

California Department of Fish and Wildlife  
Environmental Enhancement Fund Grant Program  
FINAL PROGRESS REPORT  
Mojave Desert Springs Habitat Protection and Restoration

**AGREEMENT #Q2175067**  
**Mojave Desert Land Trust**

Date: May 31, 2024

Project Title: Mojave Desert Springs Habitat Protection and Restoration

Agreement No.: #Q2175067

Grant Term: [October 2021 – March 2024]

Grantee: Mojave Desert Land Trust

**FISCAL REPORT**

<b>Fund Source</b>	<b>Amount Awarded</b>	<b>Total Amount Reimbursed</b>
<b>CDFW EEF Grant Funds</b>	\$252,115	<b>\$216,341.27</b>
<b>Cost Share MDLT Staff (includes benefits)</b>	Planned: \$1,800	<b>Actual: \$8,517.09</b>
<b>Cost Share Americorps</b>	Planned: \$23,960	<b>Actual: \$37,078.10</b> (1,238 hours at a rate of \$29.95/hr.)
<b>Cost Share Travel</b>	Planned: \$2,016	<b>Actual: \$2021.26</b>
<b>Cost Share Partner Engineering</b>	Planned: \$10,000	<b>Actual: \$10,887</b>
<b>Cost Share Southern Sierra Research Station</b>	Planned: \$4,543	<b>Actual: \$4,208.18</b>
<b>Cost Share Audubon Society</b>	Planned: \$3,000	<b>Actual: \$4,340</b>
<b>Cost Share BLM</b>	Planned: \$5,000	<b>Actual: \$0</b> (Some consultation was provided, but without documentation of the match amount)
<b>Cost Share Motus Units</b>	Planned: \$8,900	<b>Actual: \$9589.72</b>
<b>Cost Share, Indirect</b>	Planned: \$4,167	<b>Actual: \$20,712.07</b>
<b>Agreement Totals</b>	\$252,115 (EEF Funds) + \$63,386 (Cost Share) = \$315,501	<b>Actual: \$313,694.69</b>

## **Brief Summary of Work Performed from October 2021 – March 2024**

### **Freeman Canyon**

To kickstart this project, a comprehensive botanical survey was conducted on Freeman Canyon on multiple dates between **April and September 2022** by EREMICO Biological Services. Mojave Desert Land Trust performed an initial site visit of Freeman Canyon in **November 2022** to collect information on what areas of the property should be prioritized for restoration. Subsequent trips to Freeman Canyon to carry out project tasks took place in February 2023, March 2023, September 2023, November 2023, February 2024, and March 2024. A contractor, Friends of Jawbone, installed a smooth-wire fence to close an undesignated vehicle route entering the southern boundary of the parcel in August 2023, and visited the spring in March 2024 to install a vehicle gate to restrict access to pedestrians or authorized management vehicles only. Southern Sierra Research Station installed and continues to maintain a Motus unit and an audio recording unit (ARU) to collect avian data.

- **February 2023:** MDLT staff visited Freeman Canyon with an 8-person AmeriCorps crew. During this time, private property signs were strategically installed at points of entry and along the boundary of Freeman Canyon. A wire mesh corral was also removed and hauled away to reduce barriers to wildlife movement throughout the property.
- **March 2023:** MDLT Deputy Executive Director & Chief Conservation Officer, Cody Hanford, visited Freeman Canyon with a representative from the BLM Ridgecrest field office to discuss management issues and actions to take on shared property boundaries.
- **September 2023:** MDLT staff from the Lands Department and the Plant Conservation Department visited Freeman Canyon. MDLT had received reports from partner organizations that Ravens (*Corvus corax*) have been inhabiting remnant bird boxes and were threatening Mohave ground squirrels (*Xerospermophilus mohavensis*) on the property. During this visit, the boxes were removed, and the debris was hauled away. Additionally, more boundary signs were installed, and seeds from Yerba mansa (*Anemopsis californica*), east Mojave buckwheat (*Eriogonum fasciculatum* var. *Polifolium*) and winterfat (*Krascheninnikovia lanata*) were collected by the Plant Conservation team.
- **November 2023:** The Plant Conservation team re-visited Freeman Canyon to continue their collection efforts. The team collected seed of Cattle Saltbush (*Atriplex polycarpa*) and added it to the already existing collection of Winterfat (*Krascheninnikovia lanata*) collected in September 2023.
- **February 2024:** MDLT staff visited Freeman Canyon to continue ongoing monitoring for any land use violations and to formulate a final field work plan to wrap up the project.
- **March 2024:** MDLT staff made a final visit to Freeman Canyon with a seven-person AmeriCorps crew to carry out remaining project tasks. During this time, an undesignated route entering the property on the southern boundary was closed, and approximately 150 linear feet of disturbed land was decompacted, vertical mulched, and reseeded by incorporating seed bank duff from nearby native vegetation in holes dug for vertical mulch and scattering seed throughout the decompaction treatment area. Additionally, 350 linear feet of barbed wire fence and posts were removed from around the spring, and 450 linear feet of barbed wire fence was removed east of the spring to allow for safe, unobstructed wildlife access. A barbed wire gate was removed and replaced with a permanent segment of fence to restrict off-highway vehicular access. A lock was installed at the front gate, a pedestrian step-over was installed to limit access to foot traffic only, and an interpretive sign was installed near the spring to highlight the importance of water in the desert as a natural resource and educate recreators on how to minimize their environmental impact as they move throughout the area. Additionally, staff used the multiparameter Hanna unit

to gather water quality data on the spring.

**Tunnel Spring**

To kickstart this project, a comprehensive botanical survey was conducted on Freeman Canyon on multiple dates between **April and September 2022**, and a spring hydrological survey was conducted by Roux Associates in **July 2022**. Mojave Desert Land Trust performed an initial site visit of Tunnel Spring in **November 2022** to collect information on what areas of the property should be prioritized for restoration. Subsequent trips to Tunnel Spring to carry out project tasks took place in February 2023, September 2023, February 2024, and March 2024. Additionally, in March 2024, Friends of Jawbone installed a vehicle gate along Kelso Valley Road to restrict access to the spring to pedestrians or authorized management vehicles only, and Southern Sierra Research Station installed and continues to maintain a Motus unit that is assisting in collecting avian data.

- **February 2023:** MDLT staff visited Freeman Canyon with an 8-person AmeriCorps crew. During this time, private property signs were strategically installed at points of entry and along the boundary of Tunnel Spring, a cut fence near Piute Mountain Road was repaired, approximately 250 linear feet of undesignated off-highway vehicle routes were decompacted, vertical mulched, and reseeded by incorporating seed bank duff from nearby native vegetation in holes dug for vertical mulch and scattering seed throughout the decompaction treatment area. Additionally, over 800 linear feet of barbed wire fence and posts that surrounded the spring site and along Kelso Valley Road were removed and hauled away to allow for safe, unobstructed wildlife access to important water sources when needed.
- **September 2023:** MDLT staff from the Lands Department and the Plant Conservation Department visited Tunnel Spring. During this visit, the property was monitored on foot for any damage or violations, and additional boundary signs were installed. The Plant Conservation team collected seed from narrowleaf milkweed (*Asclepias fascicularis*), white hedgenettle (*Stachys albens*), Mojave beardtongue (*Penstemon incertus*), and Death Valley sandmat (*Euphorbia vallis-mortae*), which is a California Rare Plant (Rank: 4.2).
- **February 2024:** MDLT staff visited Tunnel Spring to continue ongoing monitoring for any land use violations and to formulate a final field work plan to wrap up the project.
- **March 2024:** MDLT staff made a final visit to Tunnel Spring with a seven-person AmeriCorps crew to carry out remaining project tasks. During this time, an undesignated route entering the property on the southern boundary, and a single-track, undesignated route that runs parallel along a fence line in the central portion of the property was closed. In total, approximately 540 linear feet of disturbed land was decompacted, vertical mulched, and reseeded. A damaged fence was repaired by MDLT staff in the northern and southern portions of the property, and a lock was installed on the vehicle gate. Additionally, staff used the multiparameter Hanna unit to gather water quality data on the spring.



### Frog Spring

To kickstart this project, a comprehensive botanical survey was conducted on Freeman Canyon on multiple dates between **April and September 2022**, and a spring hydrological survey was conducted by Roux Associates in **July 2022**. Mojave Desert Land Trust performed an initial site visit of Frog Spring in **November 2022** to collect information on what areas of the property should be prioritized for restoration. Subsequent trips to Frog Spring to carry out project tasks took place in February 2023, September 2023, February 2024, and March 2024. Additionally, in February - April 2023, Friends of Jawbone installed smooth-wire fence along designated route SC47, and in March 2024, installed a vehicle gate to restrict access to pedestrians or authorized management vehicles only, and Southern Sierra Research Station installed and continues to maintain a Motus and ARU to collect avian data.

- **February 2023:** MDLT staff visited Frog Spring with an eight-person AmeriCorps crew. During this time, private property signs were strategically installed along designated route SC47 and along the boundary of Frog Spring Canyon, invasive London rocket (*Sisymbrium irio*) was removed from near the Frog Spring water source, over 1,100 linear feet of 4-strand barbed wire fence and posts were removed and hauled away, and areas previously impacted by cattle grazing and off-highway vehicle use were decompacted, vertical mulched, and land was decompacted, vertical mulched, and reseeded by incorporating seed bank duff from nearby native vegetation in holes dug for vertical mulch and scattering seed throughout the decompaction treatment area.. Weeks following MDLT's work, Friend of Jawbone installed smooth-wire fence to ensure the property was resistant to off-highway vehicle trespass.
- **September 2023:** MDLT staff from the Lands Department and the Plant Conservation Department visited Frog Spring. During this visit, the fence line and property was monitored on foot for any damage or violations, the remaining boundary signs were installed, and a previously undocumented patch of invasive Russian thistle (*Salsola tragus*) was removed. The Plant Conservation team collected seed from Yerba mansa (*Anemopsis californica*), creeping wild rye (*Elymus triticoides*), prickly poppy (*Agremone munita*), butterweed (*Senecio flaccidus*), and coyote tobacco (*Nicotiana attenuata*). Additionally, staff used a drone to create a high-resolution orthomosaic of Frog Spring and the surrounding area.
- **February 2024:** MDLT staff visited Frog Spring to continue ongoing monitoring of the fence line for any land use violations and to formulate a final field work plan to wrap up the project.
- **March 2024:** MDLT staff made a final visit to Frog Spring to carry out remaining project tasks. During this time, the area previously restored in February 2023 was monitored using a point-line intercept method to measure restoration success by calculating ground cover. Sites that had previous invasive removal were monitored for follow-up removal needs. Russian thistle was not present, deeming follow-up removal not necessary. A follow-up removal of London rocket was needed and carried out by MDLT staff. A lock was installed on the vehicle gate, a pedestrian step-over was installed to limit access to foot traffic only, and interpretive sign was installed near the gate and designated parking area to highlight the importance of water in the desert as a natural resource and educate recreators on how to minimize their environmental impact as they move throughout the area. Additionally, staff used the multiparameter Hanna unit to gather water quality data on the spring and used a drone to create a high-resolution orthomosaic of Frog Spring and surrounding area. This image can be compared to the one created in 2023 to compare changes in vegetation following fencing and restoration actions.

### Bird Spring

To kickstart this project, a comprehensive botanical survey was conducted on Freeman Canyon on multiple dates between **April and September 2022**, and a spring hydrological survey was conducted by Roux Associates in **July 2022**. Mojave Desert Land Trust performed an initial site visit of Bird Spring in **November 2022** to collect information on what areas of the property should be prioritized for restoration. During this visit, MDLT staff noted an abundance of surface artifacts including lithic reductions, projectile points, and bedrock mortars within the property, with a high concentration of the surface artifacts occurring around the spring sites. Correspondence and coordination with the BLM Ridgecrest Field Office provided insight and next steps for work at the site, and MDLT was informed that because the site is rich in cultural artifacts and history, additional cultural surveys and assessments would be required before any ground-disturbing restoration or debris removal could occur. Subsequent trips to Bird Spring to carry out project tasks took place in March 2023, September 2023, November 2023, February 2024, and March 2024.

- **March 2023:** MDLT Natural Resource Director, Cody Hanford, visited Freeman Canyon with a representative from the BLM Ridgecrest field office to discuss management issues and actions to take on shared property boundaries.
- **September 2023:** MDLT staff from the Lands Department and the Plant Conservation Department visited Bird Spring. During this visit, boundary signs were installed along BLM route SC47 to deter off-highway vehicle travel into Bird Spring, and seeds from cotton thorn (*Tetradymia axillaris*) and calabazilla (*Cucurbita foetidissima*) were collected by the Plant Conservation team.
- **November 2023:** MDLT staff performed a cultural survey at Bird Spring. The survey was conducted on APN 096-11-003, totaling 80 acres. Transects were laid out at 10-meter intervals, and the ground was systematically inspected on foot. Every isolate and historic feature was recorded to create the density and boundary of historic and prehistoric features and isolates on the property. The qualification of these sites as "historic properties," "historical resources," and/or "tribal cultural resources" cannot be determined without further historical and/or archaeological investigations; however, the survey guided staff on areas of avoidance for any future restoration work.
- **February 2024:** MDLT staff visited Bird Spring to continue ongoing monitoring for any land use violations and to formulate a final field work plan to wrap up the project.
- **March 2024:** MDLT staff made a final visit to Bird Spring with a seven-person AmeriCorps crew to carry out remaining project tasks. Using information in the cultural report, staff could target sites in need of restoration while remaining clear of culturally sensitive areas. Approximately 380 linear feet of undesignated off-highway vehicle routes that spur off BLM route SC47 were blocked, decompacted, vertical mulched, and reseeded by incorporating seed bank duff from nearby native vegetation in holes dug for vertical mulch and scattering seed throughout the decompaction treatment area. In addition, a temporary wire gate on the eastern boundary was reinforced. These actions have restricted vehicular access into the property, limiting access to pedestrian traffic only and protecting the ecologically and culturally sensitive area from further impacts. Strategic barbed wire removal was also conducted on Bird Spring. To avoid ground disturbance, fence posts were left in place. Removal of 640 linear feet of barbed wire fence occurred west of the main corral, and 70 linear feet removed from around the spring and trough. The removal of this barbed wire has created an opportunity for wildlife to safely move throughout the property and access important water sources when needed. Additionally, staff used the multiparameter Hanna unit to gather water quality data on the spring and used a drone to create a high-resolution orthomosaic of Frog Spring and surrounding area.

**Mustang Spring**

To kickstart this project, a comprehensive botanical survey was conducted on Freeman Canyon on multiple dates between **April and September 2022**, and a spring hydrological survey was conducted by Roux Associates in **July 2022**. Mojave Desert Land Trust performed an initial site visit of Mustang Spring in **November 2022** to collect information on what areas of the property should be prioritized for restoration. Staff determined that aside from the installation of boundary signage, educational signage, and minor work to be completed by Friends of Jawbone, land use violations were minimal, and wildlife access to the spring was unobstructed. Subsequent trips to Mustang Spring to carry out project tasks took place in September 2023, and March 2024.

- **November 2023:** MDLT field staff visited Mustang Spring. The property was monitored on foot for any land use violations, and property signs were strategically installed at designated entry points and along the property boundary. Additionally, staff used a drone to create a high-resolution orthomosaic of Mustang Spring and surrounding area.
- **March 2024:** MDLT field staff made a final visit to Mustang Spring to carry out remaining project tasks. During this visit, the interpretive sign was installed near the spring at a designated parking area to highlight the importance of water in the desert as a natural resource and educate recreators on how to minimize their environmental impact as they move throughout the area.

### **Project Benefits and Results:**

The completion of this project has yielded significant benefits and impactful results, achieving the primary goals of protecting spring sites and associated habitat from human disturbances, enhancing spring sites for wildlife use, collecting ecological data that to help inform future management actions, and promoting public awareness of the ecological importance of these spring sites through educational signage and free, easily accessible online content.

One of the most notable results of this project was halting off-highway vehicle (OHV) access to the sites and limiting access to pedestrian foot traffic or authorized management vehicles only. The impact of undesignated OHV travel on a fragile desert ecosystem is substantial, and with the use of a variety of methods including vertical mulching, soil decompaction, signage, and selective installation of fencing and barriers, MDLT successfully closed and restored approximately 1,320 linear feet of undesignated OHV routes and approximately 1.5 acres of disturbed land that was degraded from past cattle grazing. Although there has only been a single season of observation of these sites post-restoration, there have been visual results of the disturbed areas regenerating with native flora following vertical mulching and fence installation activities.

Another notable benefit of this project was the collection and banking of native seed, with many of the collections being new additions to MDLT's Mojave Desert Seed Bank. This work is critical for biodiversity. The goal of the seed bank is to safeguard the diverse flora of the Mojave Desert against threats of climate change, habitat loss, and extinction. See **Appendix A** for a comprehensive list of species collected during the project performance period.

Baseline surveys conducted at the beginning of the project period were beneficial, as they empowered MDLT to make informed land management and restoration decisions that were both practical and had a high impact. The baseline surveys also contributed to a larger body of public science and data for ecological and land management purposes. The hydrological survey results were later incorporated into a larger report and database of spring sites within the California Desert. The botanical surveys revealed important occurrences of rare and important plants. The Motus unit work for avian species has provided very important data contributing to a greater understanding of migratory bird activity in Western North America. The cultural survey completed on Bird Spring gave MDLT the opportunity to gain a greater understanding of the area's cultural significance.

### **Estimated Co-benefits achieved to date:**

One of the most notable co-benefits achieved as a result of this project is that wildlife accessibility to essential water sources is now safe and unrestricted, as all barbed wire inhibiting free movement throughout the area has been removed. During the project performance period, MDLT strategically removed and hauled away approximately 3,410 linear feet of 4-strand barbed wire fence and posts, restoring connectivity a creating an environment where wildlife that rely on the springs as a resource can access the sites safely without the risk of injury or death.

Through this grant project, MDLT was able to make or improve important partner connections in this region. Through initial contact with biological consulting firm, EREMICO, MDLT was able to host Mohave ground squirrel (MGS) camera bait traps on two of the spring sites, thus contributing important information for MGS conservation. MDLT even offered to host a field workshop at Freeman Canyon for the MGS Conservation Council's Spring Technical Advisory Committee. Work with Southern Sierra Research Station led to additional Motus units being installed in the region, including one on another MDLT property, Caliente Creek. MDLT's work with Kern Valley Audubon helped establish conservation

connections with tribal groups in the region and ultimately helped establish connections for the Native American Land Conservancy and MDLT to successfully acquire additional important lands within the Kelso Creek watershed for permanent conservation.

### **Summarize Benefits to Disadvantaged Communities (if applicable):**

The project area is located in a rural and sparsely populated region in Kern County, California. A community needs assessment for Kern County highlighted the following themes specific to underserved populations in the region: “Social and health inequities exist across a number of dimensions including class, gender, race/ ethnicity and immigration/documentation status, but are compounded when these dimensions intersect. Inequities are starkest for groups that face multiple forms of disadvantage. These groups are more vulnerable to social and environmental burdens and have access to fewer resources.”

MDLT believes this desert landscape has transformative power, and that everyone deserves to access and enjoy it respectfully. Kern County residents who visit these public lands will benefit from the interpretive signage installed during this project performance period, as well as benefiting from exposure to the dynamics of restoration ecology, and all the positive aspects of outdoor recreation uses that are consistent with BLM policies and conservation goals on public lands and appropriate on MDLT private lands.

MDLT used its communication channels and media relationships to reach stakeholders near the project area, with a focus on diverse and underrepresented communities to encourage these community members to engage with MDLT. During the project period, MDLT collaborated interdepartmentally to publish an ArcGIS story map that showcases the Desert Springs properties, their ecological and cultural significance, and what has been done to restore and protect them. This information is easily accessible at no cost to the public.

MDLT provided opportunities for underserved youth to get involved with the project through the hiring of the AmeriCorps crew. AmeriCorps has identified underserved communities as a key focus of their efforts to recruit and retain a diverse corps, increasing representation by providing greater access to national service opportunities and benefits for people from underserved communities.

### Objectives

Description	Status	Notes (if applicable)
<b>Task 1 – Project Management and Administration:</b> Grantee will provide technical and administrative services associated with performing and completing the work for this Project, including managing this Agreement, assuring all permits are finalized, administering subcontracts, invoicing and payments, drafting and finalizing progress reports and final reports.	Complete	
<b>Task 2 – Baseline Surveys:</b> The Grantee will conduct baseline surveys and monitoring of spring conditions, surface waters, native plants, and avifauna, and subsequent trend monitoring to better understand them, track trends, and for purposes of adaptive management.	Complete	See Baseline Monitoring Report
<b>Task 3 – Invasive Plant Removal and Management:</b> The Grantee will manually remove non-native grasses and will continue to manage the removal sites.	Complete	See Final Report Photo Exhibit
<b>Task 4 – Fencing and Signage:</b> The Grantee will selectively fence areas to prevent OHV and cattle trespass. Educational signage and pedestrian gates will be installed for the public. Fences will also be removed and/or modified to enable wildlife safe and better access.	Complete	See Final Report Photo Exhibit
<b>Task 5 – Restoration:</b> The Grantee will plant cuttings and seeding, i.e., salt grass, to restore and increase riparian habitat. Restoration efforts to restore denuded upland and riparian areas (e.g., de-compaction, mulching, seeding, planting) will result in vegetation densities and composition consistent with adjacent non-disturbed areas and will create conditions that promote natural recruitment of vegetation and healthy habitat for avifauna and other wildlife. Invasive plant species will be managed and removed. The Grantee will also de-compact soils, mulch and seed user created trails and past cattle corral areas to restore habitat adjacent to waters of the state.	Complete but with changes to methodology	See Issues and Lessons Learned
<b>Task 6 – Ongoing Maintenance:</b> The Grantee will continue to conduct any necessary maintenance as needed to promote project success, including fence repairs, invasive species removal, signage replacement, supplemental mulching, seeding, and planting to achieve revegetation goal of 25% by year three of upland areas and 75% by year three of riparian areas.	Complete	Ongoing maintenance will persist during annual monitoring visits after the project.
<b>Task 7 – Monitoring:</b> Seasonal monitoring will be conducted to evaluate surface water flow, vegetation recovery, and avifauna diversity for three years following restoration actions to track project success.	Ongoing	Ongoing monitoring scheduled to extend for three years past the end of the performance period for the grant.

## **Issues and Lessons Learned**

Throughout the course of the project performance period, several issues arose that impacted our progress and required adaptive management. The unexpected change in the end date of the performance period, requested by the grant program officer due to changes in the State's budget considerations for the source of the grant funds, effectively cut MDLT's final spring field season short by two months, requiring us to reprioritize which field activities would be reasonable to complete with the remaining limited time.

Another challenge MDLT faced was barriers to performing work on culturally sensitive sites, requiring additional surveys and clearances before any ground disturbing work could be completed. This experience highlighted the importance of early engagement with tribal members and agency archaeologists to navigate such challenges timelier and more effectively.

The original restoration methodology involved the establishment of willow cuttings and thorough native plant propagation, but later field assessments indicated that these actions would not be practical or efficient, considering the watering requirements for out-planting over the first two to three years. To adjust accordingly, MDLT pivoted to incorporating seed bank duff from native vegetation near restoration sites and placed in holes that were dug for vertical mulching. This method proved to be successful, as some sites that were restored using this technique in February 2023 were showing visual signs of new growth in March 2024.

Our reliance on contractor partners was an important aspect of this project, but competing priorities and existing grants for similar work made it more difficult to coordinate work in the field. Friends of Jawbone utilized a CalOHV Green-sticker grant to conduct similar fencing and restoration in this region and completed fencing work under that grant which MDLT had planned and budgeted for in this current grant. Likewise, Southern Sierra Research Station was very busy conducting field work and establishing Motus units for CDFW projects and seemed to deprioritize our project agreement work to be completed in a timely manner during 2021 and 2022. Additionally, the BLM Ridgecrest field office was unable to contribute as much as anticipated, particularly in terms of technical guidance, support, and collaboration on debris removal and route closures. This experience highlights the importance of thorough and persistent engagement with partners to align efforts and clarify roles early and often.

Working with AmeriCorps teams presented challenges as well. The work skills and team productivity were not as good as AmeriCorps teams MDLT has hosted in previous seasons, thus requiring much closer supervision, guidance, and consistent reassurance than MDLT had anticipated. The true cost of their involvement also exceeded MDLT's initial expectations and budgeted resources. This experience highlighted the necessity of obtaining a larger pool of contractors and conservation crews who are more specialized and acclimated to working in desert environments.

Overall, these experiences have provided valuable insights into the complexities of managing a multifaceted conservation project. Moving forward, MDLT will incorporate these lessons to improve planning, communication, and collaboration, ensuring greater efficiency and effectiveness.

## **Conclusion**

The completion of this project marks an advancement in reaching MDLT's mission to protect the Mojave Desert ecosystems and its natural, scenic, and cultural resources. With support provided by the California

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Department of Fish and Wildlife Office of Spill Prevention and Response, MDLT has made substantial progress in protecting and enhancing riparian area spring sites, intermittent streams and desert scrub habitat in the driest desert in North America.

These riparian and desert scrub habitat improvements will benefit wildlife including mule deer, mountain lion, and resident and neotropical migratory birds that depend on these springs as steppingstone habitat as they migrate between wintering habitat and summer breeding grounds. Specifically, we expect that the 1,320 linear feet of restored OHV trespass routes and the 1.5 acres of former grazed land will continue to recover to a vegetation density similar to that of the adjacent non-disturbed areas of comparable composition. We expect that the targeted barbed wire removal will allow wildlife to safely access the spring sites, the arid land restoration techniques (soil decompaction, reseeding, and vertical mulching) will help native vegetation recover, and the fencing/signage installation will greatly reduce habitat degradation impacts from OHV and stray cattle. These overall actions benefit special status species such as Mohave ground squirrel, Mojave desert tortoise, and yellow-billed cuckoo, as well as the overall biodiversity of this desert region. While some of these actions do not yield instant results, and the benefits develop over many seasons, MDLT will continue to monitor and document the impact of active restoration on water quality and overall ecosystem health in future visits.



## Appendix A: Seed Collection Statistics

Species	Location	Date collected	Amount
Cucurbita foetidissima **	Bird Spring	9/22/2023 11/9/23	3 lbs 13.5 oz
Eriogonum fasciculatum var. polifolium	Bird Spring	11/9/2023	3 lbs 8.7 oz
Tetradymia axillaris	Bird Spring	9/22/2023	0.60 oz
Anemopsis californica	Freeman Canyon Spring	9/20/2023	4.5 oz
Eriogonum fasciculatum var. polifolium	Freeman Canyon Spring	9/20/2023	2lbs 10.7 oz
Krascheninnikovia lanata	Freeman Canyon Spring	9/20/2023, 11/8/2023	3.2 oz
Lessingia glandulifera **	Freeman Canyon Spring	9/21/2023	0.014 oz
Atriplex polycarpa	Freeman Canyon	11/7/23 - 11/8/23	34 lbs 6.5oz
Anemopsis californica	Frog Spring	9/21/2023	3.35 oz
Argemone munita	Frog Spring	9/21/2023	4.55 oz
Elymus triticoides **	Frog Spring	9/21/2023	0.15 oz
Nicotiana attenuata	Frog Spring	9/21/2023	0.0054 oz
Senecio flaccidus **	Frog Spring	9/21/2023	0.05 oz
Asclepias fascicularis **	Tunnel Spring	9/21/2023	0.15 oz
Euphorbia vallis-mortae **	Tunnel Spring	9/21/2023	0.0018 oz
Nicotiana attenuata	Tunnel Spring	9/21/2023	0.39 oz
Penstemon incertus	Tunnel Spring	9/21/2023	0.95 oz
Stachys albens **	Tunnel Spring	9/21/2023	0.02 oz

\*\* - Species new to the Mojave Desert Land Trust Seed Bank

## Appendix B: Photo Exhibit

Tunnel Spring

*January 2023 – March 2023*



Before – Undesignated, single track OHV route travelling into Tunnel Springs property from Piute Mountain Rd.



After – Route closed, vertical mulched, and sign installed.





Before – Posted closed route with evidence of recent use.



After – Route de-compacted and vertical mulched.





Before – Cut smooth-wire fence and OHV trespass leading to Tunnel Springs.



After – Fence repaired, and reflectors installed.





Before – AmeriCorps member working on removing barbed wire near Tunnel Spring water source.



After – Wire removed, allowing safe passage and use for wildlife.





Before – Crew working on removing barbed wire fence and posts near Tunnel Spring water source.



After – Fence removed.



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*January 2024 – March 2024*



Before – Undesignated route in the southern portion of Tunnel Springs that leads towards springs site.



After – Disturbance area restored.



Frog Spring  
*January 2023 – March 2023*



Before – Western barbed wire fence boundary.



After – Barbed wire fence and posts removed, allowing for safe passage and use for wildlife.





Before – Denuded, northeast corner of old fence and corral.



After – Disturbance area decompacted and vertical mulched to discourage unauthorized vehicle access.





Before – Northern barbed wire fence boundary.



After – Barbed wire fence and posts removed.





Before – Northwest corner of fence.



After – Fence removed, area vertical mulched, and sign installed.





AmeriCorps crew members removing invasive mustard near Frog Spring source.

*July 2023 – September 2023*



Restoration site near northeast corner of Frog Spring showing signs of regeneration approximately 7 months after





Before – patch of Russian thistle (*Salsola tragus*) on Frog Spring property.



After – Russian thistle removed.





The northern barbed wire fence boundary removed and replaced with smooth-wire fence by Friends of Jawbone.





Before – Invasive London rocket (*Sisymbrium irio*) located near the water source of Frog Spring.



After – *Sisymbrium irio* removed.





Before – *Sisymbrium irio* located near the water source of Frog Spring.



After – *Sisymbrium irio* removed.





Educational panel, locked vehicle gate, pedestrian step over and “Pedestrian Traffic Only” boundary sign installed at the entrance of Frog Spring.

**Freeman Canyon**  
*January 2023 – March 2023*



Before – Old enclosure with 4-inch square wire fence.



After – Enclosure removed, restoring connectivity.



July 2023 – September 2023



Western goldenrod (*Euthamia occidentalis*) specimen being pressed on Freeman Canyon.



Three unmaintained bird boxes that became inhabited by ravens (*Corvus corax*) are now removed.





Before – water trough at Freeman Canyon that is fed by spring covered in algae.



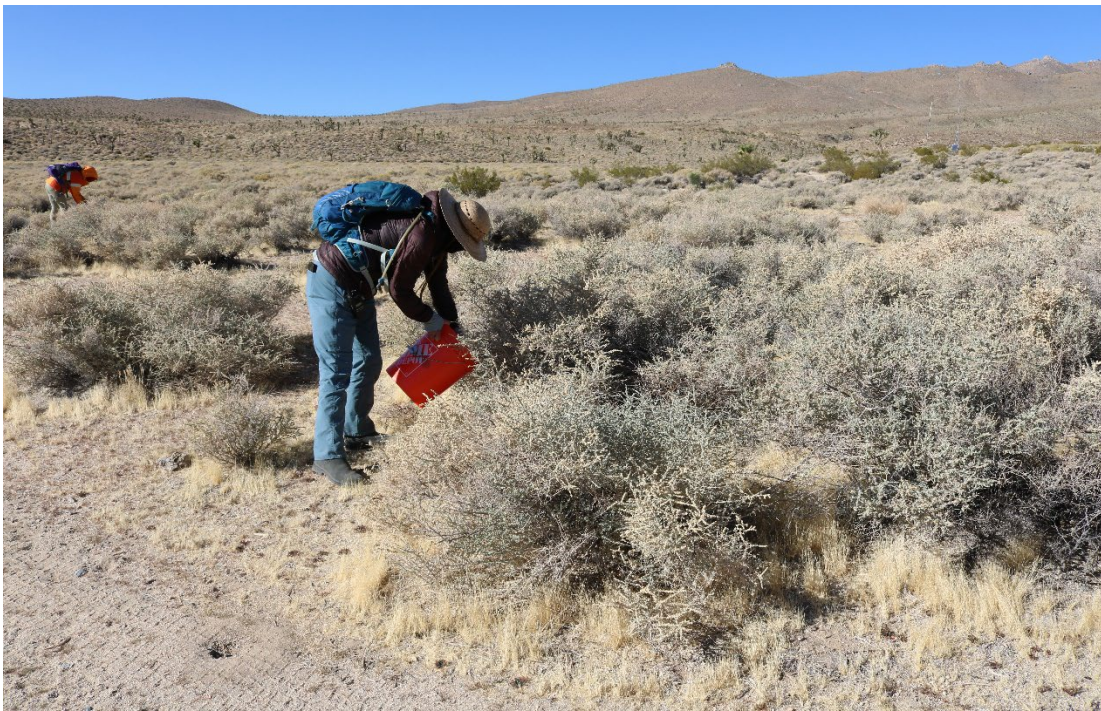
After – algae removed. Trough will continue to be monitored and cleaned as necessary.





Boundary sign installed on Freeman Canyon property.

*October 2023 – December 2023*

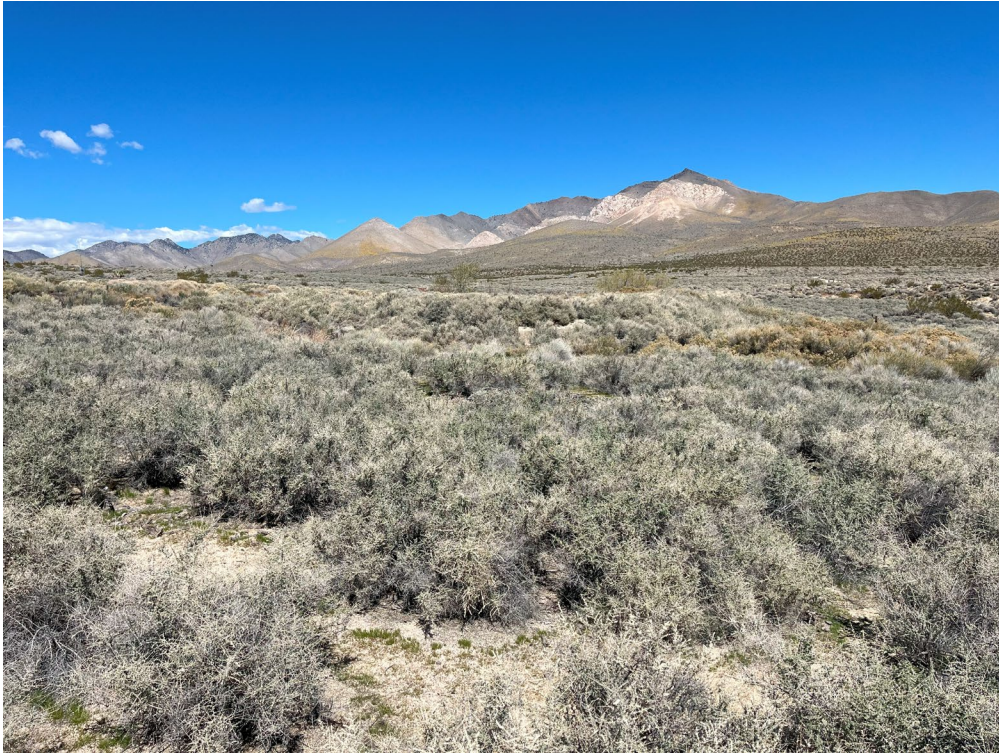


Madena Asbell collecting Cattle saltbush (*Atriplex polycarpa*) at Freeman Canyon.



**AGREEMENT #Q2175067**  
**Mojave Desert Land Trust**

*January 2024 – March 2024*



Before installation of educational panel on Freeman Canyon.



After – Panel installed.





Before – The locked front gate at Freeman Canyon did not allow for pedestrian access.



After – Existing fence retrofitted to create step over and “Pedestrian Traffic Only” sign installed.





Before – Barbed wire fence around Freeman Canyon Spring.



After – Barbed wire removed to allow for safe wildlife movement and access.





Before – A damaged cowboy gate allowed for unrestricted off-highway vehicle access into Freeman Canyon.



After – Cowboy gate removed and permanent, smooth wire fencing with Wedge-Loc diagonal braces installed.





Before – An undesignated, unrestored route recently fenced by Friends of Jawbone to restrict vehicle access into Freeman Canyon from the southern boundary.



After. Disturbance area restored.



## **Bird Spring**

*January 2024 – March 2024*



Before – Heavily compacted and eroded undesignated off-highway vehicle route leading to Bird Spring on the western boundary of the property.



After – Disturbance area de-compacted and restored.





Before – Beginning of undesigned off-highway vehicle on western boundary of Bird Spring.



After – Disturbance area restored.





Before – Eroded and heavily compacted undesignated off-highway vehicle route leading to Bird Spring near the southwest corner of the property.



After – Disturbance area de-compacted and restored with erosion control.





Before – Barbed wire fence around Bird Spring water source in corral.



After – Barbed wire removed for safe wildlife access to water. Posts left in place to minimize ground disturbance.





Before – Barbed wire fence running east-west through Bird Spring property.



After – Barbed wire removed for safe wildlife access to water sources located south of corral. Posts left in place to minimize ground disturbance.



## Mustang Spring

July 2023 – September 2023



Boundary sign installed on the northern boundary of Mustang Spring property.



A second boundary sign installed along a designated, single-track BLM route on Mustang Spring property.



*January 2024 – March 2024*



Before educational panel installation at Mustang Spring near spring source.



After. Panel installed.