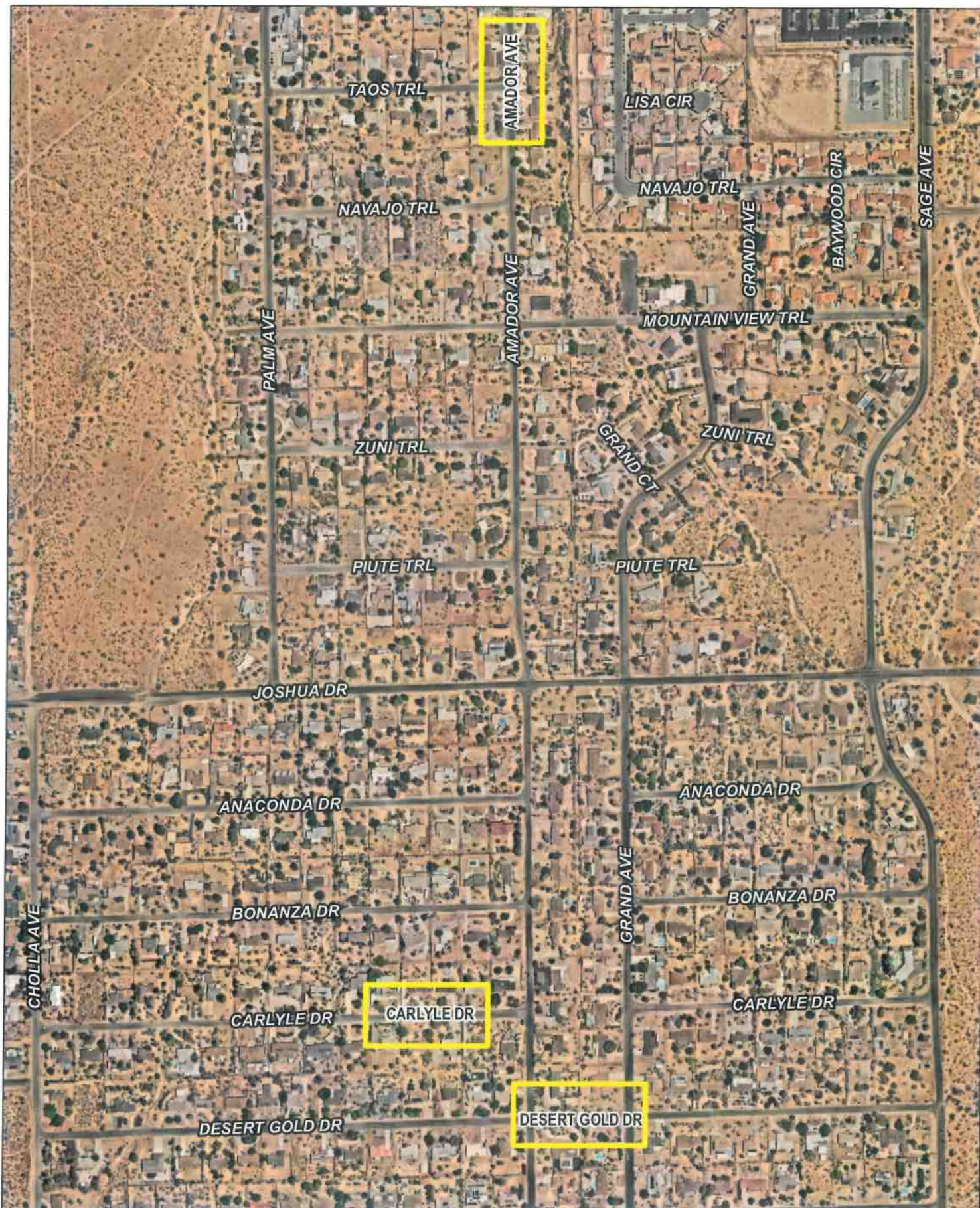
Sewer Connection Analysis



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Planning • Environmental Services • City Utility Coordination • GIS



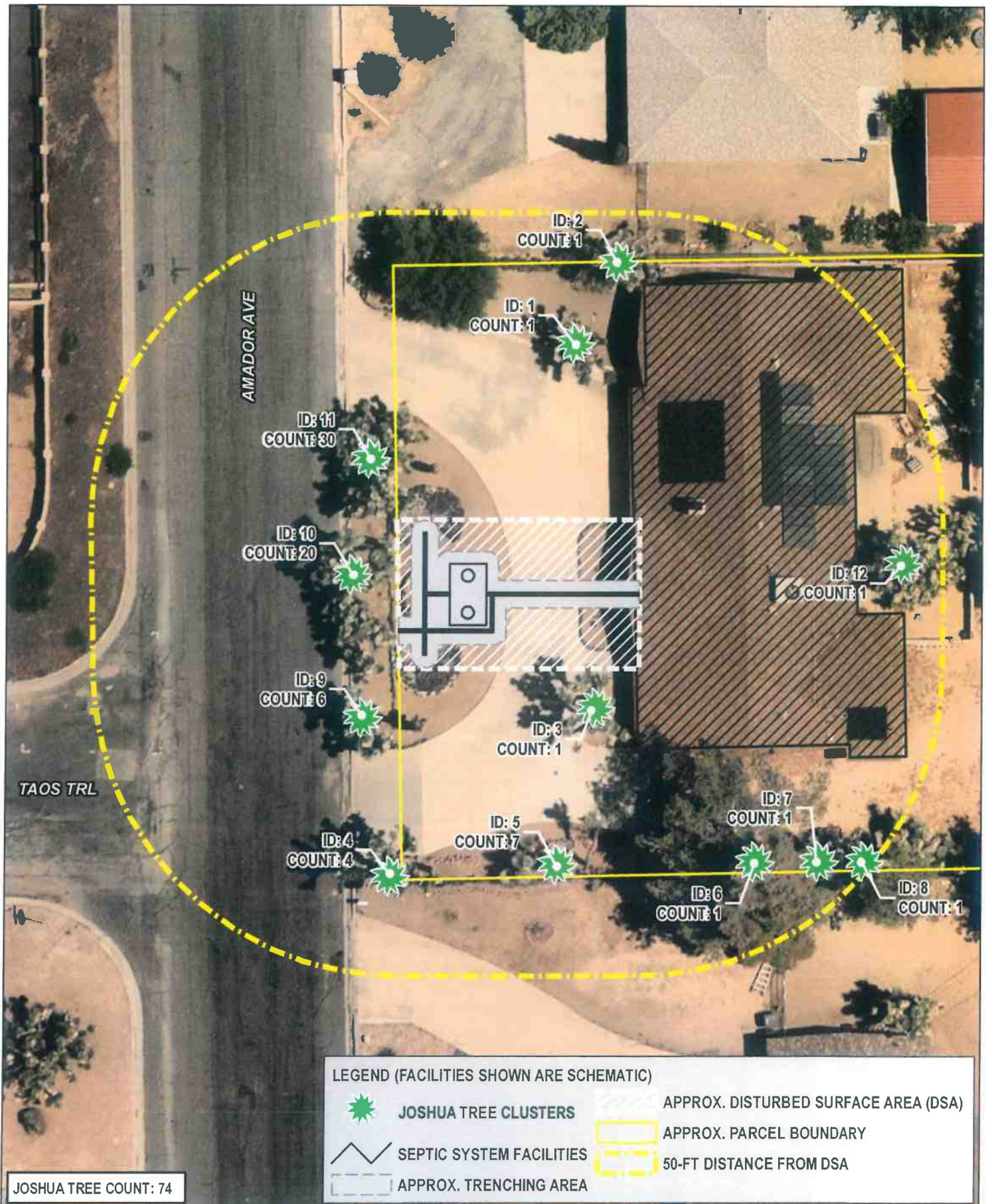
LOCATION MAP IN THE TOWN OF YUCCA VALLEY



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VICINITY MAP
IN THE TOWN OF YUCCA VALLEY



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 Planning • Environmental Services • Dry Utility Coordination • GIS



7000 BLOCK OF AMADOR AVENUE
JOSHUA TREE LOCATION ANALYSIS

7000 Block of Amador Ave Joshua Tree Survey Photographs

Contact Information

Date	1/28/2025
Times of Observation	10:00 AM
MSA Representative Name(s)	Payton Thomas, Reed Witherspoon
MSA Representative Phone Number	(760) 320-9811

Observation Summary

Western Joshua tree (WJT) counts were estimated using the most recent Nearmap aerial views, dated 2023, and in-person surveys from the public right-of-way, performed in January 2025. The Amador Ave property included an estimated 74 individual WJT within the approximate area of disturbance (50-ft from approximate disturbed surface area). Individual WJT were observed to appear in approximately 8 clusters that were visible from the right-of-way, and 4 clusters that were obscured by fencing due to growth in the backyard of the property and only observable through Nearmap aerial views. Backyard cluster counts, Cluster ID 6, 7, 8, and 12, were standardized to counts of 1 individual per cluster. Of the 74 individual WJT, at least 7 individuals were estimated to be above 5 meters in height. In reference to the provided exhibit, these individuals were observed in Cluster ID 1, ID 2, ID 3, ID 4, ID 9, and ID 10.

The estimated fee amount to be issued by CDFW for an Incidental Take Permit for this property is around \$46,700. This fee was estimated using the approximate count and height of WJT through right-of-way photography.

Cluster 1 and 2



Cluster 3 and 5



Cluster 4



Cluster 9-11



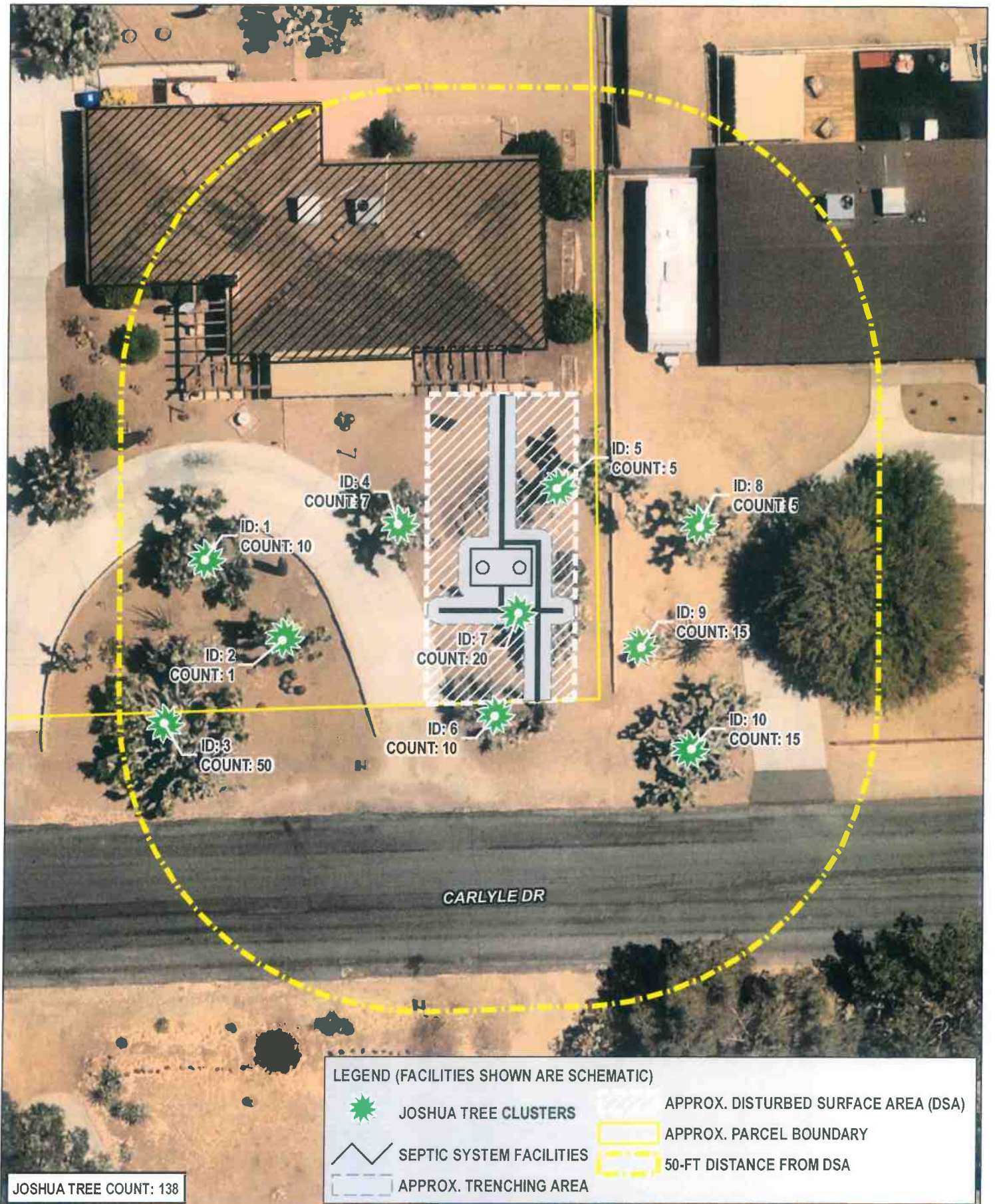
Cluster 11



Property View







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 Planning • Environmental Services • Dry Utility Coordination • GIS



56000 BLOCK OF CARLYLE DRIVE
JOSHUA TREE LOCATION ANALYSIS

56000 Block of Carlyle Dr Joshua Tree Survey Photographs

Contact Information

Date	1/28/2025
Times of Observation	9:30 AM
MSA Representative Name(s)	Payton Thomas, Reed Witherspoon
MSA Representative Phone Number	(760) 320-9811

Observation Summary

Western Joshua tree (WJT) counts were estimated using the most recent Nearmap aerial views, dated 2023, and in-person surveys from the public right-of-way, performed in January 2025. The Carlyle Dr property included an estimated 138 individual WJT within the approximate area of disturbance (50-ft from approximate disturbed surface area). Individual WJT were observed to appear in approximately 10 clusters that were visible from the right-of-way. Of the 138 individual WJT, at least 3 to 5 individuals were estimated to be above 5 meters in height. In reference to the provided exhibit, these individuals were observed in Cluster ID 3, ID 4, and ID 5. A separate species of Yucca was potentially observed in Cluster ID 6 which may exclude those counts from the total. Further analysis is required.

The estimated fee amount to be issued by CDFW for an Incidental Take Permit for this property is around \$62,900. This fee was estimated using the approximate count and height of WJT through right-of-way photography.

Cluster 1, 2, and 3





Cluster 4



Cluster 5, 6 (potentially not western joshua trees), 7, and 10



Cluster 6 (potentially not western joshua tree)



Cluster 5 and 9

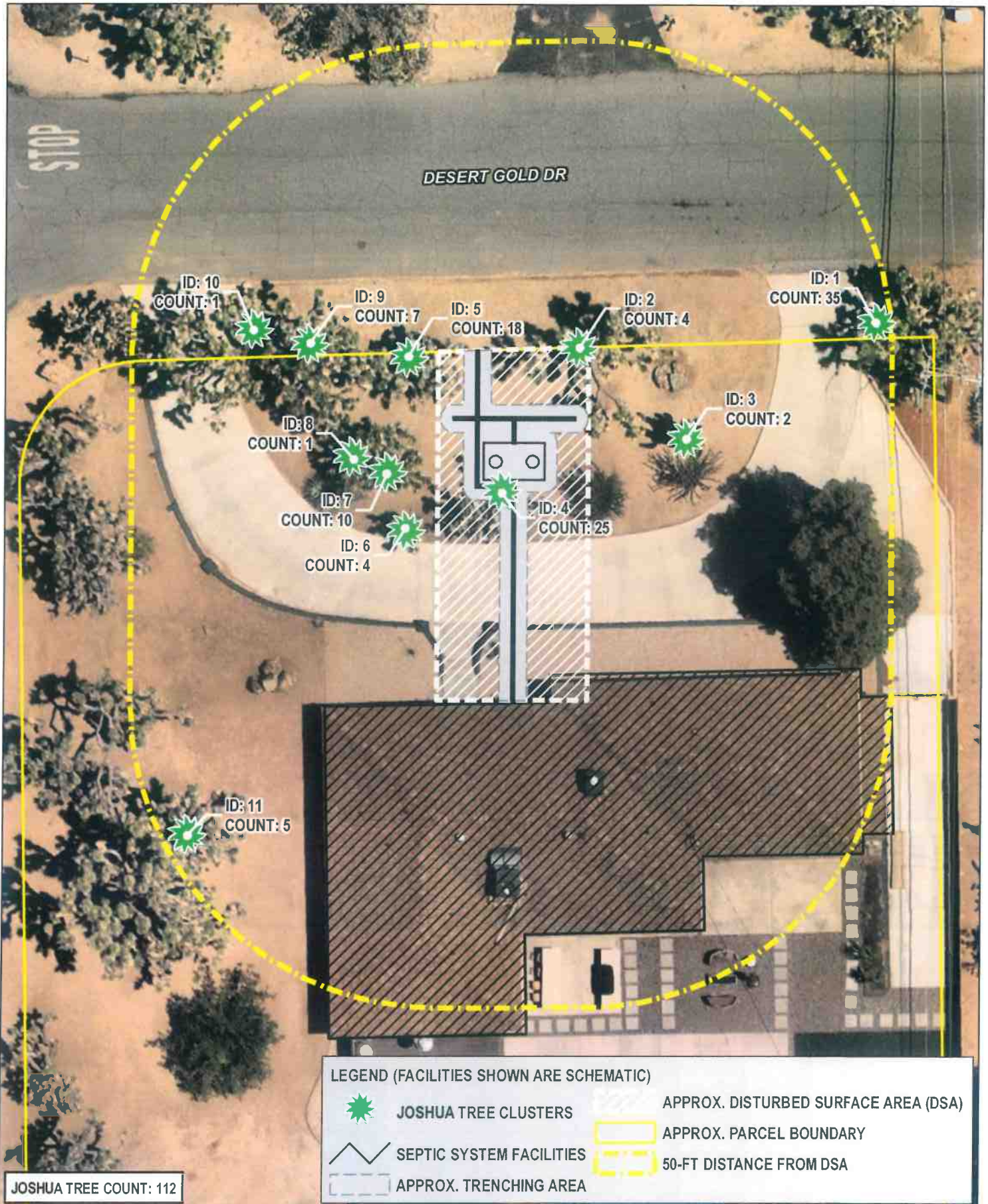


Cluster 10



Property view (from left)





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 Planning • Environmental Services • Data Utility Coordination • GIS



56000 BLOCK OF DESERT GOLD DRIVE
JOSHUA TREE LOCATION ANALYSIS

56000 Block of Desert Gold Dr Joshua Tree Survey Photographs

Contact Information	
Date	1/28/2025
Times of Observation	9:00 AM
MSA Representative Name(s)	Payton Thomas, Reed Witherspoon
MSA Representative Phone Number	(760) 320-9811

Observation Summary

Western Joshua tree (WJT) counts were estimated using the most recent Nearmap aerial views, dated 2023, and in-person surveys from the public right-of-way, performed in January 2025. The Desert Gold Dr property included an estimated 112 individual WJT within the approximate area of disturbance (50-ft from approximate disturbed surface area). Individual WJT were observed to appear in approximately 11 clusters that were visible from the right-of-way. Of the 112 individual WJT, at least 5 individuals were estimated to be above 5 meters in height. In reference to the provided exhibit, these individuals were observed in Cluster ID 1, ID 2, ID 6, ID 10, and ID 11. Cluster ID 1 and ID 11 were observed from arial photographs to grow both inside and outside of the area of disturbance. Due to homeowner privacy concerns, counts were not able to be obtained distinguishing between the two. Counts for these two clusters include total individual WJT observed in the cluster regardless of placement in the disturbance boundaries.

The estimated fee amount to be issued by CDFW for an Incidental Take Permit for this property is around \$59,200. This fee was estimated using the approximate count and height of WJT through right-of-way photography.

Cluster 1



Cluster 2



Cluster 4



Cluster 5 and 6



Cluster 7 and 8



Cluster 9 and 10



Cluster 11



Full Property



April 24, 2025

via email: fgc@fgc.ca.gov

California Fish and Game Commission
And
Charlton Bonham, Director
P.O. Box 944209
Sacramento, CA 94244-2090

Subject: Western Joshua Tree Conservation Plan Comments

Honorable Commissioners and Director Bonham:

Due to the zoom issues at the last public hearing, I was not able to provide verbal public comments on the Western Joshua Tree Conservation Plan. Therefore, I am providing an expanded version.

Permitting

First, I deeply appreciate the time staff has spent with me to discuss my permitting concerns of this plan. I find it interesting that the Commission members did not want to acknowledge that Permitting is part of the Plan. The permitting is actually the thing that separates the Plan from just a “conservation plan” and is the main issue with the “conservation plan.”

I also appreciate the Staff’s attempt to reduce the mitigation buffers as part of the requirements, and study the tolerance the species has in the urban environment. This does not go far enough. Even after the meeting, I am still hearing from homeowners that buffers are being applied for mitigation. So, I don’t know if the staff has gotten the memo yet.

The permitting portion of the Plan oversteps the only definition that is supposed to apply to permitting - “take” or “KILL.” There is no way under CESA to “hunt, pursue, catch, or capture,” or attempt to do so, to a stationary object. The “hunt, pursue, catch or capture” generally refers to a mobile species in which those actions cause emotional distress that could threatened its existence. That leaves the only portion of the definition applicable to this species, which is “kill.” How does one “kill” the western Joshua tree? Relocation does not kill a western Joshua tree. Severing roots 5 feet away for the purpose of relocation does not “kill” the western Joshua tree, so how is it that a project being implemented within 25 feet or 50 feet actually “kills” the tree? Until the CDFW knows that answer, there should be no mitigation for “root encroachment” in any sort of buffer. The only definition that needs to be applied is to “kill” which is removing the tree and not relocating it – the tree is lost forever.

Additionally, the Act specifically states, the census should be performed ON the project site. Right now, the buffers represent off the project site for “assumed kill.” And we all know what assumed means. An example of this disconnect, is how can you sever a root 5 feet from the tree to relocate

the tree and it lives, but there is an “assumed” take – kill - if you are merely working around or trenching near a root that is potentially 25 feet or 50 feet away? Everyone in the urban area with these trees knows exactly how to work around them, which is the same as minimization and avoidance. If there is no actual “kill,” there should be no mitigation.

Additionally, why are relocated trees charged under the mitigation schedule? If relocation “killed” the tree, then why would relocation be a required part of the Act? Relocation is not “kill” or it would not be an option as part of the Conservation Act. As I have stated before, I do believe there is some latitude in the Act to charge a small fee for the relocated tree, so CDFW can still get their money, but not at the “kill” rates to be charged.

Therefore, if you are only charging mitigation fees for those trees that are actually removed and not relocated, (“killed”), and only a minor “administrative” type fee for those trees that are relocated, you are staying within the intent Act – which was conservation – I believe that would greatly relieve the burden for everyone.

As an example, a single family homeowner wants to build a house or structure on his property where there are eight trees that are in the way of the structure. He proposes to relocate all eight on his property. Technically, that is not “kill.” Therefore, no mitigation fees would be charged. He still has significant expense though because he has to create a relocation plan, hire biologists, specialists – and until the CEQA compliance is resolved – pay fees for a detailed environmental document, planning director process... all that are not warranted for this kind of project except to satisfy CEQA solely for the CDFW. So the homeowner is still financially damaged by the Act, just not by the permitting portion of the Act.

CESA is very strict on permitting. At the previous commission meeting, we heard “we have never done this before” – was that supposed to mean it’s threatened, but it’s not threatened? We want to do something, but not do something too harsh? Conservation is great but treating this species as threatened under CESA has been proven not to be warranted by three independent studies to determine candidacy under CESA and the federal ESA. It was clear at the last Commission meeting that the Commissioners wanted to stay focused on conservation. Therefore, staff absolutely has the latitude to use common sense when approaching the permitting for this species.

California Environmental Quality Act Compliance

I appreciate the Director’s willingness to prepare an EIR for this. But as one homeowner stated which applies to many, they are on the clock. Homeowners and small developers already have construction loans, the infill developers have investors, they all are paying property taxes, interest, etc. An EIR can take at least 18 months. Many of the agencies, homeowners and small developers have already been waiting for the past two years. They really can’t afford to wait another two years for an EIR.

Additionally, while a CEQA EIR is not required to directly address the socioeconomic impacts of the Act, it absolutely should be addressed under the Population and Housing criteria in order to justify the buffers and fees of the permitting and the hardships that it is causing on residents, homeowners, utilities, etc. Therefore, the CDFW must conduct this analysis and prepare a Statement of Overriding Considerations that the threatened existence of this tree outweighs the harmful permitting practices

and fees. Given that there are three studies that say the tree should not be treated as threatened under CESA or federal ESA, I do not believe the CDFW can make that finding. Additionally, the EIR opens the CDFW and the Commission to a lawsuit, which could tie it up even longer.

The easiest thing to do would be for your legal counsel to make a finding that permits issued under the Western Joshua Tree Conservation Act are completely different and are **not permits under CESA**. There is no provision in CESA for the Western Joshua Tree Conservation Act. However, the Western Joshua Tree Conservation Act clearly states that a permit can be issued under CESA **OR** the Act. So clearly, there was some intent in the Act to treat this species differently when it comes to permitting.

As the Commission and the Director has said multiple times – “we are doing something that has never been done before.” So treat it as just that – different. Treat these permits as you would a Lake and Streambed Alteration Permit, it is just a permit. That way, the CEQA authority falls back to the Lead Agency. For a single family home that does not require CEQA, the Lead Agency could file a Notice of Exemption for a Ministerial Action, or “In Fill.” That way the CDFW has a CEQA document and the homeowners and small developers are not overburdened by the permitting process for a full CEQA Initial Study.

Therefore, to ease the burden on projects immediately, I respectfully suggest: 1) remove these assumed buffers until they can be proven to “kill” the species, 2) mitigation fees for only kill - meaning removing a tree and not relocating it; and 3) remand CEQA back to the discretion of the Lead Agency and allow for CEQA Exemptions. In essence – **use common sense**.

I understand that the homeowners in Yucca Valley have reached out to the Director and requested that he visit with them. I know he understands the issues, but I recommend that before the Commission takes any action to finalize this Plan, that the CDFW Director and the Commissioners visit the communities where the WJT has been protected and is prolific in the built environment, such as Yucca Valley, Landers, Flamingo Heights, Phelan, Hesperia, etc.

I believe it is important to preserve the WJT without causing an unnecessary burden on critical infrastructure and the disadvantaged and severely disadvantaged communities that live in the WJT habitat area. Thank you for your consideration. Please feel free to contact me at (909) 496-5960 if you have any questions or need more information.

Sincerely,

A handwritten signature in cursive script that reads "Julie A. Gilbert". The signature is written in dark ink and is positioned above the printed name and title.

Julie A. Gilbert
President

REED FAMILY COMPANIES

CARING FOR OUR PEOPLE, CUSTOMERS, COMMUNITIES, AND ENVIRONMENT



May 7, 2025

President Erika Zavaleta and Director Charlton Bonham

California Fish and Game Commission

715 P Street, 16th Floor

Sacramento, CA 95814

Subject: Concerns Regarding the Western Joshua Tree Conservation Plan

Dear President Miller and Director Bonham,

I am writing on behalf of Reed Family Companies (RFC) to express our concerns regarding the Western Joshua Tree Conservation Plan (Plan) and its potential impact on our operations. While we fully support the conservation of the Western Joshua Tree (WJT), we believe that certain aspects of the Plan require reconsideration to balance environmental protection with economic viability.

Inclusion of SMARA Reclamation as Avoidance and Minimization

We strongly urge the Commission to recognize the reclamation of surface mining operations under the Surface Mining and Reclamation Act (SMARA) as a valid method of achieving avoidance and minimization. Reclamation plans often include the restoration of native habitats and plants, which aligns with the conservation goals of the Plan. By making the WJT part of the reclamation plan, you ensure the site returns back to the original WJT habitat. Incorporating SMARA reclamation into avoidance and minimization strategies will ensure that mining operations contribute positively to the conservation of the Western Joshua tree while continuing to operate sustainably.

Impact of Mitigation Fees on Mining Operations

The mitigation fees outlined in the Plan pose a significant financial burden on our ability to mine our vested property. These fees, calculated based on the number and size class of the trees taken, could severely impact our economic viability and hinder our ability to access reserves. Additionally, there is a disparity in the fees being assessed between the unbounded region our Canebrake quarry is located within and the fees assessed south of us in the bounded region. We see no scientific justification or principle that would require us to pay such exorbitantly higher fees than our southern counterparts. In short, it is unfair to assess these higher fees.

AB 1008 Requirements:

Tree Size	Bounded Lower Fee Area (per tree)	Unbounded Higher Fee Areas
>5 Meters	\$1000	\$2500
<5 Meters	\$300	\$500

Not being able to mine aggregate locally would result in a significant increase in greenhouse gas emissions, as aggregate would need to be trucked into the region. Given that global warming is the leading threat to the WJT, this outcome seems counterproductive to the conservation goals of the Act. We request that the Commission consider alternative mitigation measures that do not disproportionately affect the mining industry.

Incidental Take Permits for Relocation within Avoidance Buffers

We also believe that incidental take permits should not be required when relocating a WJT within the avoidance buffer of another tree. It is clearly observable that WJTs thrive in areas where they are densely populated. Relocating trees within these buffers is a practical and effective method of minimizing impacts while ensuring the survival of the trees. Requiring incidental take permits for such relocations adds unnecessary complexity and delays to the process. We propose that the Commission streamline the permitting process for relocations within avoidance buffers to facilitate adaptive management and conservation efforts.

Opposition to Listing the Western Joshua Tree under California's Threatened and Endangered Species List

We strongly oppose the listing of the WJT under California's Threatened and Endangered Species List. The California Department of Fish and Wildlife (CDFW) conducted a comprehensive study and did not recommend the species for listing. The Western Joshua Tree Conservation Act was created to avoid the need for listing this species by implementing conservation measures. Listing the WJT as threatened or endangered would impose additional regulatory burdens and could hinder economic development without providing significant additional conservation benefits.

In conclusion, we respectfully request that the Commission consider these points and make the necessary adjustments to the Plan. By doing so, we can achieve a balanced approach that protects the WJT while supporting the economic development of our industry.

Thank you for your attention to these matters. We look forward to working collaboratively with the Commission to find solutions that benefit both conservation and economic interests.

Sincerely,

Ian Davies
Environmental Manager
Reed Family Companies

A handwritten signature in black ink, appearing to read 'I. Davies', with a stylized, flowing script.