IMPLEMENTATION PLAN AND BUDGET

2021-2023

Final Report – December 2020

MOJAVEMAX.COM

desert conservation PROGRAM

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LIST OF ATTACHMENTS

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INTRODUCTION

The Clark County Desert Conservation Program manages Endangered Species Act compliance on behalf of Clark County and the cities of Boulder City, Henderson, Las Vegas, North Las Vegas, Mesquite and the Nevada Department of Transportation (collectively, the Permittees) through implementation of the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and associated Section 10(a)(1)(B) incidental take permit (Permit Number TE 034927-0). Clark County serves as the implementing agent on behalf of the Permittees and the Desert Conservation Program is the Plan Administrator for the MSHCP.

The Clark County MSHCP and associated incidental take permit allow private landowners to develop land in Clark County without the need for individual project-by-project consultations and negotiation with the U.S. Fish and Wildlife Service to comply with the Endangered Species Act. This permit provides a streamlined process for compliance with the Endangered Species Act by private landowners.

In exchange for the regional permit, the Desert Conservation Program implements conservation measures that mitigate impacts to covered species resulting from private-land development activities. Categories and examples of conservation measures are described in the MSHCP and associated incidental take permit and include such activities as research, public information, education and outreach, species inventory and monitoring, habitat enhancement and restoration, the Wild Desert Tortoise Assistance Line, installation and maintenance of fencing along roadways to reduce tortoise mortality, law enforcement within the reserve system, and acquisition of additional reserve system lands to increase or preserve habitat connectivity and promote ecological resiliency.

The MSHCP provides guidance on developing biennial budgets for implementation. This report describes the process followed to develop the 2021-2023 Implementation Plan and Budget for the Clark County MSHCP and the outcome of the budget deliberations.

MSHCP IMPLEMENTATION PLAN AND BUDGET PROCESS

Per section 2.8.3.3 of the MSHCP, Clark County is responsible for providing management and administration of the MSHCP through a Plan Administrator. Per the MSHCP, the County Manager will appoint a Plan Administrator to implement the MSHCP on behalf of the Permittees. The Director of the Clark County Department of Environment and Sustainability currently serves as the Plan Administrator and manages the Desert Conservation Program.

In general, the Plan Administrator is responsible for day-to-day operations, the preparation and implementation of a biennial Implementation Plan and Budget, compliance monitoring and reporting, and making recommendations to the Clark County Board of County Commissioners, which has final decision-making authority over implementation of the MSHCP.

Guidance for the development of biennial implementation plans and budgets can be found in Section 2.1.12 of the MSHCP. Generally, it prescribes key provisions of the budget development process, which include:

- Developing the biennial calendar outlining explicit steps, dates, and responsible parties
- Calculation of available funding
- Adaptive Management Program recommendations

- Ensuring biennium proposals are developed
- Holding budget sessions
- Submittal of the Implementation Plan and Budget
- U.S. Fish and Wildlife Service review of the Implementation Plan and Budget
- Presenting the Implementation Plan and Budget to the Board of County Commissioners for approval or disapproval

Since inception of the MSHCP, the prescriptive calendar and budget process outlined in Section 2.1.12 have served as general guidance to the parties. However, the Implementation Plan and Budget process has continued to evolve over the years based on recommendations from the Adaptive Management Program, advisory committees, and a Program Management Analysis (Kirchoff 2005). Necessary adjustments have been made to arrive at implementation plans and budgets, all of which have been approved by the U.S. Fish and Wildlife Service.

The Plan Administrator has identified the budget process as an area of the MSHCP requiring significant revision and thus has been working with the U.S. Fish and Wildlife Service on a major amendment to the MSHCP. In the short-term, and in order to continue to mitigate for incidental take in good faith, the Plan Administrator proposed a budget process responsive to the key provisions outlined in the MSHCP for the 2011-2013 budget process. This same process continues to be used today to develop the 2021-2023 Implementation Plan and Budget.

BUDGET PROCESS CLARIFICATION

Among the MSHCP's guidance documents, the Implementing Agreement is the controlling document over the other documents. The Implementing Agreement states that through June 30, 2005, the Plan Administrator shall expend $2.05 million per year. During the remaining term of the permit, the Plan Administrator shall expend $1.75 million per year including cost of living adjustments of no more than 4 percent per year. The minimum required expenditure over the entire 30-year permit is $54,300,000 (February 1, 2001 through February 1, 2031).

Pursuant to the Implementing Agreement, if the Plan Administrator expends more than is required, the excess amount will be credited against future required expenditures. It is the Plan Administrator's position that all funds that have been allocated through the Implementation Plan and Budget process each biennium, and expended by the Plan Administrator for MSHCP projects, are to be included in the amount of required and excess expenditures.

By the end of the 2007-2009 biennium (June 30, 2009), the Permittees had expended more than $57 million and had met the MSHCP's minimum required expenditure. Therefore, in March 2010, the Plan Administrator sought to clarify the language in the MSHCP and Implementing Agreement with the following statement:

> In the event the County's actual expenditures exceed the total minimum required expenditure over the 30-year term of the permit prior to the end of the permit term, the County must expend any remaining funds in cooperation with the [U.S. Fish and Wildlife Service] for the conservation of species and habitats.

This statement makes clear that the budget process outlined in the MSHCP and Implementing Agreement is not necessary when determining how to expend remaining mitigation funds once the minimum required expenditure has been met. Instead, the Plan Administrator, in cooperation with the U.S. Fish and Wildlife Service, will

determine the conservation measures to be funded and implemented. The Plan Administrator received formal concurrence from the U.S. Fish and Wildlife Service on this clarification on April 14, 2010.

FUNDING

SECTION 10 FUNDS

Funding to implement the permit conditions and conservation actions in the MSHCP is primarily derived from the $550 per-acre mitigation fee (also referred to as Section 10 funding) collected by the Permittees. This funding is enterprise funding and can only be used for the purposes of implementing the MSHCP.

SOUTHERN NEVADA PUBLIC LAND MANAGEMENT ACT FUNDS

Additional funding is available from the sale of federal land in Clark County as authorized by the Southern Nevada Public Land Management Act (SNPLMA) of 1998, as amended. This funding is awarded on a competitive basis and is not guaranteed. The Bureau of Land Management (BLM) administers the SNPLMA funding program and calls for project nominations approximately every 2 years, with each call for nominations referred to as a "SNPLMA Round". Seventeen rounds of nominated projects have been funded to date with Round 18 currently in progress at the time of this writing.

Project concepts were initially developed for submittal as Round 18 nominations in the 2019-2021 Implementation Plan and Budget; however, BLM did not release the call for nominations in fall 2018 as anticipated, waiting instead until July 2020 to call for Round 18 nominations. Some conservation needs have changed since the original project concepts were developed, thus the projects included in this 2021-2023 Implementation Plan and Budget are intended to replace those concepts included in the 2019-2021 Implementation Plan and Budget. The Round 18 call for nominations was published on July 16, 2020 and nominations were accepted through September 14, 2020. The Desert Conservation Program submitted three nominations under the MSHCP category totaling $8,690,500.00. The SNPLMA Executive Committee will meet later this year to compile final funding recommendations for Round 18. The projects that were nominated for funding under Round 18 include:

- SR159 Fencing, $1,149,500.00
- Rainbow Gardens Conservation, $3,878,000.00
- Piute-Eldorado Restoration, $3,663,000.00

These projects will be implemented as conservation actions under the 2021-2023 Implementation Plan and Budget. The final Secretary of Interior approval for Round 18 is expected to occur in summer/fall of 2021.

The BLM has also announced their intent to open up the Round 19 call for nominations in September 2021. In anticipation of this, Desert Conservation Program staff have begun identifying potential project concepts that would be suitable to nominate for SNPLMA funding under Round 19. These projects would also be implemented as conservation actions under the 2021-2023 Implementation Plan and Budget; however, since the projects are still under discussion, project concepts for Round 19 nominations are not included in this report. Round 19 nominations will be submitted to Board of County Commissioners for approval prior to submittal to the BLM. Projects that have been preliminarily identified as suitable for nomination under Round 19 include the following:

- Bitter Springs Restoration
- Desert Tortoise Long-term Monitoring Plots
- Muddy River Restoration, Phase II

LICENSE PLATE FUNDS

New for the 2021-2023 biennium, the Desert Conservation Plan has begun receiving additional revenue through the sale of specialty license plates in Nevada. Sales of the desert tortoise license plate began in 2018 and have earned approximately $70,000.00 in revenue; this is additional revenue that is available to use towards the implementation of the MSHCP for the 2021-2023 biennium.

DE-OBLIGATION OF PREVIOUSLY ALLOCATED FUNDS

In addition to the revenue sources described above, the Plan Administrator recommends de-obligating funds that were identified in previous biennia to offset costs of the 2021-2023 Implementation Plan and Budget. Project concepts that will be de-funded are no longer needed because of a change in circumstances since the concept was initially proposed. The following describes the three projects have been identified as no longer being warranted and the rationale for de-obligating funds.

- Temporary Holding Facility for Displaced Desert Tortoises (2015-2017 Implementation Plan and Budget): this project was initially proposed in order to provide for the construction of a new fence and access road to the location of our desert tortoise temporary holding pens. The fence and access road were needed because the BLM was proposing to remove the fence around the former Desert Tortoise Conservation Center (the location of our temporary holding pens). Since BLM has terminated the removal of their fence, these funds are no longer needed.
- Assessment of Desert Tortoise Guard Design (2017-2019 Implementation Plan and Budget): desert tortoise guards have been in use for more than a decade and are generally regarded by U.S. Fish and Wildlife Service as effective in reducing road mortalities of desert tortoise; therefore, this study is no longer needed.
- Off-highway Vehicle (OHV) Registration Program Marketing (2017-2019 Implementation Plan and Budget): the Desert Conservation Program provided $500,000.00 in funding to establish the Nevada Commission on OHVs and to establish a statewide registration program for OHVs. To ensure the registration program was successful, the Desert Conservation Program provided additional funding and contract management support to initiate a marketing campaign to inform OHV users of the program. The Commission has since hired administrative support staff and they have taken over the marketing efforts; therefore remaining funds for this project concept are no longer needed.

Section 10 funds to be de-obligated amount to $514,328.14. The Plan Administrator recommends these funds be rolled over into the 2021-2023 Implementation Plan and Budget to help defray costs of implementation.

COVID-19 BUDGET REDUCTION

Lastly, during the preparation of this Implementation Plan and Budget, the COVID-19 pandemic has had a serious impact on County revenue sources. As a result, all departments across the County were asked to make budget cuts. These requested budget cuts were met, in part, through the de-obligation of funds for one project that the

Desert Conservation Program has not been able to implement. The MSHCP Fee Consolidation project (proposed in the 2013-2015 Implementation Plan and Budget) was proposed to provide for a centralized, automated reporting and collection system for all mitigation fee payments. However, challenges related to the County's ability to accept credit card payments, in addition to code and ordinance changes that may be required by some jurisdictions, have prevented us from moving forward with this project. If these challenges are removed in the future, this project concept may be proposed again in an upcoming Implementation Plan and Budget.

PROJECT CONCEPT DEVELOPMENT

Although the process of developing the Implementation Plan and Budget has varied over the past biennia, the general steps of the budget development process are to determine available funding and to identify and recommend actions that further the purpose of the MSHCP. Certain actions that are stipulated by the Section 10 incidental take permit are considered required expenditures to maintain compliance, and therefore are non-discretionary. Non-discretionary actions include administering and managing MSCHP implementation, supporting the Adaptive Management Program, managing the Boulder City Conservation Easement (BCCE), managing acquired properties and water rights, maintaining the tortoise fencing program along major roads, operation of the Wild Desert Tortoise Assistance Line, and the public information and education program. Additional actions that are considered non-discretionary include actions specified by a Master Permit for the Removal or Destruction of Fully-protected Flora issued to the MSHCP Permittees by the Nevada Division of Forestry.

Other actions that further the goals and objectives of the MSHCP but are not directly specified in the incidental take permit or the master permit issued by Nevada Division of Forestry, are considered discretionary. These may include actions such as scientific research projects and desert tortoise augmentation projects. Both non-discretionary and discretionary actions are funded through the biennial Implementation Plan and Budget process and are approved by the Board of County Commissioners.

The process for developing the 2021-2023 Implementation Plan and Budget was an iterative process that began in April 2020. The Plan Administrator prepared draft budget principles and a draft process and schedule, which were provided to the U.S. Fish and Wildlife Service, Nevada Division of Forestry, and the independent Science Advisor Panel for review and comment on April 1, 2020. Attachment A outlines the process and schedule agreed to by the parties and used to prepare the 2021-2023 Implementation Plan and Budget. The budget principles, available in Attachment B, guide the development and selection of project concepts for the 2021-2023 biennium.

Based on the budget principles, the Science Advisor Panel prepared an independent review of the program and provided recommendations for discretionary funding projects. Additionally, the U.S. Fish and Wildlife Service, Nevada Division of Forestry, and Nevada Department of Wildlife were invited to submit funding recommendations to the Plan Administrator for consideration in the 2021-2023 Implementation Plan and Budget process. The Plan Administrator then prepared project concepts and budgets taking into account the various funding recommendations, guidance in the incidental take permit and MSHCP, the budget clarification agreed to between the Plan Administrator and U.S. Fish and Wildlife Service, current status of these efforts, needs anticipated during the 2021-2023 biennium, the budget principles developed by the Plan Administrator, and previous budgets and expenditures.

The Plan Administrator prepared the following non-discretionary project concepts for the 2021-2023 Implementation Plan and Budget:

1. Administration of the MSHCP: includes the imposition and oversight of a $550-per-acre development fee, implementation of an endowment fund, and implementation of conservation actions.
2. Management of the BCCE: provide for peace officer patrols of the BCCE and funding to conduct activities as outlined in the easement agreement and BCCE management plan.
3. Management of the Riparian Reserve Units and Water Rights: maintenance and management of Riparian Reserve Units along the Muddy and Virgin rivers.
4. Adaptive Management Program: provides for the continued implementation of an Adaptive Management Program, a required element of the MSHCP. This program examines different ways to meet MSHCP objectives using a science-based approach and helps answer questions relevant to land managers. Includes funding for the independent Science Advisor Panel and species and ecosystem monitoring within the reserve system.
5. Range-wide Desert Tortoise Monitoring Support: in coordination with the Desert Tortoise Recovery Office, continue monitoring of desert tortoise populations within Nevada using line distance sampling protocols.
6. Translocation Support: conduct translocation of wild desert tortoises displaced by development; identify additional sites suitable for translocation; conduct pre- and post-translocation monitoring of tortoises.

The Plan Administrator prepared the following discretionary project concepts for inclusion in the 2021-2023 Implementation Plan and Budget:

7. State Route 159 (SR159) Fencing: construct approximately 13 miles of desert tortoise exclusionary fencing along SR159.
8. Willow Creek Fencing: construct post-and-cable fencing to reduce unauthorized access and damage to the spring resource and riparian habitat.
9. BCCE North Border Fence: construct post-and-cable fence at strategic locations along the northern border of the BCCE to deter unauthorized off-road use.
10. Road Warriors: initiate a pilot project to evaluate the use of citizen scientist volunteers to conduct systematic surveys of roadways to document desert tortoise live encounters and mortalities.
11. Rainbow Gardens Conservation: construct post-and-cable fencing to deter unauthorized off-road use and conduct restoration within Las Vegas bearpoppy habitat.
12. Piute-Eldorado Restoration: conduct restoration of linear disturbances within the Piute-Eldorado Area of Critical Environmental Concern (ACEC) to improve desert tortoise habitat.
13. Reptile Monitoring Support: provide funding to Nevada Department of Wildlife to expand the current reptile monitoring program in Clark County; monitoring support will allow us to better determine population trends and to aid in the prioritization of conservation actions.
14. Predator-Prey Dynamics, Phase III: continues research on the relationship between black-tailed jackrabbit, coyote, and desert tortoise populations in the context of making better informed decisions regarding translocation of desert tortoises.

15. Riparian Restoration: restore, create, and enhance riparian habitat for MSHCP covered species within the
16. Muddy River and Virgin River reserve units.
17. Population Viability Analysis (PVA) – Data Gaps for Riparian Birds: examine available data to conduct population viability analyses for four riparian bird species and identify key data gaps.
18. Riparian Thermal Refugia Study: identify areas of potential thermal refugia in the Riparian Reserves using remote sensing data and by collecting daily and seasonal temperature data.
19. Riparian Plant Pollinator Ecology, Phase II: evaluate the success and sustainability of current management practices as they pertain to riparian plant and pollinator communities, and to determine if opportunities for improvement exist.
20. Investigate Screwbean Mesquite Die-off: identify the cause(s) of screwbean mesquite die-offs, determine the extent of the die-offs, and develop a forecast model to predict where they may occur next.
21. Rare Plant Propagation, Phase II: continue research that will allow us to utilize plant materials being developed during the first phase to investigate outplanting techniques which can then be used to respond to landscape-scale disturbances such as invasive species infestations and altered fire regimes.
22. Blue Diamond Cholla Surveys: conduct targeted field surveys in modeled Blue Diamond cholla habitat and gain information concerning the habitat preferences and range for this rare species.
23. Surveys for Gypsum Endemics: conduct surveys in gypsum habitats to increase our understanding of the distribution and abundance of the state listed Las Vegas bearpoppy and the Mojave poppy bee in Clark County.
24. Niles Herbarium Data: provide support to the Nevada Natural Heritage Program (NNHP) to incorporate data from the recently digitized Niles Herbarium dataset into the state's species database.
25. Vegetation Map Update, Phase II: provides for the continued development of the County-wide fine-scale vegetation map.
26. Permit Amendment Support: provide funding for supporting analyses necessary for the permit amendment application as well as consultants that will aid the County in preparing application documents and any associated agreements, management plans, or supplemental analyses.
27. U.S. 95 Telemetry Study: examine how translocated tortoises and resident tortoises differ in their use of roadway culverts to determine whether translocating tortoises near culverts is a viable strategy for increasing long-term demographic connectivity.

The complete project concepts are available in Attachment C.

PROJECT CONCEPT TIMEFRAMES

Section 2.1.12 of the MSHCP outlines the biennial budget development process. Additionally, per Clark County Fiscal Directives, funding for the Desert Conservation Program must be approved by the Clark County Board of County Commissioners, which has final decision-making authority over budgets and implementation of the MSHCP. Thus, it is the goal of the Desert Conservation Program to develop project concepts that can be completed within the two-year planning timeframe of the biennial budget development process. Note that project concept summaries are written with the two-year biennium timeframe in mind, but that work on many of these projects was begun in previous biennia and/or may continue past the current biennium. Because funding for each biennium must be approved by the Board of County Commissioners, funding for ongoing projects cannot be

guaranteed past the current biennium. However, unexpended funds from the current biennium may be rolled over for expenditure in future planning years (with the exception of funds budgeted for MSHCP Administration, which are fixed to each biennium and cannot roll over). Funds obtained from SNPLMA grants must be spent within 5 years of fund award; thus SNPLMA-funded project concept summaries may be written with longer project timeframes in mind.

SUMMARY OF DISCUSSIONS

STAKEHOLDER DISCUSSIONS TO DATE

A draft of the Process and Schedule and Budget Principles was provided to the independent Science Advisor Panel, the U.S. Fish and Wildlife Service, the Nevada Division of Forestry, and Nevada Department of Wildlife on April 1, 2020. No substantive comments were received. The final Process and Schedule and Budget Principles are provided in Attachments A and B, respectively.

The Science Advisor Panel provided an independent analysis of the program with funding recommendations on May 29, 2020. Senior-level staff within the Desert Conservation Program reviewed the Science Advisor Panel's funding recommendations to determine which projects should be advanced in the 2021-2023 Implementation Plan and Budget. Funding recommendations were also provided by U.S. Fish and Wildlife Service on June 4, Nevada Division of Forestry, and Nevada Department of Wildlife. A summary of all funding recommendations and response to recommendations is included in Attachment E.

A copy of the draft 2021-2023 Implementation Plan and Budget report, including project concepts and proposed budgets, was provided to U.S. Fish and Wildlife Service, Nevada Division of Forestry, Nevada Department of Wildlife, BLM, and the Science Advisor Panel on September 3, 2020. All comments were received by October 6, 2020; only the Science Advisor Panel and Nevada Division of Forestry chose to submit comments on the draft. A summary of comments and response to comments is provided in Attachment F.

PUBLIC COMMENT PERIOD AND RESPONSE TO COMMENTS

The Draft 2021-2023 Implementation Plan and Budget report was posted on Clark County's website (https://www.clarkcountynv.gov/government/departments/environment_and_sustainability/desert_conservation_program/index.php) on November 10, 2020. The public comment period closed at 5:00 p.m. PST on November 30th, 2020. No public comments were received during the comment period.

PROPOSED 2021-2023 IMPLEMENTATION PLAN AND BUDGET

Upon consideration of all the discussions and comments to date, the Plan Administrator has proposed a 2021-2023 biennial budget of $19,617,877.05. Proposed expenditures are detailed in Table 2 below. If unforeseen opportunities arise for additional conservation projects, the Plan Administrator may pursue funding approval for those projects with the Clark County Board of County Commissioners in coordination with the U.S. Fish and Wildlife Service. This Implementation Plan and Budget Report will be submitted to the Clark County Board of County Commissioners for approval following all stakeholder discussions and the public review period (estimated December 2020).

Table 2.

Proposed 2021-2023 Implementation Plan and Budget

Concept Number	Project Title	Funding Source		
		Section 10 Funds	Round 18 SNPLMA Funds	License Plate Funds
Administration*				
1	General Administration	$ 1,641,239.00	$	$
1	Staff Salaries and Benefits to Implement Conservation Projects**	$ 2,955,417.00	$	$
	Subtotal (Administration)	$ 4,596,656.00	$	$
Non-discretionary Conservation Projects				
2	Management of the BCCE	$ 327,000.00	$	$
3	Management of Riparian Reserve Units and Water Rights	$ 453,920.00	$	$
4	Adaptive Management Program	$ 1,150,024.15	$	$
5	Range-wide Desert Tortoise Monitoring Support	$ 388,135.53	$	$
6	Translocation Support	$ 277,646.94	$	$
	Subtotal (Non-discretionary Conservation Projects)	$ 2,596,726.62	$ 0.00	$ 0.00
Discretionary Conservation Projects				
7	SR159 Fencing	$	$ 1,149,500.00	$
8	Willow Creek Fencing	$ 100,000.00	$	$
9	BCCE North Border Fence	$ 250,000.00	$	
10	Road Warriors	$	$	$ 70,000.00
11	Rainbow Gardens Conservation	$	$ 3,878,000.00	$
12	Piute-Eldorado Restoration	$	$ 3,663,000.00	$
13	Reptile Monitoring Support	$ 72,000.00	$	$
14	Predator-Prey Dynamics, Phase III	$ 769,841.33	$	$
15	Riparian Restoration	$ 354,500.00	$	$
16	PVA - Data Gaps for Riparian Birds	$ 50,000.00	$	$
17	Riparian Thermal Refugia Study	$ 30,000.00	$	$
18	Riparian Plant Pollinator Ecology, Phase II	$ 72,105.00	$	$
19	Investigate Screwbean Mesquite Die-off	$ 125,000.00	$	$

Concept Number	Project Title	Funding Source		
		Section 10 Funds	Round 18 SNPLMA Funds	License Plate Funds
20	Rare Plant Propagation, Phase II	$ 628,573.00	$	$
21	Blue Diamond Cholla Surveys	$ 360,000.00	$	$
22	Surveys for Gypsum Endemics	$ 100,000.00	$	$
23	Niles Herbarium Data	$ 60,000.00	$	$
24	Vegetation Map Update, Phase II	$ 606,303.84	$	$
25	Permit Amendment Support	$ 300,000.00	$	$
26	U.S. 95 Telemetry Study	$ 300,000.00	$	$
	Subtotal (Discretionary Conservation Projects)	$ 4,178,323.17	$ 8,690,500.00	$ 70,000.00

Budget Summary	
Section 10 Funds	$ 11,371,705.79
Section 10 Rollover Funds	($ 514,328.14)
SNPLMA Funds	$ 8,690,500.00
License Plate Funds	$ 70,000.00
Total	**$19,617,877.05**

* Administrative costs, including staff salaries and benefits, are not included in individual project concept budgets because administrative expenses are fixed to each biennium and do not roll over. Administrative costs that were budgeted for in previous biennia will become unavailable at the close of each biennium.

** Provides staff funding to directly implement the discretionary and non-discretionary projects proposed for the 2021-2023 biennium as well as 50 existing conservation projects from previous biennia.

ATTACHMENT A

Process and Schedule

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This process and schedule is based on clarification language in the Implementation Agreement dealing with what to do in the event the Permittees' excess expenditures exceed the total required expenditure for the stated term of the incidental take permit, as proposed by Clark County and formally agreed to by U.S. Fish and Wildlife Service in writing.

- April 2020: Clark County, in consultation with the Permittees, Science Advisor, Nevada Division of Forestry, and U.S. Fish and Wildlife Service, develops the Implementation Plan and Budget Process and Schedule and Budget Principles to guide development of budget and conservation measures.
    - Early April 2020: Desert Conservation Program Senior Team develops the proposed Process and Schedule and the proposed Budget Principles.
    - Mid-April 2020: Draft Implementation Plan and Budget Process and Schedule and draft Budget Principles are provided to the Science Advisor, NDF, and U.S. Fish and Wildlife Service for review and comment.
    - Late April 2020: Desert Conservation Program requests that Science Advisor, NDF, and U.S. Fish and Wildlife Service submit any comments on the draft Implementation Plan and Budget Process and Schedule and draft Budget Principles. Desert Conservation Program prepares and distributes final Implementation Plan and Budget Process and Schedule and final Budget Principles.
- May 2020: Clark County, on behalf of the Permittees, establishes final Implementation Plan and Budget Process and Schedule and final Budget Principles, solicits funding recommendations for discretionary conservation measures, and prepares initial budget and conservation measure concepts for non-discretionary projects, as warranted.
    - Early-May 2020: Desert Conservation Program submits the final Implementation Plan and Budget Process and Schedule and final Budget Principles to the U.S. Fish and Wildlife Service and solicits U.S. Fish and Wildlife Service' recommendations for discretionary projects.
    - Early-May 2020: Desert Conservation Program submits the final Implementation Plan and Budget Process and Schedule and final Budget Principles to NDF and solicits NDF's recommendations for discretionary projects.
    - May 7th, 2020: Desert Conservation Program Plan Administrator reviews the final Implementation Plan and Budget Process and Schedule and final Budget Principles with the Executive Committee.
    - Mid-May 2020: Desert Conservation Program Plan Administrator briefs Clark County management on upcoming Implementation Plan and Budget process and reviews the final Process and Schedule and final Budget Principles.
    - Mid-May 2020: Desert Conservation Program staff prepares draft project concepts and budgets for non-discretionary conservation measures; submits to Desert Conservation Program Senior Team for review and editing.
    - May 30th, 2020: Science Advisor submits their Implementation Plan and Budget Funding Recommendations report.
- June/July 2020 – Desert Conservation Program reviews recommendations, finalizes budget and conservation measure concepts, and provides to Permittees, Science Advisor, NDF, and U.S. Fish and Wildlife Service for review and comment.
    - Early June 2020: Desert Conservation Program Senior Team discusses discretionary project recommendations provided by the Science Advisor, NDF, and U.S. Fish and Wildlife Service; develops initial list of projects for inclusion in the draft Implementation Plan and Budget report.

  - Early July 2020: Desert Conservation Program staff prepares draft project concepts and budgets for discretionary conservation measures; submits to Desert Conservation Program Senior Team for review and editing.
  - July 9th, 2020: Plan Administrator reviews draft project concepts and budgets with the Executive Committee.
  - Late-December 2020: Desert Conservation Program Senior Team staff compiles the draft Implementation Plan and Budget report; draft Implementation Plan and Budget report is provided to the Executive Committee, Science Advisor, NDF, and U.S. Fish and Wildlife Service for review and comment.
- September/October 2020: Desert Conservation Program revises the draft Implementation Plan and Budget report in consultation with the Permittees, Science Advisor, NDF, and U.S. Fish and Wildlife Service, as appropriate, and posts draft Implementation Plan and Budget report for public comment.
  - Late December 2020: Permittee, Science Advisor, NDF, and U.S. Fish and Wildlife Service comments on the draft Implementation Plan and Budget report are due.
  - Mid-October 2020: Desert Conservation Program staff address comments; prepare revised draft Implementation Plan and Budget report; post revised draft Implementation Plan and Budget report to Desert Conservation Program website for public review and comment.
- October/December 2020: Desert Conservation Program responds to public comment, finalizes Implementation Plan and Budget, and schedules item for Board of County Commission approval.
  - Mid-October 2020: Public comment period closes; Desert Conservation Program staff review public comments and prepare the final Implementation Plan and Budget report.
  - Early December 2020: Desert Conservation Program staff prepares draft Agenda Item; Deputy District Attorney reviews draft Agenda Item.
  - Late November/Early December 2020: Board of County Commissioners adopts final Implementation Plan and Budget report.
- December 2020 through June 2021: Desert Conservation Program works with the Science Advisor and other experts to determine detailed methods for implementing conservation measures and for any effects or effectiveness data collection and analysis, if needed.
- March through May 2021: If applicable, Desert Conservation Program staff prepares and submits proposals for funding under Round 19 of SNPLMA. This timeframe is tentative, as Round 18 submittal dates have not yet been established by the BLM and it is not yet known when Round 18 or 19 will open. Round 18 project nominations were described in the 2019-2021 Implementation Plan and Budget. Funding awarded under SNPLMA is typically made available approximately 12-14 months following the call for funding nominations.
- July 1, 2021: 2021-2023 Implementation Plan and Budget goes into effect.

Underlined dates have been scheduled; dates may be adjusted based on changing circumstances, as appropriate.

ATTACHMENT B

Budget Principles

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The following budget principles are to be used to guide and prioritize the development of project concepts, specifically those that are considered discretionary, not required, actions. Project concepts are expected to be responsive to these principles.

1. Fulfills explicit permit conditions outlined in the Section 10 incidental take permit.

2. Responds to recommendations from the Nevada Division of Forestry for actions to mitigate impacts to fully protected flora species.

3. Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted.

   From Spring 2017 through Spring 2019, approximately 6,593 acres of habitat were disturbed on private land. The majority of habitat disturbance was comprised of Mojave desert scrub (5,106 acres), and the remaining disturbance was comprised of 1,199 acres of salt desert scrub, 245 acres of mesquite/acacia, 21 acres of playa, 19 acres of desert riparian, and 3 acres of blackbrush habitat.

4. Provides for continued funding of ongoing and effective conservation measures.

5. Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program.

6. Responds to the most recent Science Advisor Panel recommendations.

7. Focuses on projects with measurable outcomes that are pertinent to the MSHCP.

8. Advances the amendment of the MSHCP and its conservation strategy.

9. Addresses program goals. Program goals that have been identified for the 2021-2023 biennium include:
   - Augmentation of desert tortoise populations
   - Restoration of desert tortoise habitat
   - Restoration of desert riparian habitat
   - Mitigation of impacts to mesquite/acacia, salt desert scrub, playa, and desert riparian habitat
   - Continue to expand species and habitat monitoring under the Adaptive Management Program

10. Addresses future changed and unforeseen circumstances. At the time of this writing, no changed and unforeseen circumstances have been identified.

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ATTACHMENT C

Project Concepts

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ADMINISTRATION

BACKGROUND AND NEED FOR PROJECT:

Administration of the Desert Conservation Program encompasses all aspects of implementing the MSHCP and complying with the incidental take permit issued by the U.S. Fish and Wildlife Service. Administering the MSHCP is categorized into the following functional units: permit and plan compliance, finance/administration, adaptive management, and project/contract management.

The benefit of properly implementing the MSHCP and complying with the incidental take permit is regional and streamlined environmental permitting that results in a reliable, certain, and predicable process for land development and other economic development activities in Clark County. The effective administration of the program also spares individual private-property owners from the complicated and time consuming task of consulting with the U.S. Fish and Wildlife Service on a project-by-project basis. Administration of the MSHCP has allowed the orderly economic development of over 101,750 acres and has saved the community an estimated $340 million in environmental compliance costs.

Administrative costs can generally be categorized as follows: 1) County internal service charges, 2) Desert Conservation Program operational expenses, 3) Salaries and benefits - general administration and 4) Salaries and benefits - implement conservation projects.

COUNTY INTERNAL SERVICE CHARGES TO THE DESERT CONSERVATION PROGRAM

The Desert Conservation Program is a Division within the Department of Air Quality. As such, since 2008, the Desert Conservation Program has received internal service charges from Clark County related to the following items: vehicles, insurance, telephones, cell phones, printing and reproduction, postage, department overhead, county overhead, enterprise resource planning, and information technology support services. For the 2021-2023 biennium, these expenses are estimated to be $567,100.00.

DESERT CONSERVATION PROGRAM OPERATIONAL EXPENSES

In addition, the Desert Conservation Program requires a budget for day-to-day operational expenses for items such as repairs and maintenance of facilities, repairs and maintenance of equipment, training and travel, paper shredding, office supplies, software, computers and supplies, and refunds. For the 2021-2023 biennium these necessary expenses amount to $89,000.00.

SALARIES AND BENEFITS

The Administration project concept also provides for sufficient staff possessing the correct skill sets and experience to ensure successful implementation of the Desert Conservation Program and achieve a sustained response to Recommendation Number 27 in the Clark County Desert Conservation Program Management Analysis published by Kirchoff and Associates in December 2005, and adopted by the Board of County Commissioners. This independent analysis determined that the Desert Conservation Program was inadequately

staffed for the scope, scale, and complexity of the MSHCP and recommended that the county acquire additional staff resources to adequately administer the program.

Following the Program Management Analysis, the county prepared a staffing analysis and plan in 2006 to ensure a reliable total headcount of employees with sufficient skill sets and flexibility to implement the MSHCP. The ideal staffing estimate avoids staffing needs exceeding staff availability or over staffing at any point and in any given role. Perceived staffing deficits and overages are first opportunities for resource-leveling and prioritization before taking action to supplement or decrease staffing levels.

The Desert Conservation Program is currently authorized for up to 16 full-time equivalents (FTEs), with 7 FTEs currently filled and 9 FTEs vacant. The Desert Conservation Program strives to achieve a 75 percent utilization rate of staff time to conservation projects and no more than 25 percent to overall administrative efforts such as required county training, departmental efforts such as the safety or time and attendance committees, staff meetings, or employee leave. The Desert Conservation Program is proposing to staff the 2021-2023 Implementation Plan and Budget with 11 FTEs; 4 recruitments are underway to fill current vacancies. This would leave 5 FTEs vacant and continue the program's vacancy savings of $511,942.00 for the 2021-2023 biennium.

Staff is organized into the following operational units:

- Permit and Plan Compliance. The program maintains a position dedicated to ensure compliance with state and federal permits associated with state and federally-listed species. This area of work focuses on compliance tracking and reporting as outlined in the MSHCP. This position also manages efforts toward amending the MSHCP.
- Finance/Administration. The finance and administrative work consists of overseeing the assessment, collection, and reporting of mitigation fees collected by the Permittees; overseeing the reporting of land disturbance and exempt acres; overseeing the budgeting, accounting, and accounts payable areas of operation; and coordinating SNPLMA assistance agreements and compliance therewith.
- Adaptive Management. The Adaptive Management Program team provides the following:
    - Oversight and project management of Science Advisor, peer reviews, and spatial and statistical analysis contracts;
    - Maintenance and administration of the database containing MSHCP-generated and related spatial and aspatial data;
    - Analysis of land use trends, habitat loss by ecosystem, species and habitat monitoring data, and implementation status;
    - Production of periodic status reports on the Adaptive Management Program;
    - Participation in regional GIS coordination teams and recovery implementation teams;
    - Ensuring availability of MSHCP technical reports to partners and public as appropriate; and
    - Acquisition of best available scientific and commercial data from Desert Conservation Program staff efforts, agencies, consultants and commercial sources to address the above analyses.
- Project/Contract Management. The project/contract management team is responsible for overseeing the procurement, contract and agreement management for the Program, and for providing project management and oversight for all projects, including but not limited to:

- BCCE management
- Wild desert tortoise assistance
- Fencing (for wildlife and habitat protection)
- Riparian property management
- Other property management (including water rights)
- Information, outreach and education

The project management team is also responsible for communication with related project stakeholders and for identifying, resolving or escalating important project-related issues, and managing the risks and contingencies related to all projects.

- District Attorney. The District Attorney - Civil Division's Office provides a dedicated attorney to provide legal counsel to the Desert Conservation Program in the areas of open meeting law, contract and procurement law, real estate law, and compliance with Section 10 of the Endangered Species Act. Since the Desert Conservation Program receives dedicated and priority support, the Desert Conservation Program funds 50 percent of the salary and benefits for the position and these figures are included in the Desert Conservation Program's salaries and benefits budget.

For the 2021-2023 biennium, the total required salaries and benefits budget is $3,940,556.00. It is important to note that only a portion, 25 percent or $985,139.00, of this budget is allocated for general administrative activities and that 75 percent of this budget, or $2,955,417.00, consists of the staff salaries and benefits dedicated to the direct implementation by staff of 76 existing and proposed conservation projects.

ADMINISTRATIVE BUDGET AMOUNTS IN CONTEXT

The total recommended Implementation Plan and Budget for 2021-2023 is $19,617,877.05. County internal service charges, Desert Conservation Program operating expenses, and salaries and benefits for general administration of the program amounts to $1,641,239.00, or 8.4 percent of the total proposed budget. It should be noted that 50 "master project" budgets totaling $28,062,876.69 are currently ongoing and will continue to be administered into the upcoming biennium, and that the administrative budget does not roll from biennium to biennium like other projects. When analyzed in this context, the general administration budget of $1,641,239.00 is 3.4 percent of the total funds being administered during the 2021-2023 Implementation Plan and Budget.

The remaining $17,976,638.05 or 91.6 percent of the 2021-2023 budget is comprised of the direct project costs of the proposed conservation projects ($15,021,221,.05) and the Desert Conservation Program staff salaries and benefits to implement the existing and proposed conservation projects ($2,955,417.00).

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project is not suitable for an adaptive management approach.

PROJECT GOAL(S):

The goal of the administration of the Desert Conservation Program is to implement the MSHCP in a manner that minimizes and mitigates the impacts of take to the maximum extent practicable and to ensure compliance with its associated incidental take permit (TE 034927-0).

PROJECT OBJECTIVE(S):

- Adequately staff the Desert Conservation Program with personnel possessing the skills and qualifications necessary to properly implement the program.
- Provide for County overhead expenses.
- Provide staff with adequate supplies, equipment, and support services to properly implement the program.

PROJECT APPROACH:

Administration of the Desert Conservation Program will be done in accordance with the MSHCP, incidental take permit, and Clark County policy, procedure, and practice. In the past, the Desert Conservation Program outsourced the majority of the work related to implementation of the MSHCP. Over the last four biennia, there has been a shift towards Desert Conservation Program staff taking a much more active role in performing the work necessary to comply with plan and permit requirements. The Desert Conservation Program will continue to use a combination of outsourcing and conducting work in-house to meet program requirements.

PROJECT COST

County Internal Service Charges	$567,100.00
Operational Expenses	$89,000.00
Salaries and Benefits for General Administration	$985,139.00
Salaries and Benefits for Implementation of Conservation Projects	$2,955,417.00
Total Administration Budget	$4,596,656.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the Section 10 incidental take permit. Permit Condition H and Section 2.1.8.2 of the MSHCP, require the Permittees to carry out the minimization, mitigation, and monitoring measures specified in Section 2.8 of the MSHCP.

MANAGEMENT OF THE BCCE

BACKGROUND AND NEED FOR PROJECT:

As partial mitigation for the take of desert tortoise and their habitat, the 1995 incidental take permit (Permit Number: PRT-801045) issued to the Permittees required that a conservation easement be established in the Eldorado Valley for the protection of the desert tortoise and its habitat. The BCCE was established by agreement between Clark County and the City of Boulder City in July of 1995 to fulfill this requirement of the incidental take permit. This project concept would provide for the continued management of the BCCE, including law enforcement patrols, ongoing site maintenance and upkeep, and weed inventories and treatments.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

As this project is mostly on-site property maintenance it does not lend itself to an adaptive management approach. Weed control may benefit from an adaptive management approach, however the Desert Conservation Program contracts to professionals who are tasked with determining what weed control measures are the most efficient and cost-effective.

PROJECT GOAL(S):

The work conducted in this project will address elements of the Clark County MSHCP. Work will be conducted in accordance with the BCCE Agreement, as amended and restated in 2019, and the most updated version of the BCCE Management Plan.

The project goals are to:

- Increase the effectiveness of conservation actions within the BCCE.
- Protect and preserve the desert habitat for the benefit of MSHCP covered species and other native plants and animals.
- Manage the property and public use to meet conservation obligations and legal requirements.
- Deter the incidents of illegal activities and prohibited uses that occur on the BCCE.

PROJECT OBJECTIVE(S):

BCCE MANAGEMENT

- Review and analyze management actions for consistency with the BCCE Agreement, as amended and restated in 2019.
- Review all applications for activities that affect the BCCE and provide approval recommendations to the Plan Administrator. Applications may include rights-of-way projects, events, research and monitoring, and other activities allowable by written permission of the County. Coordinate application reviews with Boulder City and the U.S. Fish and Wildlife Service and monitor permitted project activities and restoration as required by Attachment F of the BCCE Agreement.
- Review and update the BCCE Management Plan to reflect current conditions and program goals.
- Respond to Permittee questions regarding the BCCE and allowable activities.

- Coordinate with Boulder City, neighbors, and other easement holders as needed.
- Visit the BCCE weekly to monitor and maintain signage, fencing, desert tortoise guards, barriers, and kiosks in good condition.
- Develop and deliver information, using brochures, meetings, and videos that help instruct and inform users of the BCCE about authorized activities and how to conserve the habitat and protect the desert tortoise.

BCCE LAW ENFORCEMENT –

- Patrol the BCCE 24-32 hours a week over three to four days. Patrols are always on Saturday and Sunday and then any other days Monday thru Friday.
- Review law enforcement patrol reports weekly to determine trouble spots and to make adjustments to patrol schedules and routes as needed.
- Meet on-site at least monthly with Desert Conservation Program staff to review issues and determine solutions to fix identified issues. Issues may include unauthorized off-road travel, dumping, shooting, camping, or any other illegal activities that are detrimental to the habitat.
- Make contact with all visitors to the BCCE and give them brochures indicating permitted activities and maps of open roads. Educate users of the BCCE first and cite repeat offenders.
- Allocate additional time to monitor areas of high violations.

BCCE WEED CONTROL –

- Conduct annual Winter and Spring/Summer weed surveys and controls by surveying public and private roadsides for non-native vegetation within the BCCE.
- Control incipient occurrences of invasive, non-native vegetation, exclusive of widespread and well-established species.
- Provide annual written report on weed monitoring activities and recommendations.

BCCE SITE MAINTENANCE AND CLEANUP

- Cleanup along roadways, dump sites and target shooting sites every four months.
- Repair kiosks, energy zone fencing, fences and barriers, plus clean out cattle guards, desert tortoise culvert, and desert tortoise guards as needed.

PROJECT APPROACH:

Staff and contractors will be used to perform the above functions using the best available data. Appropriately certified peace officer personnel will conduct law enforcement activities with possible assistance from other parties. All work will be conducted in accordance with the BCCE Agreement, as amended and restated in 2019, and the most updated version of the BCCE Management Plan.

PROJECT COST

$327,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the current permit. This project fulfills permit condition P, which requires the management of the BCCE to protect and manage the desert tortoise and its habitat.

Principle #3 – Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. The BCCE consists of Mojave Desert Scrub habitat, in which 5,106 acres of this type of habitat was disturbed from 2017 to 2019.

Principle #4 - Provides for continued funding of ongoing and effective conservation measures. This project provides for ongoing management of the BCCE by funding law enforcement, weed management, signage and fencing maintenance and restoration activities.

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program This project addresses Biological Goals and Objectives D 1.4 inventory, remove, and control invasive and non-native plant species, D 3.2 promote responsible recreation, and D 3.3 provide law enforcement within the reserve system.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project is pertinent to the MSCHP because it is an explicit permit condition that result in measurable outcomes such as number of patrol hours, number of visitors encountered, number of warnings and citations. This information can be compared across months and years to get a picture of activities on the BCCE. Also, with the weed control project we can quantify current acres of weeds, types of weeds and over time the change in weed populations and the impact on the habitat.

MANAGEMENT OF RIPARIAN RESERVES AND WATER RIGHTS

BACKGROUND AND NEED FOR PROJECT:

Condition K of the incidental take permit stipulates that take of covered avian species is conditioned upon the acquisition of private lands in desert riparian habitats along the Muddy and Virgin rivers and the Meadow Valley Wash in Clark County, Nevada. To comply with this permit condition, the Desert Conservation Program has acquired properties with riparian habitat along the Virgin and Muddy rivers in Clark County, Nevada. These properties comprise the Muddy River Reserve Unit and the Virgin River Reserve Unit (collectively, the Riparian Reserve Units), part of the overall Clark County Reserve System portfolio, which serves to mitigate impacts to covered species, and conserve habitats and important wildlife connectivity corridors. To date, the Desert Conservation Program has acquired 9 parcels along the Muddy River comprising 166 acres and 16 parcels along the Virgin River comprising 546 acres.

This project will provide for the continuance of existing property monitoring and maintenance activities within the Riparian Reserve Units and management of water rights held by the Desert Conservation Program.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project covers maintenance and monitoring of the riparian properties. The science behind this is sound and the methods are fully accepted. This project would do well under a structured decision making[1] approach but a full adaptive management approach is not necessary at this time.

PROJECT GOAL(S):

The project goals are to:

- Mitigate impacts to MSHCP Covered Species by providing ongoing monitoring, maintenance, and management of the Riparian Reserves. This will ensure the properties' value for species covered by the MSHCP and facilitate successful habitat restoration.
- Maintain Desert Conservation Program's water rights in good standing and allow for acquisition or lease of additional water rights if necessary to support restoration.

PROJECT OBJECTIVE(S):

RIPARIAN RESERVE UNITS MANAGEMENT

- Review and analyze management actions for consistency with the *Riparian Reserve Units Management Plan*.
- Review and update the management plan to reflect current conditions.

[1] Structured decision making is a general term for carefully organized analysis of problems in order to reach decisions that are focused clearly on achieving fundamental objectives (U.S. Fish and Wildlife Service, 2008. Structured Decision Making Fact Sheet).

- Respond to Permittee questions regarding the Riparian Reserve Units, associated water rights, and allowable activities.
- Maintain property in good condition. Clean trash, dead vegetation, and other debris, as necessary.
- Conduct inventories for native and non-native plant species.
- Coordinate with adjacent landowners as needed and maintain positive interactions with neighbors.
- Review all applications for activities that may affect the Riparian Reserve Units.
- Install perimeter fencing as necessary.
- Inspect and repair property improvements (fences, groundwater pump and associated canal and pond, irrigation system, municipal water hookup, etc.) on a weekly basis and maintain access roads and trails in good condition.
- Maintain or create fire breaks as needed.
- Develop and deliver information through brochures, websites, meetings, and other methods as appropriate to help instruct and inform the public about the purpose and benefit of the Riparian Reserve Units.
- Investigate and appropriately respond to unauthorized uses of the Riparian Reserve Units; coordinate with law enforcement and regulatory agencies as needed.

WEED CONTROL

- Conduct surveys of non-native weed species.
- Control incipient occurrences of invasive, non-native vegetation.
- Provide annual written summary of activity and recommendations.

MANAGEMENT OF WATER RIGHTS

- Maintain existing water rights in good standing.
- Pursue acquisition of additional water rights for habitat restoration, as needed.
- Identify water rights appropriate for transfer to other entities and facilitate transfer.

PROJECT APPROACH:

Field crews provided by contractors will be used to conduct plant inventories and targeted weed control of invasive and noxious weeds. Weed control efforts will consist of targeted herbicide spraying. Contractors will be hired to conduct routine property maintenance and to advise the Desert Conservation Program on water rights matters. All work will be conducted in accordance with the most recent Riparian Reserve Units Management Plan. Management activities may be conducted on existing properties or properties that may be acquired through the conclusion of the biennium on June 30, 2021.

PROJECT COST

$453,920.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. From spring 2017 through spring 2019, 19 acres of desert riparian and 245 acres of mesquite/acacia habitat have been disturbed.

Principle #4 - Provides for continued funding of ongoing and effective conservation measures. This project provides for ongoing management of riparian and mesquite/acacia habitat.

Principle #5 - This project will address the following Biological Goals and Objectives: Objectives R1.2 to maintain suitable breeding habitat for MSHCP-covered birds; R1.4 inventory, remove, and control invasive and non-native plant species; and R3.1 to collaborate with other stakeholders.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project is pertinent to the MSCHP because Desert Conservation Program staff can create measurable outcomes such as number of site visits, type/extent of weeds removed, etc.

Principle #9 – Address program goals, specifically restoration of desert riparian habitat. Managing invasive plant species on the Reserve Units will allow more native species to populate the property and facilitate the natural restoration of desert riparian habitat.

ADAPTIVE MANAGEMENT PROGRAM

BACKGROUND AND NEED FOR PROJECT:

An Adaptive Management Program is a required element of the MSHCP. The Adaptive Management Program reviews past, current, and ongoing MSHCP activities; makes recommendations for potential projects that would meet MSHCP needs; identifies projects that do not meet MSHCP needs; provides designs for scientifically-sound monitoring protocols that are tailored to MSHCP questions; and helps to adjust currently funded projects to incorporate the best available science as it becomes available. To meet the requirements of this program, Clark County must seek out well qualified scientists and experts who can provide independent technical review of all MSHCP activities. This project will also provide for implementation of the Adaptive Management Monitoring Plan and collection of species and habitat monitoring data within the BCCE and Riparian Reserve Units that can be used to compare against future surveys. Funding would also provide for field testing and refinement of methodology. Results will be used to guide future management and restoration actions for the benefit of covered species.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

The Adaptive Management Program provides for the review and evaluation of all projects and is therefore a crucial component in adaptively managing all projects for the MSHCP. This project would also provide effectiveness monitoring[2] for both the BCCE and Riparian Reserve Units which will allow for a better understanding of how management actions affect covered species.

PROJECT GOAL(S):

The Adaptive Management Program provides for the use of best available scientific and technical data to make sound management recommendations for MSHCP implementation, as required by the Section 10 incidental take permit.

PROJECT OBJECTIVE(S):

The above goals will be achieved by implementing the following objectives:

- Contract an Independent Science Advisor Panel to provide in-depth advice on potential projects and deliverables, as well as assist with designing new projects and monitoring plans to help ensure an adaptive management approach to all appropriate projects. The Science Advisor Panel will also develop the biennial Adaptive Management Report, which details land use trends, habitat loss by ecosystem, and implementation status.
- Provide for the ability to hire additional contractors or amend current contract(s) to ensure that the best available science is being used for all projects.

[2] Effectiveness monitoring is monitoring that assesses the effectiveness of a conservation action. The monitoring is done to determine if project performance goals and objectives are being met.

- Perform desert and riparian ecosystems baseline inventory and monitoring within reserve units.
- Conduct monitoring surveys for the following groups of covered species within the reserve system and test and refine species monitoring protocols, as appropriate:
    - Birds
    - Bats
    - Desert tortoise
    - Reptiles

PROJECT APPROACH:

Staff and contractors will be used to perform the above functions using the best available scientific and commercial data. The Science Advisor Panel will continue to add their expertise to ensure that the best available science is being used in the development of new projects and to help determine appropriate places for adaptive management to be used within the program.

For the species surveys, methods will be determined through use of the Adaptive Management and Monitoring Plan and in collaboration with the Science Advisor Panel. All species surveys will be conducted using established protocols and best available scientific standards.

Methods to determine the desert and riparian ecosystems baseline inventory and monitoring will be determined in an upcoming workshop with the Science Advisor Panel.

PROJECT COST

$1,150,024.15

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1. Permit Condition I states that the Permittees will ensure that a science based Adaptive Management Program is developed and implemented as specified in the MSHCP. This project is the continuation of the science based approach that was laid out in earlier biennia.

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. The majority of habitat disturbance was comprised of Mojave desert scrub (5,106 acres), and the remaining disturbance was comprised of 1,199 acres of salt desert scrub, 245 acres of mesquite/acacia, 21 acres of playa, 19 acres of desert riparian, and 3 acres of blackbrush habitat.

Principle #4. This project will provide continued funding for a Science Advisor Panel under contract 2019-ALTA-1920A.

Principle #5. The Adaptive Management Program would address all Biological Goals and Objectives that have been developed. This project will have an effect on all projects that are implemented to achieve the Biological Goals and Objectives for the program.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project is pertinent to the MSCHP because it can create measurable outcomes such as number of birds surveyed, number of species present per site, percent of habitat in use, etc.

Principle #9. The Adaptive Management Program will play a role in supporting or completing many of the program goals including augmentation of desert tortoise populations, restoration of desert tortoise habitat, restoration of riparian habitat, mitigation of impacts to mesquite/acacia, salt desert scrub, playa, and desert riparian habitats, and expanding the species and habitat monitoring under this program.

RANGE-WIDE DESERT TORTOISE MONITORING SUPPORT

BACKGROUND AND NEED FOR PROJECT:

This project would continue long-term monitoring of desert tortoise populations in critical habitat. This monitoring provides information to address delisting criteria of the *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (U.S. Fish and Wildlife Service 2011). Estimates and population trends currently exist for a 13-year period, indicating population growth toward recovery in 5 of the 6 recovery units. However, delisting criteria require 25 years of increasing population trends in all 6 recovery units. Continued monitoring of these populations will be used to determine the effectiveness of other mitigation actions as well as allow for delisting once delisting criteria are met.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project is part of a larger effort to track tortoise populations across its range and to gather information that may eventually result in the delisting of the species. Data from range-wide monitoring can also be used to monitor effectiveness of large-scale management actions that may affect population trends over time. Therefore, this project would be considered a part of an adaptive management approach already being run by the U.S. Fish and Wildlife Service. As such, changes to that program would be directed by the U.S. Fish and Wildlife Service and would be subject to current requirements outlined in the Desert Tortoise Recovery Plan.

PROJECT GOAL(S):

The goal of this project is to continue to generate estimates of Mojave desert tortoise population density within the Tortoise Conservation Areas located in Nevada over the next two years.

PROJECT OBJECTIVE(S):

The objectives of this project are:

- Provide a population estimate for each of the six Tortoise Conservation Areas over a 2-year period. These data will be used along with data collected in California to determine desert tortoise population trends across the Mojave Desert.
- Obtain biennial estimates of tortoise density within the Tortoise Conservation Areas until delisting criteria are achieved.

PROJECT APPROACH:

Contractors will combine radiotelemetry of desert tortoise with line distance sampling protocols to locate new tortoises and develop density estimates for tortoises across the six Tortoise Conservation Areas in Nevada. All field staff will go through extensive training on proper handling and sampling techniques to ensure that the project is completed accurately and safely.

PROJECT COST

$388,135.53

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Budget Principle # 5. Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will support the Biological Objectives 2.1 to monitor and adaptively manage for desert tortoise populations, and D 3.1 collaborate with other stakeholders on project/mitigation work.

Budget Principle # 7. Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project has a measurable outcome (population density estimates) and is pertinent to the MSHCP.

TRANSLOCATION SUPPORT

BACKGROUND AND NEED FOR PROJECT:

While recent research on translocation has provided useful insight, results are currently only available for periods less than five years. Since it can take over 20 years for newly hatched tortoises of translocated animals to reach sexual maturity it will take at least that long to evaluate the usefulness of translocation as a recovery tool. Along with the time aspect of the problem there are also various risks that have not been fully evaluated, and long-term success has not been documented. We do not fully understand the long-term impacts of translocation, including for example, altered disease dynamics or changes to effective population size. By continuing studies of previous translocation sites we can begin to expand our knowledge of these issues.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project is ideal for an adaptive management approach. There are many uncertainties that still need to be addressed, especially considering the long lifespan of tortoises. There are plenty of opportunities to change strategies as a large portion of development in Clark County occurs within the range of the tortoise. This project may also be useful in evaluating the need for adaptive management in other projects on the BCCE.

PROJECT GOAL(S):

The goal of this project is to continue to assess the state of translocated populations of desert tortoises on the BCCE to help better inform future translocation efforts.

PROJECT OBJECTIVE(S):

The objectives of this project are to:

- Continue monitoring movement patterns, mortality rates, and health status of translocated versus resident tortoises on the BCCE over an extended period of time to allow for a better understanding of how effective translocation is over the long term.
- Determine health status of all telemetered individuals currently in the study to see if there have been any changes over time.

PROJECT APPROACH:

The Desert Conservation Program will continue to coordinate with the Desert Tortoise Recovery Office in conducting activities related to translocation of desert tortoises. This project will combine the use of radiotelemetry and health assessments to obtain pertinent information relevant to translocations. Both approaches have defined protocols and contractors will need to be certified in these protocols to carry out these projects. Certification is awarded through the U.S. Fish and Wildlife Service and guidelines and protocols can be found at the following website https://www.fws.gov/nevada/desert_tortoise/dtro/index.html. Projects will focus

on looking at population changes, mortality, disease prevalence, and movement patterns and how effective translocation is at augmenting populations over time.

PROJECT COST

$277,646.94

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle # 3. Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. This project would implement minimization/mitigation actions by helping us to further understand the effects of translocation on both translocated and resident populations.

Principle # 4. Provides for continued funding of ongoing and effective conservation measures. This project would continue the funding for years 4 and 5 of contract 2013-GBI-1412D. This project has been very useful, not only for its intended purpose of determining the successfulness of the translocation, but the data has also been used to publish a peer-reviewed journal article on survival rates within the Eldorado Valley.

Principle # 5. Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project would address Biological Goal and Objective D 2.1 to monitor and adaptively manage for desert tortoise populations and D 2.2 to augment populations through translocation programs when appropriate. This project will inform future translocation as well as identify new locations where translocation may be suitable.

Principle # 9. Addresses program goals. This project addresses the program goal for augmentation of desert tortoise populations. It will allow for a better understanding on how translocated tortoises interact with their environment as well as locate new areas for translocation.

SR159 FENCING

BACKGROUND AND NEED FOR PROJECT:

Desert tortoise mortality along roads and highways has been identified as a significant issue relative to recovery of the species. Further, restricted movement of desert tortoises across roadways may limit or entirely prohibit access to suitable habitat, resources, and mates. Past research has demonstrated that the abundance of tortoise sign is reduced within close proximity to unfenced roadways, resulting in a road-effect zone along highways, particularly those with high traffic volumes.

SR159 is a 13.5-mile east-to-west highway in southern Nevada that passes through the Red Rock Canyon National Conservation Area, a popular destination that receives more than 2.5 million tourists per year on average. SR159 also provides a major thoroughfare within the Las Vegas metropolitan area and a portion of the west end of this route is designated as a Nevada Scenic Byway. The Red Rock Canyon National Conservation Area provides high-quality habitat for the desert tortoise and supports a significant population of the species. Tortoise mortalities and illegal capture of tortoises approaching the road by citizens have been observed along SR159, and reports are received on a weekly basis by the BLM during the active season for tortoises.

To reduce tortoise mortality along SR159, the Desert Conservation Program will provide financial and project management assistance for the construction and/or installation of tortoise exclusionary fencing along SR159 for approximately 13.5 miles (27 total fencing miles for the east and west sides of SR159).

This project would fund and implement the construction of fencing from milepost 0.0 to milepost 13.5. Under this project, the fencing would reduce unauthorized use and access to sensitive habitats and restoration areas, protect desert tortoises from crossing SR159, and reduce the likelihood that wild tortoises would be illegally captured by citizens.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

While new fencing material exists that may, one day, replace the current standard materials that are used for desert tortoise exclusionary fencing, the new material has not yet proven to be more durable than the current standard materials. Until such time that more research can be done, or a smaller area can be completed using an adaptive management approach, fencing projects should continue as a structured decision-making process using the materials that are known to work effectively and have a relatively long life span.

PROJECT GOAL(S):

The goal of this project is to reduce roadway mortalities of desert tortoise and other wildlife on SR159.

PROJECT OBJECTIVE(S):

This project will provide funding for desert tortoise exclusionary fencing to reduce unauthorized use and access to sensitive habitats and restoration areas and protect desert tortoise from crossing SR159. Objectives for this project are as follows:

- Analysis of potential project impacts in accordance with the National Environmental Policy Act, including any supporting studies (e.g., cultural and biological resource surveys).
- Pre-construction desert tortoise clearance and monitoring activities.
- Construction of fencing, culverts, access gates, and tortoise guards.
- Restoration of any temporary disturbance areas.

INSTALL DESERT TORTOISE EXCLUSIONARY FENCING ALONG SR159

To provide for adequate protection of the desert tortoise and unauthorized use and access to sensitive habitats and restorations areas, the Desert Conservation Program would provide funding to install desert tortoise exclusionary fencing along 13.5 miles of SR159 (for a total of 27 miles of fencing along both sides of the road). Fencing will be located between milepost 0.0 and milepost 13.5 along the east and west side of SR159. The tortoise fencing would be installed within NDOT right-of-way in the Red Rock National Conservation Area. The Desert Conservation Program would hire a fencing contractor to install the fence. All fencing installation will be documented by the contactor, global positioning system (GPS) data loggers, or photographs.

TORTOISE GUARDS, CULVERTS, AND SHADE STRUCTURES TO BE INSTALLED

It is anticipated that up to 12 tortoise guards would be evaluated and installed where needed and up to 5 culverts will be installed. Up to 50 shade structures would be evaluated and installed where needed. The Desert Conservation Program will work with BLM, Nevada Department of Transportation, U.S. Fish and Wildlife Service and contractors to evaluate possible installations for maintaining tortoise connectivity (there are approximately 35 steel/concrete culverts within the project area). All fencing installation will be documented by the contractor, GPS data loggers or photographs.

PROJECT APPROACH:

Desert Conservation Program will help coordinate with BLM, U.S. Fish and Wildlife Service, and NDOT to ensure that all required National Environmental Policy Act (NEPA) analyses, surveys, highway occupancy permits, and requirements are completed prior to installation of the fence and tortoise guards. The Desert Conservation Program will work with contractors to evaluate possible installations for maintaining tortoise connectivity and shade structures. Authorized desert tortoise biologist(s) may consist of Desert Conservation Program staff and/or contractors with appropriate experience and qualifications. Post-construction monitoring will be included in this project to collect data on desert tortoise use of culverts and other desert tortoise metrics.

PROJECT COST

$1,149,500.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the current permit. Permit Condition N requires the Permittees to retrofit, repair, and construct desert tortoise fencing along highways and roads within Clark County. This project concept fulfills Permit Condition N.

Principle #3 - Provides for continued funding of ongoing and effective conservation measures. Desert tortoise exclusionary fencing and other wildlife fencing is an established, effective measure to reduce mortality of sensitive species and provide for the protection of sensitive habitats. This project would provide funding to increase the amount of wildlife fencing within Clark County.

Principle #4 – Provides for continued funding of ongoing and effective conservation measures. This project provides for continued funding of desert tortoise exclusionary fencing installation, a well-established effective conservation measure.

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will address the objective D 1.2 by helping to maintain intact functional habitat along SR159 by blocking entry to illegal off-road activities.

WILLOW CREEK FENCING

BACKGROUND AND NEED FOR PROJECT:

Willow Creek is a high flow spring that supports a large riparian area. The spring is home to the Spring Mountains springsnail (MSHCP covered species) and the riparian area supports a large assemblage of species of birds covered under the MSHCP. MSCHP covered species that have been documented in the vicinity include Bell's vireo, blue grosbeak, phainopepla, summer tanager, Spring Mountains acastus checkerspot, Spring Mountains springsnail, Nevada admiral, clokey milkvetch, and limestone violet . The creek was previously damaged by unregulated OHV travel and feral horse use until a post-and-cable fence was constructed in 2008. The post-and-cable fence has recently fallen into disrepair and has become a wildlife hazard to large animals accessing the water at the creek. Replacing the existing post-and-cable fence with a steel pipe rail fence will protect the riparian area while still allowing large animals such as elk and mule deer safe access to the creek. This project would provide funding to construct approximately 6,300 feet of steel pipe rail fence at the Willow Creek spring.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

While new fencing material exists that may one day replace the current standard materials that are used for steel pipe rail fencing, the new material has not yet proven to be more durable than the current standard materials. Until such time that more research can be done, or a smaller area can be completed using an adaptive management approach, fencing projects should continue as a structured decision-making process using the materials that are known to work effectively and have a relatively long life span.

PROJECT GOAL(S):

The goal of this project is to protect and preserve the riparian habitat at Willow Creek spring for the benefit of MSHCP covered species.

PROJECT OBJECTIVE(S):

- Complete a Documentation of NEPA Adequacy analysis.
- Remove and dispose of existing post-and-cable fencing.
- Construct approximately 6,300 feet of steel pipe rail fencing to deter OHV use and prevent feral horses from damaging the riparian habitat.

PROJECT APPROACH:

NEPA analysis was completed in 2008 when the post-and-cable fence was constructed. Since this project is substantially similar to the 2008 project, a Documentation of NEPA Adequacy analysis should be sufficient for meeting NEPA requirements. Desert Conservation Program staff will work with Nevada Department of Wildlife and the U.S. Forest Service to complete the analysis. A construction contractor will be selected using standard County contracting procedures. The construction contractor will remove the existing fence and dispose of the material before constructing the new steel rail pipe fence. Once complete, Nevada Department of Wildlife will assume ownership of the fence.

PROJECT COST

$100,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #4 - Provides for continued funding of ongoing and effective conservation measures. This project will replace a damaged fence that was previously working well to deter unauthorized OHV use and feral horse damage.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project is pertinent to the MSCHP because Desert Conservation Program staff can create measurable outcomes such as linear feet of fencing installed.

BCCE NORTH BORDER FENCE

BACKGROUND AND NEED FOR PROJECT:

Clark County purchased the BCCE in July 1995 from the City of Boulder City as partial mitigation for activities conducted under the County's Section 10 incidental take permit. Along with the requirement to provide law enforcement for the BCCE, the Desert Conservation Program also constructs infrastructure such as fences to protect covered species and their habitat. Significant habitat destruction from OHV activity within the BCCE has shown a need for restricting illegal OHV use near the northern boundary of the BCCE. This project would provide for the construction of a post-and-cable barrier along most of the north border of the BCCE where a large percentage of the unauthorized OHV traffic originates as well as yet-to-be-determined shorter stretches that will be strategically selected to help reduce unauthorized OHV travel originating from the north.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

While new fencing material exists that may one day replace the current standard materials that are used for post-and-cable fencing, the new material has not yet proven to be more durable than the current standard materials. Until such time that more research can be done, or a smaller area can be completed using an adaptive management approach, fencing projects should continue as a structured decision-making process using the materials that are known to work effectively and have a relatively long life span.

PROJECT GOAL(S):

The project goals are to:

- Increase the effectiveness of conservation actions within the BCCE.
- Protect and preserve the desert habitat for the benefit of MSHCP covered species and other native plants and animals.
- Manage the property and public use to meet conservation obligations and legal requirements.
- Deter the incidents of illegal activities and prohibited uses that occur on the BCCE.

PROJECT OBJECTIVE(S):

- Build 30,000 feet of 3-strand post-and-cable fencing to deter vehicles from entering the BCCE except on designated open roads.
- Create a maintenance road north of the fence on the northern BCCE boundary for vehicle travel during maintenance activities.

PROJECT APPROACH:

This project provides for the construction of a 30,000 foot fence and barrier along the north border of the BCCE.

This project will have 3 phases:

- Phase 1 - Select a construction contractor using the County's bid procedure.

- Phase 2 – Survey and determine the best location for the fencing and barriers.
- Phase 3 – Construct the fencing and cable barrier as per contract documents.

PROJECT COST

$250,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the current permit. This project fulfills permit condition P, which requires the management of the BCCE to protect and manage the desert tortoise and its habitat.

Principle #3 – Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. The BCCE consists primarily of Mojave Desert scrub habitat; approximately 5,106 acres of this habitat were disturbed in Clark County from 2017 to 2019.

Principle #4 - Provides for continued funding of ongoing and effective conservation measures. This project provides for ongoing management of the BCCE.

ROAD WARRIORS

BACKGROUND AND NEED FOR PROJECT:

Desert tortoise mortality and illegal capture along roads and highways has been identified as a significant issue relative to recovery of this species. The construction of roads and highways over the past century has permanently fragmented previously contiguous desert tortoise habitat and reduced connectivity among populations. Restricted movement may limit or entirely prohibit access to suitable habitat, resources, and mates on either side of existing roads and highways. The installation of tortoise fencing to limit mortality and encourage re-colonization of habitat has been recommended, yet many roads throughout desert tortoise habitat remain unfenced.

Installation of permanent desert tortoise exclusion fencing is expensive, ranging from $15,000 to $25,000 per mile, depending on terrain and other factors, resulting in increased costs to state and federal transportation agencies for road repair and construction projects within areas of desert tortoise habitat. Therefore, it is important to use a cost-efficient approach to identifying high-risk areas that should be prioritized for installation of desert tortoise exclusion fencing.

The U.S. Fish and Wildlife Service GIS-based mapping model continues to identify priority areas for installation of permanent desert tortoise exclusion fencing, identify roads in need of systematic surveys, and scheduling of maintenance inspections for existing fencing. Systematically collected road mortality data is necessary to confirm the prioritization of roads by the GIS model and evaluate effects of road mortality to desert tortoise populations. Currently, the U.S. Fish and Wildlife Service has a database of observations of desert tortoise mortalities and live tortoises near or on roads that were opportunistically collected by NDOT staff over a small portion of existing roads between 2015 and 2017 and during the previous pilot projects, described as the "Baseline Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing" and "Road Warriors" in the 2019-2021 Implementation Plan and Budget. These data have been crucial in identifying and properly prioritizing the fencing resources, thus highlighting the need for further systematic surveys to further inform the prioritization model. Data from road surveys could also assist in identifying areas where tortoise abundance may be greater than expected.

There are many miles of roads that occur within desert tortoise habitat in southern Nevada that have not been systematically surveyed, and such surveys conducted by agency staff would be costly and time-consuming. However, systematic surveys conducted by citizen scientist volunteers under the supervision of qualified biologists have so far been shown in the 2019-2021 Road Warriors project to provide a cost-efficient approach to collecting the necessary data while engaging the general public in a meaningful conservation effort.

The pilot project initially consisted of two projects described in the 2019-2021 Implementation Plan and Budget: the "Baseline Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing" and "Road Warriors" projects; these two efforts are being combined under single heading for the purposes of this report since they are most efficiently implemented under a single contract. This next phase of the project would provide funding to cover at least twice the number of miles of systematic surveys compared to what was accomplished during the pilot project.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project is a data collection project designed to validate a model and help prioritize future conservation actions. This project will be useful in determining future mitigation locations and plays a role in the structured decision-making process of installing tortoise exclusion fence along highways.

PROJECT GOAL(S):

There are five goals for this project:

- Engage The Tortoise Group in activities related to conservation and recovery of wild desert tortoises.
- Identify "tortoise hot-zones" that could be prioritized for installation of traffic signage, fencing, and culverts, and demographic population surveys.
- Assist the U.S. Fish and Wildlife Service with further development of the GIS-based model to identify and prioritize roads for installation of tortoise fencing.
- Provide assistance to Nevada Department of Wildlife in collection of road mortality data for the desert tortoise and other species they are responsible for monitoring, and assist with collection of genetic samples for on-going studies and natural diversity archives.
- Further evaluate benefits of tortoise fencing to other species.

PROJECT OBJECTIVE(S):

The objectives for this project are as follows:

- Collect road mortality data to confirm the prioritization of roads by the GIS model and evaluate the effects of road mortality to the desert tortoise population.
- Create maps identifying "tortoise hot-zones" that could prioritize the installation of traffic signage, fencing, and culverts according to demographic population surveys.
- Create a database of data and photos by location for future studies.
- Create a list of trained and reliable citizen scientists for future projects.

PROJECT APPROACH:

Volunteers with The Tortoise Group will be deployed to document observations of tortoise road mortality, live tortoise encounters, carcasses, tortoise burrows, and tortoise sign on or near roads. Photos, GPS location, and condition of carcasses or live tortoise will be recorded and submitted to the U.S. Fish and Wildlife Service and Nevada Department of Wildlife for review. Other data, such as date, time, weather conditions, and habitat quality would be documented as well.

The citizen scientist volunteers will also collect data regarding road mortality of other species observed during surveys, and be trained to collect samples for genetic studies from all observed mortalities, including tortoises, that will be submitted to Nevada Department of Wildlife for their monitoring programs and genetic databases. Road surveys may also be conducted prior to and after installation of desert tortoise fencing to help collect data regarding potential benefits to other species monitored by Nevada Department of Wildlife.

During the inactive season, when tortoises are in brumation (October to March), volunteers will be trained by NDOT maintenance staff to conduct inspections of existing tortoise fencing, fill out reports, and make minor repairs. Observations of major fence damage will be reported to NDOT maintenance staff, who will be responsible for those repairs.

PROJECT COST

$70,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 – Fulfills explicit permit conditions outlined in the Section 10 incidental take permit. Permit condition N requires that the Permittees continue to retrofit, repair, and construct desert tortoise exclusionary fencing along highways in Clark County. This project will aid in the identification and prioritization of locations appropriate for fence installation.

Principle #4. Provides for continued funding of ongoing and effective conservation measures. Desert tortoise exclusion fencing is a highly effective method of preventing roadway mortalities. The successful pilot project demonstrated that this is a highly cost-effective and efficient method of conducting regular minor maintenance on over 450 miles of desert tortoise exclusionary fencing.

Principle # 5. Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will help us meet Goal D2 by helping to maintain stable or increasing populations, as well as, objective D3.1 collaboration with other stakeholders.

RAINBOW GARDENS CONSERVATION

BACKGROUND AND NEED FOR PROJECT:

The U.S. Fish and Wildlife service recently completed a positive 90-day finding in response to list the Las Vegas bearpoppy (*Arctomecon californica*) as endangered, and a species status assessment (SSA) will occur as part of a 12-month finding in the near future. This rare species is endemic to a small subsection of the Mojave Desert, and is most often found in gypsum soils. Recent research conducted by BLM as mitigation for the expansion of a gypsum mine has had very encouraging results with approximately 80 percent of transplanted seedlings surviving after one season and 85 percent of plants flowering in their first year. Rainbow Gardens is a biological Area of Critical Environmental Concern (ACEC) designated as such for its sensitive plant, geological, scientific, cultural, and scenic values. It has been recommended that larger-scale transplantation and seeding trials be conducted at the Rainbow Gardens area since it contains suitable habitat for Las Vegas bearpoppy but is in need of restoration due to habitat disturbance caused by illegal recreational use.

The DCP currently holds no reserve lands with suitable Las Vegas bearpoppy habitat, so in order to provide meaningful positive impacts with this species, it is imperative that we look to lands not managed by the County. The proposed project design and location represent the DCP's most promising opportunity to provide useful assistance with the Las Vegas bearpoppy in Clark County.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

A portion of this project such as fence installation and weed control will follow best management practices and will not require adaptive management at this time. On-the-ground research of germination, as well as efforts to transplant this species, may be served by an adaptive management approach given the low success rate that others have experiences with this species in the past.

PROJECT GOAL(S):

The goal of this project is to contribute to the restoration and conservation of valuable Las Vegas bearpoppy habitat at Rainbow Gardens.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Construct post and cable barriers to protect restoration areas and rare plant habitat
- Restore illegal routes and disturbances to prevent future off-road travel
- Remove invasive species that compete with native vegetation, increase soil salinity, degrade wildlife habitat, and may contribute to hazardous fuel loads
- Conduct Las Vegas bearpoppy germination and transplantation research and implement a monitoring plan

PROJECT APPROACH:

POST AND CABLE CONSTRUCTION

The Rainbow Gardens area is a popular destination for unauthorized activities such as OHV use, shooting, and dumping. As a result, much of the habitat has been degraded, endangering the habitat for Las Vegas bearpoppy and other native species. Installing post and cable barriers along roadways bordering the area will help protect rare plant habitat and restoration areas from damage.

We propose to consult with staff in the BLM Las Vegas Field Office to determine where post and cable barriers are needed most. Up to seven miles of barrier will be installed along roadways that are identified as repeated points of illegal vehicle entry to Rainbow Gardens.

RESTORATION OF ILLEGAL ROUTES AND DISTURBANCES

Due to the delicate nature of the soil structure at Rainbow Gardens, any disruption of the soil results in obvious marks on the land. Vehicle tracks that are visible from busy roadways encourage additional OHV violations and increase the probability that more damage will occur. Such damage can range anywhere from visual degradation of scenic vistas to direct loss of native plants and wildlife by vehicular impact.

We propose to identify highly visible illegal routes and disturbances at Rainbow Gardens and restore them to a more natural state. This will remove the temptation for future off-road travel by giving the appearance of contiguous, undisturbed habitat. It will also restore the functionality of the habitat to support native flora and fauna. Methods may include raking out tracks, surface contouring and imprinting, moving rocks, installing vertical mulch and live vegetation, and addition of materials which will safely restore the original soil surface appearance.

REMOVAL OF INVASIVE SPECIES AND HAZARDOUS FUEL LOADS

Prevalent invasive plant species at Rainbow Gardens currently include salt cedar (*Tamarix ramosissima*, Class C noxious in Nevada), Sahara mustard (*Brassica tournefortii*, Class B noxious in Nevada), and red brome (*Bromus rubens*). All three of these species compete with native vegetation for severely limited resources and degrade wildlife habitat. Salt cedar is known to increase soil salinity, making the soil inhospitable for many native plants. Invasive non-native plant species pose a serious threat to vulnerable habitats due not only to their competing with native species, but also due to their tendency to create dense stands of vegetation that would not otherwise exist in the uplands of the Mojave Desert. Invasive plants in high densities can be a catastrophic source of fuel for the spread of wildfires. Repeated soil disturbance often leaves land vulnerable to invasion by non-native plants, so it is no surprise that areas of Rainbow Gardens have been identified as in need of invasive species removal.

We propose to identify areas within Rainbow Gardens where invasive plant removal would be most feasible and beneficial to native species, including Las Vegas bearpoppy. Methods may include mechanical removal and the use of herbicides approved for use on BLM lands.

LAS VEGAS BEARPOPPY GERMINATION AND TRANSPLANTATION RESEARCH

The Las Vegas bearpoppy has long been the victim of habitat loss and degradation at the hands of such activities as urban development, mining operations, and recreational land uses. Propagation of Las Vegas bearpoppy plants can be used as a tool for conservation and mitigation efforts in degraded habitats with restoration potential. Until recently, attempts to germinate and transplant Las Vegas bearpoppy were largely unsuccessful. However, the recent success of experiments conducted by BLM and researchers at Northern Arizona University has shown that success is in fact possible.

We propose to relocate designated Las Vegas bearpoppy plants and establish permanent study plots. For the purposes of this project, plants will be monitored for three years to document survivorship and phenological stages. Broadcast seeding will also be used in separate plots, and germination and survivorship will be monitored. Plants and/or seed may be available from approved take-permits from development projects, or from an approved population (disjointed lot/strong population) under an approved Scientific Collection Permit.

At sites where restoration transplant and seeding studies are conducted, monitoring for pollinator visitation will also occur. Since the Las Vegas bearpoppy is the primary food source for the Mojave poppy bee (*Perdita meconis*) in Clark County, it is important to investigate whether or not restored Las Vegas bearpoppy habitats provide sufficient ecosystem services to this rare pollinator. Restored and unrestored sites will be observed, and pollinators will be counted and photographed to document visitation.

Seed ecology and germination will also be studied using a series of germination treatments designed to specifically determine the timing and duration of cold-stratification required to break seed dormancy for Las Vegas bearpoppy. Treatments will include setting up a long term *in situ* seed burial in Las Vegas bearpoppy habitat, allowing for yearly seed retrieval, germination observation and viability testing as well as a double germination phenology study. This design will allow for sequential testing of different temperature regimes and stratification durations to precisely determine Las Vegas bearpoppy dormancy break and germination.

An investigation of the relationship between Las Vegas bearpoppy germination and biological soil crusts will also be conducted. Such crusts often co-occur with Las Vegas bearpoppy, and further knowledge of this connection is critical to understanding germination ecology in the field and developing propagation techniques in the lab. To date, mature plants have not been raised in a greenhouse setting. Treatments will involve collection of intact soil crusts and loose gypsum soil to use for seed propagation in a laboratory setting.

PROJECT COST

$3,646,061.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the Section 10 incidental take permit. This project fulfills permit condition J.4 (conservation of low elevation plant species covered by the Permit).

Principle #2 - Responds to recommendations from the Nevada Division of Forestry for actions to mitigate impacts to fully protected flora species. This project has been explicitly requested by NDF and will support the goal of

mitigating impacts to Las Vegas bearpoppy, a fully protected flora species, as well as one of its pollinators by identifying areas where populations of these species exist.

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. This project will focus on mitigation and minimization actions by implementing restoration and research for a MSHCP covered plant species and its habitat while protecting the area from additional damage.

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will support objective D 1.2 and D 1.3 by maintaining existing intact habitat, restoring degraded habitat, and conserving habitat for covered plants. This project will also support objective D 1.4 through removal and control of invasive and non-native plant species and objectives D 3.1 and D 3.2 by fostering collaborations with other stakeholders and promoting responsible recreation.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project is pertinent to the MSCHP because Desert Conservation Program staff can create measurable outcomes such as linear feet of fencing installed and acres of habitat restored.

PIUTE-ELDORADO RESTORATION

BACKGROUND AND NEED FOR PROJECT:

While desert tortoise populations have continued to decline across their range, in recent years data collected from range-wide monitoring efforts indicates that populations in southern Nevada are increasing across nearly all critical habitat units (ranging from 4.4 percent to 22.2 percent per year). The lone exception in southern Nevada is the Eldorado Valley portion of the Piute-Eldorado ACEC. Data from the Desert Tortoise Recovery Office indicates the average rate of decline within the Eldorado Valley is -9.2 percent per year. Therefore, there is a significant need to identify conservation actions that can be implemented to improve habitat conditions and/or augment tortoise populations in the ACEC.

The Desert Tortoise Recovery Office has developed a spatial decision support system (SDSS) that is used to estimate the impacts of threats to desert tortoise populations and to identify and prioritize recovery actions to reduce the impacts of identified threats. Analysis of data from the SDSS shows that the three most significant threats to tortoise populations within the Eldorado Valley are motor vehicles travelling off designated routes, drought, and human access. OHV use across the desert southwest has led to widespread habitat degradation and fragmentation and is one of many factors negatively impacting desert tortoise populations across their range. Within the Eldorado Valley the proliferation of unauthorized routes has continued despite the additional protections afforded to the valley due to its designation as critical habitat and its designation as an ACEC. Thus, the SDSS identifies the following three recovery actions as having the most potential to reduce the impacts of identified threats within the critical habitat unit: restoration of habitat, restoration of roads, and environmental education.

The BLM previously completed analysis of routes within the ACEC and several hundred miles of roads were closed to public access in 2005. Since 2005, many of these routes have continued to be used while new routes have appeared on the landscape. The BLM recently completed a revised route inventory for the Piute-Eldorado ACEC as part of a larger effort to develop an ACEC management plan. The 2019 route inventory identified approximately 580 miles of unauthorized and closed routes, or a total of 725 route segments, within the ACEC where restoration is warranted. This project would provide funding to complete prioritization planning and identify the level of restoration appropriate for each unauthorized or closed route, implement OHV deterrents, conduct intensive restoration in high-use areas, and install signage throughout the ACEC.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

Fence installation and barrier installation, weed control, and replanting will follow best management practices and will not require adaptive management at this time.

PROJECT GOAL(S):

The goal of this project is to restore and enhance desert tortoise habitat within the Piute-Eldorado ACEC.

PROJECT OBJECTIVE(S):

The objectives for this project are as follows:

- Complete NEPA analysis, including any required supporting studies and consultations (e.g., Section 7 consultation, State Historic Preservation Office consultation, etc.).
- Conduct field assessment of all routes proposed for restoration; collect pre-restoration baseline data for post-restoration evaluations.
- Identify appropriate restoration level for each route; prioritize restoration actions; and complete the restoration plan.
- Close up to 725 route segments by installing signage and OHV deterrents (e.g., large boulders, post-and-cable fences, or other similar control measures).
- Conduct intensive restoration treatments on high-use route segments or in areas containing important habitat features.
- Collect post-restoration data.
- Install up to three interpretive kiosks at key locations.

PROJECT APPROACH:

The Desert Conservation Program will partner with BLM to complete restoration activities within the Piute-Eldorado ACEC. U.S. Geological Survey and BLM are currently developing a protocol for route restorations in the California Desert Renewable Energy Conservation Plan area and methods employed during this project will generally follow these draft guidelines.

BLM staff will take the lead in preparing analyses to comply with NEPA and will initiate Section 7 consultation with the U.S. Fish and Wildlife Service to secure a Biological Opinion.

Following completion of all required environmental approvals, a contractor will be selected using standard County purchasing guidelines to prepare the final restoration plan and collect pre-restoration baseline data that will allow for evaluation of restoration treatments once implemented. There are approximately 725 route segments across the ACEC that will be reviewed during the development of the final restoration plan. The restoration plan will identify the appropriate restoration treatment for each road segment and set a priority level that will guide the order in which restoration actions are completed.

Once the restoration plan has been finalized a contractor will be selected using standard County purchasing procedures to implement the restoration plan. Signs will be installed at the termini of all routes identified for closure and OHV deterrents will be used to deter continued use of closed routes. OHV deterrents may consist of vertical mulch, raking or scattering rocks to disguise tracks, installing physical barriers such as post-and-cable fence or large boulders, or other measures as identified in the restoration plan.

Additional restoration treatments may be implemented on route segments that experience the highest levels of unauthorized use or that contain important habitat features in need of additional protection. These additional treatments may include decompaction of soils, use of erosion control fabrics, soil amendments, planting of live plants, or seeding.

After restoration treatments are complete post-restoration data will be collected to aid in long-term monitoring of restoration effectiveness. Long-term monitoring and maintenance of restoration areas will be implemented by BLM.

Finally, interpretive kiosks will be installed at key locations to inform the public of the rules for travelling through the ACEC and to display maps showing the location of open routes.

PROJECT COST

$ 3,663,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. This project will implement restoration actions within Mojave desert scrub habitat which was the most heavily impacted habitat type during the past biennium (5,106 acres of Mojave desert scrub were impacted by development activities).

Principle # 5. Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will help us meet Objective D3.1 collaboration with other stakeholders and D3.2 promote responsible recreation.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project is pertinent to the MSCHP because Desert Conservation Program staff can create measurable outcomes such as linear feet of fencing installed and acres of habitat restored.

Principle #9 - Addresses program goals. This project will address the program goal of restoring desert tortoise habitat.

REPTILE MONITORING SUPPORT

BACKGROUND AND NEED FOR PROJECT:

In 2016, the Desert Conservation Program in collaboration with the Science Advisor Panel developed the Adaptive Management and Monitoring Plan (AMMP). The AMMP established a monitoring framework for all covered species and a decision framework for species that appear to be declining. However, after four years of occupancy data collection on the BCCE, the data was inconclusive regarding population trends for a number of reptile species due to low detection rates. The surveys performed by Nevada Department of Wildlife will provide additional data that can aid with determining trends in reptile populations within Clark County in lieu of conducting reserve unit estimates. This project would also extend our knowledge of Gila monsters, a proposed covered species under the proposed MSHCP amendment, through inventory and monitoring, as well as provide data that could validate or update current and future species models in Clark County.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project could provide data very useful to the Adaptive Management Program for species where we did not have enough data to analyze during the last AMMP review. However, the project itself would not lend itself to an adaptive management approach as it is data collection without a specific management goal.

PROJECT GOAL(S):

The goal of this project is to aid the County during the next AMMP review in determining trends of covered species across Clark County.

PROJECT OBJECTIVE(S):

The objectives of this project are to collect extensive reptile occurrence and monitoring data across Clark County that can be used in determining the current trends of covered species within the county and aid in updating species habitat models during the next iteration of that process.

PROJECT APPROACH:

Nevada Department of Wildlife will hire a biologist to help coordinate and complete the following surveys in Clark County;

- A multi-road network study
- Gila monster inventory and telemetry
- Large-scale presence/absence studies in key areas of diversity

This data will be transferred to the Desert Conservation Program for use in future habitat models and for potential analysis of population trends under the AMMP.

PROJECT COST

$72,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #5. Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project is designed to provide data that can be used in the AMMP analysis to help fill gaps from previous years, and as such, will inform the Adaptive Management Program.

Principle #9. Addresses program goals. This project will address program goals by continuing to expand species monitoring under the Adaptive Management Program.

PREDATOR-PREY DYNAMICS, PHASE III

BACKGROUND AND NEED FOR PROJECT:

Recently, concern has increased regarding the rates and causes of presumed coyote (*Canis latrans*) predation on a translocated population of the federally-listed Mojave desert tortoise (*Gopherus agassizii*) in the BCCE. In 2018 we began a study to look at the abundance, distribution, movement patterns, habitat use, and ecology of coyotes in concert with their primary prey species, the black-tailed jackrabbit (*Lepus californicus*) in the BCCE. Monitoring of predator and prey populations will result in an increased ability to make informed management decisions regarding desert tortoise translocations in the ecological context of larger predator-prey interactions in the BCCE and southern Nevada. The goal of this project is to provide information about predator and prey population dynamics and habitat use and health that is relevant to management of the BCCE as a sustainable habitat reserve and improving success of desert tortoise translocation programs.

In the past several months a disease spillover event occurred in the American southwest. Rabbit Hemorrhagic Disease Virus 2 (RHDV2) escaped from domestic rabbits and has infected 5 native lagomorph species causing dramatic die-offs in six states in the US, and five states in Mexico. The disease is not believed to affect species other than lagomorphs. However, disease and wildlife specialists have conferred extensively, and their primary concerns are: 1) potential prey switching of meso-predators (coyote and kit fox [*Vulpes macrotis*]) and apex-predators (golden eagles [*Aquila chrysaetos*]) with the loss of their primary prey sources; 2) the potential effects of lagomorph die-offs on threatened and endangered species and other species at risk; 3) epidemiological behavior of the virus, e.g., if any lagomorphs acquire immunity or the pattern and timeframe during which die-offs will affect lagomorph populations; 4) how a potential drop in rabbit abundance (as important herbivores) will affect primary production (especially of perennial plants) in habitats across the United States. The two top concerns are entirely consistent with the Clark County project.

The Clark County Predator/Prey Dynamics study is uniquely positioned – first, to answer the original management questions posed by Clark County, and secondly – this project appears to be the only research project with rabbits and coyotes already radio-collared in a location where the disease has presumably not reached. Therefore, this study may capture the events of this disease spillover event in real time and be prepared to capture predicted ecosystem changes that have not been previously quantified during an epidemic of this novel disease outbreak. For the above reasons we are looking to extend this project up to another 4 years to get a better understanding of the predator-prey dynamics of the area, as well as, how this virus may affect all the potentially involved species though a trophic cascade.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

As the project is research-based with no management actions in and of itself this project would not require an adaptive management approach. The project will however, lend results that will inform the adaptive management of current and future population augmentation projects. This project may also provide vital information related to a new virus in lagomorphs which may also lead to an adaptive management approach for addressing the impacts of the virus.

PROJECT GOAL(S):

The goal of this project is to gain a better understanding of predator-prey dynamics between coyotes and their main prey source (leporids) and develop a strategy to limit future desert tortoise translocations from being severely impacted by coyote predation.

PROJECT OBJECTIVE(S):

The objectives for this project are as follows:

- Determine variability in demographics of coyotes and jackrabbits in the BCCE.
- Determine the home range and habitat use patterns of coyotes and jackrabbits.
- Determine the health status and mortality rates for coyotes and jackrabbits.
- Develop methods to obtain reliable density estimates that are cost effective.
- Synthesize jackrabbit abundance and predator densities and movement.

In the event RHDV2 infects rabbits in this study the researchers are to aid the U.S. Geological Survey National Wildlife Heath Center and others in addressing the following concerns in relation to the novel virus in whatever way practical.

- Potential prey switching of meso-predators (coyote and kit fox) and apex-predators (golden eagles) with the loss of their primary prey sources.
- The potential effects of lagomorph die-offs on threatened and endangered species and other species at risk.
- Epidemiological behavior of the virus, e.g., if any lagomorphs acquire immunity or the pattern and timeframe during which die-offs will affect lagomorph populations.
- How a potential drop in rabbit abundance (as important herbivores) will affect primary production (especially of perennial plants) in habitats across the United States.

PROJECT APPROACH:

The project will consist of up to ten one-kilometer survey plots located across the BCCE. Each plot would contain a grid of digital trail cameras. The project would also seek to undertake operations to mark and deploy GPS/VHF collars on 25-36 jackrabbits and similarly capture 10-12 coyotes in the BCCE. Cameras would be maintained to allow for continuous monitoring of the BCCE, via routine maintenance throughout the study. As study animals experience mortalities, GPS/VHF collars will be redeployed on new study jackrabbits to maintain sample size and collect further data. Health assessments will be completed for each animal and a protocol will be setup for the health assessments by the state wildlife veterinarian.

PROJECT COST

$769,841.33

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle # 5. This project is designed to help inform the Adaptive Management Program on factors that may affect translocation and predation of desert tortoises. This project also addresses objectives D 2.1 and D 2.2 in the Biological Goals and Objectives for desert tortoise management and translocation. This project could also result in vital information regarding a new virulent disease and its effects on native rabbit populations which could have indirect negative effects on tortoise populations across their range.

Principle # 9. This project addresses the program goal for augmentation of desert tortoise populations. It will allow for a better evaluation of potential translocation sites and help to determine if any of these sites run the risk of high predation due to increased levels of predators in the area.

RIPARIAN RESTORATION

BACKGROUND AND NEED FOR PROJECT:

Condition K of the incidental take permit stipulates that take of covered avian species is conditioned upon the acquisition of private lands in desert riparian habitats along the Muddy and Virgin rivers and the Meadow Valley Wash. To comply with this permit condition, the Desert Conservation Program has acquired properties along the Muddy and Virgin Rivers to assemble the Riparian Reserve Units. Desert riparian habitats have been significantly reduced in extent by development, agriculture, fire, and the lowering of the local and regional aquifers, and reduced in quality primarily by the invasion of tamarisk. The restoration, creation, and enhancement of desert riparian habitats is necessary for survival of MSHCP covered riparian bird species.

Under this project, the Desert Conservation Program will restore, create, and enhance habitat within the Riparian Reserve Units for the benefit of covered riparian bird species. Restoration efforts on the Reserve Units are ongoing and habitat has been enhanced through fuels reduction, removal of non-native species, and planting of native species. This project will continue the work begun in previous biennia by conducting additional restoration efforts on the Reserve Units.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project is ideal for an adaptive management approach. There are a number of different methods that can be implemented while changing a variety of variables, all of which may have varying levels of success. Continued monitoring of these types of projects will allow us to learn and adapt information to implement projects with a higher success rate in the future.

PROJECT GOAL(S):

The goal of this project is to create, restore, and enhance riparian habitat to benefit covered riparian birds.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Create, restore, and enhance riparian habitat within the Riparian Reserve Units to increase suitable nesting habitat for the southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), and other covered riparian bird species.
- Create, restore, and enhance mesquite/acacia habitat within the Riparian Reserve Units to benefit covered bird species.

PROJECT APPROACH:

Contractors will be hired to conduct the following activities, which may include but are not limited to:

- Site planning and preparation: development of restoration plans, plant collection/propagation/acquisition, nursery development, nonnative species removal, site clearing, and planting area preparation,
- Restoration implementation: outplanting of material, seeding, irrigation installation, and fence installation,
- Post-planting: watering, irrigation maintenance, monitoring, and nonnative species removal.

This project may include the development and/or implementation of restoration plans for priority restoration sites, and monitoring and adaptive management of restored habitats.

PROJECT COST:

$354,500.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. From Spring 2017 through Spring 2019, approximately 245 acres of mesquite/acacia and 19 acres of desert riparian habitat were disturbed.

Principle #4 - Provides for continued funding of ongoing and effective conservation measures. This project provides for ongoing restoration of riparian habitat.

Principle #5 – This project will address Biological Goals and Objectives R1.2 to maintain suitable breeding habitat for MSHCP-covered birds; R1.3 to incorporate elements of natural riparian processes into restoration design and implementation; R1.4 to inventory, remove, and control invasive and non-native plant species; R1.5 to reduce habitat fragmentation and/or improve connectivity and habitat quality through restoration design and implementation; and R4.1 to identify critical uncertainties and address these through planning and adaptive management, when feasible (e.g., land use changes, catastrophic events—fire, climate change).

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project is pertinent to the MSCHP because Desert Conservation Program staff can create measurable outcomes such as number of acres of riparian and mesquite/acacia habitat restored.

Principle #9 – Address program goals, specifically restoration of desert riparian habitat and mitigation of impacts to mesquite/acacia habitat. Managing invasive plant species on the Reserve Units will allow more native species to populate the property and facilitate the natural restoration of desert riparian and mesquite/acacia habitat.

POPULATION VIABILITY ANALYSIS - DATA GAPS FOR RIPARIAN BIRDS

BACKGROUND AND NEED FOR PROJECT:

A population viability analysis (PVA) is a species-specific method of risk assessment that is used to determine how a population will persist over a set number of years. A PVA can estimate the likelihood of a population's extinction and help to identify key life stages and processes that management should focus on to aid recovery. This project would look at the process of developing PVA models and the data that would be required, versus what is currently available, to identify key data gaps for the region. Knowing these gaps can help to refine and focus management actions for MSHCP-covered species. This project can also serve as a template for similar work on other proposed covered species in trying to determine data gaps or in completing a future PVA.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project would be very beneficial to the Adaptive Management Program in determining data gaps for proposed covered species that may aid recovery. This project also serves as a template for future projects that could be adjusted based on the outcome to better achieve the desired results.

PROJECT GOAL(S):

The goal of this project is to gather data and determine the feasibility of completing a regional PVA on current and future covered bird species.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Perform a literature review and gather and summarize existing demographic data for four MSHCP covered bird species:
  - Southwestern Willow Flycatcher
  - Yellow-Billed Cuckoo
  - Ridgway's Rail
  - Arizona Bell's Vireo
- Determine data gaps and additional data needs for the completion of a regional PVA for each species.

PROJECT APPROACH:

The Desert Conservation program will hire a contractor to conduct a literature review and gather available existing data for each species to determine whether a PVA can be completed. Any additional data required to complete the PVA will be summarized for each species. The contractor would be expected to contact regional programs and gather any potentially useable data for each species. The contractor will then determine what level of PVA is possible given the available data and what data would be necessary to either complete the PVA or to

make it more precise or of a higher quality. The contractor will detail these findings for all assigned species in a final report.

PROJECT COST

$50,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project is designed to help inform the Adaptive Management Program on factors that may affect breeding bird species. This project also addresses objectives R 2.1 in the Biological Goals and Objectives to monitor and adaptively manage breeding bird species.

Principle #6 - Responds to the most recent Science Advisor Panel recommendations. This project was submitted by the Science Advisor Panel as a project that would aid in achieving Biological Goals and Objectives.

RIPARIAN THERMAL REFUGIA STUDY

BACKGROUND AND NEED FOR PROJECT:

Many species use daily or seasonal microhabitats, such as shade within trees or inside burrows, to minimize temperature extremes. With current increasing climate trends in temperature, these thermal refugia will become increasingly important. Therefore, thermal refugia will be important for maintaining the viability of riparian bird populations and potentially other MSHCP covered species.

This project would involve identifying areas of potential thermal refugia using remotely-sensed data by collecting daily and seasonal temperature data within specific riparian areas. The availability of thermal refugia could be important in maintaining suitable habitat for MSHCP covered birds and other vertebrates. To determine if riparian birds potentially use thermal refugia as a strategy to avoid or escape critically high temperatures for nesting or foraging, remote temperature monitors may also be placed within appropriate nesting habitat of riparian birds.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project would offer additional data to the Adaptive Management Program and Riparian Reserves project manager about requirements for successful restoration efforts and would aid in developing an inventory of thermal refugia across the reserve units. This project itself would not require an adaptive management approach but results from this project would be used to inform the adaptive management approach of future riparian restoration projects.

PROJECT GOAL(S):

The goal of this project is to identify areas within riparian habitat that act as potential thermal refugia for riparian bird species.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Identify locations of potential thermal refugia within Riparian Reserve Units and other Desert Conservation Program properties as needed.
- Collect temperature data across daily and seasonal time periods.
- Analyze the data for temperature trends.

PROJECT APPROACH:

Desert Conservation Program staff in collaboration with the Science Advisor Panel will develop detailed protocols for establishing transects for placement of temperature monitors based on stratification of habitat and cover types within Riparian Reserves and/or other Desert Conservation Program lands. Monitors will be installed and data will be collected according to developed protocols.

PROJECT COST

$30,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. From Spring 2017 through Spring 2019, approximately 245 acres of mesquite/acacia and 19 acres of desert riparian habitat were disturbed.

Principle #4 - Provides for continued funding of ongoing and effective conservation measures. This project provides for ongoing management of riparian habitat and will inform ongoing and future restoration activities.

Principle #5 - This project will address Biological Goals and Objectives R1.1 to monitor MSHCP-covered species occupancy; R1.2 to maintain suitable breeding habitat for MSHCP-covered birds; R1.3 to incorporate elements of natural riparian processes into restoration design and implementation; R1.5 to reduce habitat fragmentation and/or improve connectivity and habitat quality through restoration design and implementation; and R4.1 to identify critical uncertainties and address these through planning and adaptive management, when feasible (e.g., land use changes, catastrophic events—fire, climate change).

Principle #6 - Responds to the most recent Science Advisor Panel recommendations. This project was recommended for inclusion in the 2021-2023 Implementation Plan and Budget by the Science Advisor Panel.

Principle #9 – Address program goals, specifically restoration of desert riparian habitat. The results of this project will inform restoration activities and is anticipated to improve effectiveness of restoration actions.

RIPARIAN PLANT-POLLINATOR ECOLOGY PHASE II

BACKGROUND AND NEED FOR PROJECT:

Pollination is a vital process for plant reproduction. Knowing and understanding the plant-pollinator systems within the riparian areas in Clark County could improve their function and restoration. One component of riparian restoration is whether the plant populations can be self-sustaining, which may be influenced by pollinator presence/absence and behavior. Also, understanding where pollination is lacking could lead to improved restoration efforts and connectivity.

The Desert Conservation Program is currently funding the first phase of riparian plant-pollinator ecology research which will provide information about plant species richness and reproductive success under various conditions. The second phase of this project will focus on three additional research topics including the ability of current riparian habitat to support pollinators, the most pragmatic planting palettes for restoration, and the pollination strategies employed by our native riparian willow species (*Salix* spp.). The resulting information can be used not only to assess the health of Clark County's riparian lands, but also to better restore and manage riparian properties.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project is not a management action but a research project to better inform future management actions. This project would not require an adaptive management approach but the results will inform the Adaptive Management Program and be used to improve effectiveness of riparian restoration projects.

PROJECT GOAL(S):

The goal of this project is to evaluate the success and sustainability of current management practices as they pertain to riparian plant and pollinator communities, and to determine if opportunities for improvement exist.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Determine if there is sufficient presence of nectar, forage, and host plants to support pollinators throughout the year.
- Observe how revegetating with or without understory plants after clearing tamarisk monocultures influences the resulting plant and pollinator communities.
- Determine if native riparian willow species are pollinated by wind, animals, or some combination of both.

PROJECT APPROACH:

Desert Conservation Program staff will continue to work with researchers from the University of Nevada Las Vegas (UNLV) to execute this project. The work will be completed by a group of UNLV faculty, staff, and students with in-depth expertise in plant and invertebrate species identification and experience in conducting ecological fieldwork in local desert environments. The project will consist of three main activities to achieve project

objectives: (1) pollinator resources study, (2), planting palette outcomes study, and (3) study of willow pollination strategies.

APPROACH FOR POLLINATOR RESOURCES STUDY

As is the case with all animals, pollinators require a multitude of resources, and their needs shift based on the changing seasons and on their life-stages. A healthy pollinator habitat must have a robust and diverse plant community to provide shelter, forage, and nectar resources throughout the year. Study plots will be established and visited repeatedly throughout the course of one year to capture changes over time. Plants will be inventoried and their phenological stages will be recorded to determine the availability of resources. Timed observations of pollinator visitation will be performed and compared across plant species and plots. Data collected from this portion of the project will provide a patch-level indicator of invertebrate usage over time and an individual plant species-based utilization to identify if certain plant species are most important at different times or important for different pollinator functional groups (e.g. bees, flies, etc.).

APPROACH FOR PLANTING PALETTE OUTCOMES STUDY

Tamarisk removal and revegetation with native plants is planned for a large portion of the Mormon Mesa property. Plant palettes will be developed in coordination with the riparian restoration project manager to establish 6-8 experimental plots, half of which will be planted with native trees and understory plants, and the other half of which will be planted with native tree species only. Data collection will begin one to three years after revegetation occurs to give plants time to establish in their new environments. An inventory of plant species and pollinator presence/abundance will be conducted to compare the effects of the differing planting schemes on the development of plant and pollinator communities in newly restored riparian areas.

APPROACH FOR STUDY OF WILLOW POLLINATION STRATEGIES

Willow species in the American southwest are considered wind-pollinated, and so are considered to not be dependent upon animal pollinators for their reproduction. However, willow species in other parts of the world have been found to exhibit a mixture of wind- and animal-facilitated pollination strategies, even within the same species. To more specifically address whether planted willows can be self-sustaining and if pollinator presence is important for the longevity and resilience of riparian habitats, a sample of willow flowers will be isolated from pollinators using a loose sack of a sheer tight-weave fabric. This treatment will not limit wind pollination, and it will reduce likelihood of pollination by invertebrates. Plants will be observed to fruit maturity and, if possible, seed will be collected from covered and not covered fruit to conduct seed viability testing.

PROJECT COST

$75,105.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. Habitat at the Riparian Reserve Units is maintained and

restored as mitigation for the take of desert riparian bird species and their habitat through development activities authorized by the incidental take permit.

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. Specifically, this project will help address objectives R1.4 by helping to incorporate natural riparian processes into restoration, and R4.1 identifying critical uncertainties.

Principle #6 – Responds to the most recent Science Advisor recommendations. This project was recommended by the Science Advisor Panel.

Principle #9 – Addresses program goals. This project addresses the goal of restoration of desert riparian habitat by providing insight to maximize restoration success. This project also addresses the goal of continuing to expand species and habitat monitoring under the Adaptive Management Program.

INVESTIGATE SCREWBEAN MESQUITE DIE-OFFS

BACKGROUND AND NEED FOR PROJECT:

Screwbean mesquite (*Prosopis pubescens*) is an iconic tree species of riparian woodlands in the arid southwest. As a foundational species in the ecosystems where it occurs, screwbean mesquite provides critically important wildlife habitat, supports a diversity of insect pollinators, and is culturally significant to indigenous peoples. In California, the endangered least Bells' vireo (*Vireo bellii pusillus*) often nests in screwbean mesquite trees as well as the MSHCP covered Arizona Bell's Vireo (*Vireo bellii*). Mesquite is also an important habitat for other species covered under the MSHCP.

Since approximately 2005, screwbean mesquite trees have been experiencing rapid and synchronous die-offs, often in large patches. The extent and causes of this phenomenon remain unknown.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project will inform the Adaptive Management Program and assist with developing a better approach to future mesquite restoration projects. Currently, the project is research based and would not lend itself to an adaptive management approach; however, subsequent phases of the project may work better under adaptive management framework.

PROJECT GOAL(S):

The goal of this project is to identify the cause(s) of the screwbean mesquite die-off, to determine the extent of the die-offs, and to forecast where they may occur next.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Map existing die-offs and develop models for forecasting future die-off areas using remote sensing technology and regional agency networks
- Identify the possible causes of die-off
- Identify resistant traits/trees for potential use as propagule sources

PROJECT APPROACH:

Desert Conservation Program staff will work with researchers from the UNLV (or a similar research institution) to execute this project. The work will be conducted by individuals with in-depth expertise in species identification and experience in conducting ecological fieldwork in local desert environments. The project may combine existing plots on NPS land with a broad survey of County and adjacent agency land to assess the proportion of trees dying (if any trees have died) and relate spatial variability in mortality to other field measured data. Core samples from mesquites may be collected to estimate age and evaluate if climatic change is a possible influence. General soil analyses may be conducted to determine if pathogens are present that may be a factor in the die-offs. A potential

project output could provide data on long-term persistence of mesquite from the subset of permanent plots, whether presence of mesquite seedlings indicative of recruitment may be sufficient or not to replenish lost individuals, and a model of the proportion of dead trees across Clark County linked with potentially mappable features.

PROJECT COST

$125,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. From spring 2017 through spring 2019, approximately 245 acres of mesquite/acacia habitat were disturbed on private land.

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. Specifically, this project will help address objective R4.1 identifying critical uncertainties.

Principle #9 - Addresses program goals. This project addresses the goal of mitigating impacts to mesquite/acacia habitat.

RARE PLANT PROPAGATION, PHASE II

BACKGROUND AND NEED FOR PROJECT:

Clark County is home to a number of rare plant species, several of which are MSHCP covered species (Table 1), thus the Desert Conservation Program has a need to actively conserve and manage these populations, where feasible. Additionally, the U.S. Fish and Wildlife Service recently completed a positive 90-day finding in response to list the Las Vegas bearpoppy and threecorner milkvetch as endangered, further highlighting the need to develop restoration techniques for these species.

The Desert Conservation program funded research (in progress) during the 2019-2021 Implementation Plan and Budget to investigate propagation techniques and the feasibility of establishing nursery populations for these species. This next phase of research will allow us to utilize plant materials being developed during the first phase to investigate outplanting techniques which can be used to respond to landscape-scale disturbances such as invasive species infestations and altered fire regimes. This research may also assist with species recovery by increasing availability of seed and nursery stock which can be used to mitigate for the loss of valuable habitats.

Table 1
Target Species

Common Name	Scientific Name	Fully Protected by Nevada	Covered by Clark County MSHCP
Las Vegas bearpoppy	*Arctomecon californica*	x	x
Threecorner milkvetch	*Astragalus geyeri* var. *triquestrus*	x	x
Blue Diamond cholla	*Cylindropuntia multigeniculata*	x	x
Sticky buckwheat	*Eriogonum viscidulum*	x	x
White-margined beardtongue	*Penstemon albomarginatus*		x

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This would be a research project to better inform the Desert Conservation Program on how to augment rare plant populations within Clark County. This project will be helpful in developing strategies for upland restoration in the future, and those actions would follow an adaptive management approach.

PROJECT GOAL(S):

The goal of this project is to build upon current research for propagation and restoration of rare flora in Clark County in order to assist with species recovery and mitigation efforts.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Characterize Las Vegas bearpoppy seed bank densities using the greenhouse emergence method.
- Use greenhouse germinated Las Vegas bearpoppy seedlings to test propagation practices.
- Augment threecorner milkvetch and sticky buckwheat seed availability for conservation.
- Conduct field trials on threecorner milkvetch to promote seedling germination and development into mature seed-bearing adults.

- Use Blue Diamond cholla plant materials developed for the County (in progress) to test practices that maximize outplanting success.
- Collect rootstock and/or salvage adult white-margined beardtongue plants in the field and test nursery practices for producing robust plants for reintroduction into suitable habitats.

PROJECT APPROACH:

LAS VEGAS BEARPOPPY

Many desert plants maintain a reserve of seeds in the soil surface that promote reestablishment of populations when conditions are optimal for germination and seedling growth. This soil seed bank is important for persistence of short-lived species such as Las Vegas bearpoppy, yet the fates of seeds once they drop from the parent plants and enter the soil is poorly understood. Emerging research is investigating seed longevity in the soil, propagation of seedlings from seeds, pollination by the poppy bee, and transplanting within native habitat (T. Pereira, Desert Research Institute, pers. comm.). While previous work has shown that random sampling of surface soils during a single year yielded low seed densities, a more directed sampling approach across multiple years and in combination with mapping of habitat attributes would inform managers of the dynamic nature of seed distribution across vulnerable habitats. We propose to sample Las Vegas bearpoppy seed bank systematically (i.e., distance gradient from adult plants) and across several years to characterize seed bank densities using a greenhouse emergence method. This method uses a series of watering and chemical treatments for desert species and will be adapted to include cold stratification, which is likely important for breaking seed dormancy for this species. The resulting germinants will be used to test propagation practices for developing plant stock from seed bank (e.g. native vs. nursery soils, temperature and watering schedules, and/or applying dilute fertilizers with elemental ratios).

THREECORNER MILKVETCH AND STICKY BUCKWHEAT

Very little is known about the ecology of the desert annuals threecorner milkvetch and sticky buckwheat, yet soil seed banks are largely important for conserving rare annual species that spend the majority of their life as seeds. Recent petitioning of threecorner milkvetch in particular under the Endangered Species Act highlights the concern that multiple threats are causing dramatic losses of individuals and fragmenting remaining habitats. Current U.S. Geological Survey research on threecorner milkvetch and sticky buckwheat is unraveling aspects of seed ecology – seed viability, dormancy, longevity, and soil seed bank – and breeding system. But the first of two years of the study highlights the variability of seed produced during boom and bust years for annual species. Given the urgency of habitat loss for these annual species, we propose to augment threecorner milkvetch and sticky buckwheat seed availability for conservation through collections of seed obtained directly (from adult plants within their habitats) and indirectly (from plants matured from seed bank that was collected from habitat). By augmenting collections across multiple years and sites, we will capture the genetic and phenological variability in seed production following conservation guidelines for use in species recovery. In addition, we will conduct field trials on threecorner milkvetch to promote seedling germination and development into mature seed-bearing adults. Treatments may include outplanting nursery-raised seedlings, supplemental watering in habitats with known seed bank, and supplemental watering in combination with seeding.

BLUE DIAMOND CHOLLA

Ongoing U.S. Geological Survey research is determining the propagation potential of Blue Diamond cholla from joint cuttings and from seeds, but procedures for optimizing outplanting success are not known for this cactus species. We propose to use Blue Diamond cholla plant materials developed for the County (Project 2019-USGS-1990A) to test practices that maximize outplanting success. Potential practices include varying the season of outplanting, use of nurseplants, protection from herbivores, and/or supplemental watering. In coordination with BLM, this effort may require additional joint and seed collections to represent the genetic variability in multiple populations of Blue Diamond cholla (only Blue Diamond Hill is currently represented).

WHITE-MARGINED BEARDTONGUE

Current U.S. Geological Survey efforts are underway to understand the propagation potential for white-margined beardtongue through seed ecology and breeding system studies, but little work has focused on vegetative propagation through rootstock or plant salvage. We propose to collect rootstock and/or salvage adult plants in the field and test nursery practices for growing robust white-margined beardtongue plants for reintroduction into habitat. Previous efforts have suggested that 1) native sandy soil is more favorable for growth than conventional nursery soils, and 2) transplant success may be optimized when nursery stock has a balance between sufficient tuber growth and plant age. We will test an array of nursery growth conditions that may include but are not limited to: varying pot depths, soil mixtures (native soils vs. nursery soils), initial tuber size and/or salvage plant size. We will evaluate success of outplanting the resulting plants into experimental gardens or if approved, in its natural or proposed habitats (pending permission from BLM).

PROJECT COST

$628,573.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the Section 10 incidental take permit. This project fulfills permit condition J.4 (conservation of low elevation plant species covered by the Permit).

Principle #2 - Responds to recommendations from the Nevada Division of Forestry for actions to mitigate impacts to fully protected flora species. This project has been explicitly requested by NDF and will support the goal of mitigating impacts to all of the fully protected flora species of Clark County.

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. This project will provide additional mitigation options for protected plant species habitat by identifying techniques by which protected plant populations can be supplemented, re-established, or translocated.

Principle #8 – Advances the amendment of the MSHCP and its conservation strategy. This project will provide information necessary to develop a robust conservation strategy that effectively mitigates impacts to covered plant species.

BLUE DIAMOND CHOLLA SURVEYS

BACKGROUND AND NEED FOR PROJECT:

Previous Desert Conservation Program funding resulted in the first habitat model for the critically endangered Blue Diamond cholla (*Cylindropuntia multigeniculata*). With a relative paucity of observations compared to many species for which models have been developed, it is reasonable to predict that either the habitat model covers vast swaths of land that may be unsuitable for occupancy, or the model may aid in drastically increasing the known occurrences of the species. The Desert Conservation Program is currently funding surveys for multiple protected plant species in the region, but more targeted surveys for Blue Diamond cholla are warranted.

Targeted surveys will quickly and efficiently increase the knowledge base for the species and will allow the Desert Conservation Program and other stakeholders to better determine the parameters of habitat preferences and range of Blue Diamond cholla. This information will be valuable in strengthening habitat models for future use in planning effective management and mitigation actions.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project would provide greater knowledge about locations that can be used in modeling as well as a better understanding of habitat preference and how to locate areas that may be suitable for Blue Diamond cholla propagation. This project would not require an adaptive management approach.

PROJECT GOAL(S):

The goal of this project is to conduct targeted field surveys in modeled Blue Diamond cholla habitat and gain information concerning the habitat preferences and range for this rare species. Areas lacking previous survey history will be the primary focus.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Identify areas of high survey priority based on presence or absence of previous survey information in combination with current land status and habitat prediction models.
- Perform targeted Blue Diamond cholla surveys during the appropriate survey seasons

PROJECT APPROACH:

Desert Conservation Program staff will consult with agencies including The Nevada Division of Forestry to determine the scope and scale of the survey effort to be implemented. Survey methods will be based on protocols developed by the BLM and the NNHP and may involve a combination of full coverage surveys and intuitive controlled surveys so the most time is spent in areas with the highest potential for supporting Blue Diamond cholla.

PROJECT COST

$360,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the Section 10 incidental take permit. This project fulfills permit condition J.4 (conservation of low elevation plant species covered by the Permit).

Principle #2 - Responds to recommendations from the Nevada Division of Forestry for actions to mitigate impacts to fully protected flora species. This project has been explicitly requested by Nevada Division of Forestry and will support the goal of mitigating impacts to Blue Diamond cholla, a fully protected flora species, by identifying areas where populations of this species exist.

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. This project will focus on minimization actions by providing information as to where protected plant species are located. Areas where these species are located can then be avoided during land disturbing activities.

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will support objective D 1.2 and D 1.3 by helping to locate and maintain intact existing habitat and protect and conserve habitat for covered plants.

Principle #8 - Advances the amendment of the MSHCP and its conservation strategy. This project supports advancement of the amendment by identifying areas that are suitable for future development as well as those that are not.

SURVEYS FOR GYPSUM ENDEMICS

BACKGROUND AND NEED FOR PROJECT:

The U.S. Fish and Wildlife Service recently completed a positive 90-day finding in response to list the Mojave poppy bee (*Perdita meconis*) as endangered. The species will undergo a species status assessment as part of a 12-month finding in the near future. In Clark County, the Mojave poppy bee specializes in the collection of pollen from only one species, the critically endangered Las Vegas bearpoppy (*Arctomecon californica*). Surveys for both of these species on BLM lands are currently funded and will continue for at least the next two years. Adjacent public lands also need to be surveyed in order to get a complete picture of species distributions and status. Expanding known occurrences could support effective habitat connectivity and conservation activities, and potentially reduce the need for future listing efforts.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project provides vital information that will be useful in the listing decision of the poppy bee and will aid the Desert Conservation Program in further model refinement in the future. Since the project only involves surveys it would not require an adaptive management approach.

PROJECT GOAL(S):

The goal of this project is to increase our understanding of the distribution and abundance of the state listed Las Vegas bearpoppy and the Mojave poppy bee in Clark County. Additional species endemic to gypsum habitats may be included in the project to increase efficiency. The survey data will contribute to the U.S. Fish and Wildlife's decision of whether or not federal protections are warranted while improving local and regional management of these species.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Utilize existing habitat suitability models, historical records, and local knowledge to identify undersurveyed areas adjacent to BLM lands that have habitat suitable for Las Vegas Bearpoppy.
- Perform targeted Las Vegas bearpoppy and Mojave poppy bee surveys during the appropriate survey seasons.

PROJECT APPROACH:

Although the Las Vegas bearpoppy is often thought of as a gypsophile, herbarium records show that this species can be found on other soil types as well. In addition to habitat suitability models, historical records and local knowledge will be employed to determine the best locations to conduct surveys.

Surveys will take place during the spring months when Las Vegas bearpoppy is in bloom. Public lands adjacent to those surveyed on BLM land will be surveyed to document Las Vegas bearpoppy occurrences. Areas occupied by

Las Vegas bearpoppy will be considered suitable for Mojave poppy bee surveys due to this pollinator's specialist nature.

Desert Conservation Program staff will consult with agencies including the BLM, U.S. Fish and Wildlife Service, and the National Parks Service to determine the scope and scale of the survey effort to be implemented. Survey methods will be based on approved protocols developed by the BLM and U.S. Fish and Wildlife Service.

PROJECT COST

$100,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 - Fulfills explicit permit conditions outlined in the Section 10 incidental take permit. This project fulfills permit condition J.4 (conservation of low elevation plant species covered by the Permit).

Principle #2 - Responds to recommendations from the Nevada Division of Forestry for actions to mitigate impacts to fully protected flora species. This project has been explicitly requested by Nevada Division of Forestry and will support the goal of mitigating impacts to Las Vegas bearpoppy, a fully protected flora species, as well as one of its pollinators by identifying areas where populations of these species exist.

Principle #3 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is occurring and those species impacted. This project will focus on mitigation actions by providing information as to where protected plant species and potentially protected insect species are located. Areas where these species are located can then be monitored and protected.

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will support objective D 1.2 and D 1.3 by helping to locate and maintain intact existing habitat and protect and conserve habitat for covered plants.

NILES HERBARIUM DATA

BACKGROUND AND NEED FOR PROJECT:

The NNHP is one of the main sources for agencies and consultants when checking risks of conflict and evaluating impacts of projects to protected species. The NNHP data repository saves agencies time and money when evaluating projects by not having to locate and gain access to each agencies' source of information separately as well as not having to spend time formatting all the collected data into a consistent format. Data from NNHP has proven very valuable in a number of projects within the Desert Conservation Program including recent projects like the development of species habitat distribution models.

Recently, The Wesley E. Niles Herbarium at the UNLV School of Life Sciences, digitized their entire herbarium consisting of 65,000 specimens of vascular plants and more than 1,600 species. This collection contains plants from all over Nevada which could be very beneficial to agencies and consultants working with these species. Therefore, the incorporation of the herbarium data of all MSHCP covered species would be of benefit to the Desert Conservation Program and the conservation community.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

While this project could be very beneficial to the Desert Conservation Program and the Adaptive Management Program by providing additional data to use in modeling efforts, the project itself does not require an adaptive management approach.

PROJECT GOAL(S):

The goal of this project is to increase the usefulness of the NNHP database and gain access to a large set of data related to MSHCP covered species.

PROJECT OBJECTIVE(S):

Incorporate all MSHCP covered species records, all Heritage Program Track-List species records, and all Heritage Program Watch-List species records from the Niles Herbarium into the database.

PROJECT APPROACH:

NNHP will retrieve all data from the Niles Herbarium and format it for input into their database. NNHP will perform quality control/quality assurance to ensure that all data is accurate and that the georeferencing for each data point is correct.

PROJECT COST

$60,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #2. Responds to recommendations from the Nevada Division of Forestry for actions to mitigate impacts to fully protected flora species. This project has been explicitly requested by Nevada Division of Forestry as partial mitigation for impacts to state-listed plants.

Principle # 5. Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will make additional species occurrence data available for use in modeling, monitoring, and other efforts advanced under the Adaptive Management Program.

PERMIT AMENDMENT – VEGETATION MAP, PHASE II

BACKGROUND AND NEED FOR PROJECT:

As administrator of the MSHCP, the Desert Conservation Program is required to monitor habitat loss and conduct a wide range of analyses to support the goals of the program. A vegetation-based ecosystem GIS dataset provides the baseline for inventory, monitoring, and research activities conducted in support of the program. The original County Ecosystem Map was developed from the 1996 GAP land cover data and was modified to include mesquite/acacia polygons developed by the BLM in 1997. This Ecosystem Map was updated in 2011, incorporating the SWReGAP dataset to further refine the 11 previously defined ecosystems. Since the last update to the dataset in 2011, changes to vegetation have occurred and methods for developing vegetation-based datasets have improved. Accurate and up-to-date vegetation maps are essential to land use planning and resource management.

This is a continuation of a project that began in 2020 with an expected completion in June 2025. Additional funding for this project is expected to come from other sources. Vegetation will be mapped to the Alliance level and the final product will comply with standards set forth by the U.S. National Vegetation Classification System, *Guide to the National Vegetation Classification Standard, Version 2* (Federal Geographic Data Committee, 2008).

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project would be useful to the Desert Conservation Program by providing a more detailed and accurate map of vegetation communities within the County; this will aid with monitoring and in determining the focus of future conservation actions. It would also aid the Adaptive Management Program by helping to create more detailed models for use in evaluating projects to determine when adaptive management is necessary.

PROJECT GOAL(S):

Produce an updated, finer-scale vegetation-based ecosystem map that covers the extent of Clark County.

PROJECT OBJECTIVE(S):

The project objectives are as follows:

- Classify vegetation communities into a U.S. National Vegetation Classification hierarchy.
- Conduct vegetation sampling to classify vegetation and to assess map accuracy.
- Produce a final vegetation map with units mapped to the Alliance level.

PROJECT APPROACH:

This project builds on previous work initiated in 2019 to map Clark County vegetation communities to the Group level in accordance with the U.S. National Vegetation Classification System. Field crews consisting of experienced botanists will conduct vegetation sampling. Data from vegetation sampling will be used to conduct an accuracy assessment of the preliminary vegetation map and to further refine the map. This project will use the same approach that has been used to map vegetation in the Lake Mead National Recreation Area. The final map

will cover approximately 4,185,089 acres within Clark County, excluding Department of Defense Land and the previously completed portions of Lake Mead National Recreation Area.

PROJECT COST

$606,303.84

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project informs the Adaptive Management Program because it will result in development of a new vegetation map that will be used to refine species distribution models, monitor impacts, and evaluate conservation actions.

Principle #6 - Responds to the most recent Science Advisor Panel recommendations. This project would address all, or portions of, three separate funding recommendations submitted by the Science Advisor Panel: Map Desert Riparian Areas and Corridors within Clark County; Map Mesquite/Acacia and Playa Areas within Clark County; and Develop Accuracy Assessment of Ecosystem or Vegetation Mapping of Clark County Properties.

Principle #8 - Advances the amendment of the MSHCP and its conservation strategy. This project supports advancement of the amendment by providing a fine-scale vegetation map that will identify baseline vegetation conditions within the Plan Area.

PERMIT AMENDMENT SUPPORT

BACKGROUND AND NEED FOR PROJECT:

The MSHCP Permittees have been pursuing a formal amendment to the Clark County MSHCP and Section 10 incidental take permit since 2007. The primary reasons for pursuing this amendment are to 1) increase the amount of take authorized by the permit to provide coverage for lands that are currently available for development or may become available in the future, 2) to revise the list of species covered by the permit, 3) to revise the conservation strategy, and 4) to increase the permit term to 50 years. This project would provide funding for supporting analyses necessary for the permit amendment application as well as consultants that will aid the County in preparing application documents and any associated agreements, management plans, or supplemental analyses.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

While not directly related to the Adaptive Management Program, amending the MSHCP and associated incidental take permit has the potential to change the scope and or process of the Adaptive Management Program in the future.

PROJECT GOAL(S):

The goal of this project is to prepare a revised MSHCP and associated application materials and environmental analyses to obtain an amended incidental take permit.

PROJECT OBJECTIVE(S):

The goal of this project will be achieved through several contracts as described below:

- Habitat Conservation Planning Consultant - Continue to fund the contract with the Habitat Conservation Planning consultant to assist the County with preparing the amended MSHCP and associated documents and analyses.
- Funding Analysis – This task will involve conducting a funding analysis to estimate the financial costs of the management and implementation of the amended MSHCP, including costs associated with implementing the minimization measures outlined for the proposed covered species within specified habitat types, mitigation measures for the proposed reserve system strategy, and the costs of the monitoring and adaptive management strategy outlined for the proposed amended MSHCP.
- Outside Legal Counsel - Will provide advocacy and legal advice and services to the Permittees, conduct critical reviews of draft documents, and assist with the preparation of legal agreements.
- Third-party NEPA Consultant. This consultant will be jointly selected by the Permittees and the U.S. Fish and Wildlife Service to prepare an Environmental Impact Statement, which will be required to issue an amended incidental take permit and to meet regulatory requirement under NEPA.

PROJECT APPROACH:

Required components of the amendment application will be completed in cooperation with outside consultants. Once draft documents have been prepared, staff will work with U.S. Fish and Wildlife Service to coordinate internal review and publication for public comment. Following public comment periods, staff and consultants will coordinate document revisions with the U.S. Fish and Wildlife Service and other stakeholders to develop a final amended MSHCP, prepare implementing agreements, and/or execute cooperative management agreements.

PROJECT COST

$300,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #8 – Advances the amendment of the MSHCP and its conservation strategy. The purpose of this project is to advance the MSHCP amendment by providing for all necessary actions and supporting analyses.

U.S. 95 TELEMETRY STUDY

BACKGROUND AND NEED FOR PROJECT:

Roads are a mainstay on the landscape throughout America and in southern Nevada; however, roads can have a significantly negative effect on desert tortoise populations. Roads directly result in increased mortality and population depletion adjacent to the roadways. They also contribute to reduced connectivity and gene flow from one side to the other. One solution to the mortality problem has been to install fences in order to keep tortoises off roadways and allow for that habitat to be utilized. This solves the mortality issues but still leaves the issues of connectivity and gene flow unaddressed. Culverts are in place to allow water to flow from one side of the road to the other but very little is known about how tortoises may use these culverts for connectivity. This project will help examine how tortoises use culverts and whether tortoises will incorporate them as a movement corridor within their habitat.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project would require an adaptive management approach. The point of this project is to try to reduce the uncertainty of connectivity across roadways by translocating tortoises nearby. These tortoises will need to be monitored closely and enough data will need to be collected in order to determine if this is a viable translocation strategy in the future. This could help answer two questions: 1) where to establish augmentation sites, and 2) how to increase functional connectivity across roadways that have been separated by fencing.

PROJECT GOAL(S):

The goal of this project will be to determine how tortoises utilize box culverts on the landscape.

PROJECT OBJECTIVE(S):

The objectives of the project are to determine how translocated tortoises and resident tortoise differ in their use of culverts on the landscape and to determine if translocating tortoises near culverts is a viable strategy to increase long-term demographic connectivity.

PROJECT APPROACH:

Telemetry will be conducted year-round to track the movement patterns of tortoises next to U.S. 95 in northwestern Clark County. Telemetry location data will be collected once per month between November and February and then weekly between March and October. Radiotelemetry will be conducted on up to 20 tortoises that have been previously translocated to the area, with up to 20 additional resident tortoises to be ratiotracked as well.

For each location, the observer will record the date, time, tortoise identification number, temperature, GPS location, and behavior. GPS data loggers will be kept on each tortoise in the study through the active season of March through October. Units will be set to collect hourly data during periods when the tortoise is expected to be active.

PROJECT COST

$300,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #5 - Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project will support Biological Objectives 2.1 monitor and adaptively manage for desert tortoise populations, D2.2 augment populations through translocation, D 3.1 collaborate with other stakeholders on project/mitigation work, and D 4.1 identify critical uncertainties and address these through planning and adaptive management.

Budget Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project has a measurable outcome and is pertinent to the MSHCP.

Budget Principle #9 - Addresses program goals. This project will allow for a better understanding of how translocated tortoises use culverts as part of their home range and may assist with identifying new areas for augmentation while increasing functional connectivity in the process.

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ATTACHMENT D

Biological Goals and Objectives

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The following biological goals and objectives were developed in 2016 by the Adaptive Management Program in collaboration with the Science Advisor Panel. A copy of the complete report is available on the Desert Conservation Program website at: http://www.clarkcountynv.gov/airquality/dcp/Pages/OtherAdaptiveMgmtReports.aspx.

RIPARIAN BIOLOGICAL GOALS AND OBJECTIVES

Goal R 1. Maintain, improve, and expand habitat for the MSHCP-covered species on riparian reserve system lands

Objectives:

R 1.1: Monitor MSHCP-covered species occupancy

R 1.2: Maintain and/or increase suitable breeding habitat for MSHCP-covered birds

R 1.3: Incorporate elements of natural riparian processes into restoration design and implementation

R 1.4: Inventory, remove, and control invasive and non-native plant species

R 1.5: Reduce habitat fragmentation and/or improve connectivity and habitat quality through restoration design and implementation

R 1.6: Acquire riparian property at an equivalent rate as take (i.e., habitat conversion)

Goal R 2. Maintain stable or increasing populations of federally-listed threatened and endangered (T&E) species on riparian reserve system lands

Objectives:

R 2.1: Monitor and adaptively manage for breeding bird populations

Goal R 3. Foster community and stakeholder engagement to benefit covered species

Objectives:

R 3.1: Collaborate with other stakeholders on project/mitigation work (e.g., agencies, Permittees)

R 3.2: Promote responsible recreation (e.g., signage, education)

Goal R 4. Promote ecological resiliency on riparian reserve system lands

Objectives:

R 4.1: Identify critical uncertainties and address these through planning and adaptive management, when feasible (e.g., land use changes, catastrophic events—fire, climate change)

R 4.2: Identify critical connectivity corridors for covered species and prioritize acquisition and/or conservation where feasible

DESERT UPLAND BIOLOGICAL GOALS AND OBJECTIVES

Goal D 1. Maintain, improve, and expand habitat for MSHCP-covered species on desert upland reserve system lands

Objectives:

D 1.1: Monitor MSHCP-covered species occupancy

D 1.2: Maintain existing intact functioning habitat and restore degraded habitat (use Objective D 1.1 to determine if habitat qualifies as functioning)

D 1.3: Protect and conserve habitat for covered plants (i.e., physical protection of plants with specific requirements)

D 1.4: Inventory, remove, and control invasive and non-native plant species

D 1.5: Reduce habitat fragmentation and/or improve connectivity through restoration design and implementation

Goal D 2. Maintain stable or increasing populations of Federal T&E-listed species on desert upland reserve system lands

Objectives:

D 2.1: Monitor and adaptively manage for desert tortoise populations

D 2.2: Augment populations through translocation programs when appropriate

Goal D 3. Foster community and stakeholder engagement to benefit covered species

Objectives:

D 3.1: Collaborate with other stakeholders on project/mitigation work (e.g., agencies, Permittees)

D 3.2: Promote responsible recreation (e.g., signage, education)

D 3.3: Provide law enforcement within reserve system

D 3.4: Educate project proponents and construction personnel about procedures for reporting desert tortoises that occur on project sites and provide a mechanism for collection and relocation of tortoises in collaboration with the US Fish and Wildlife Service

Goal D 4. Promote ecological resiliency on desert upland reserve system lands

Objectives:

D 4.1: Identify critical uncertainties and address these through planning and adaptive management, when feasible (land use changes, catastrophic events—fire, climate change)

D 4.2: Identify critical connectivity corridors for covered species, prioritize conservation and/or acquisition of corridors, and increase permeability for species movement where feasible.

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ATTACHMENT E

Funding Recommendations and Responses

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Agency	Funding Recommendation	Desert Conservation Program Response
U.S. Fish and Wildlife Service	The U.S. Fish and Wildlife Service recently completed a positive 90-day finding in response to list the Mojave poppy bee as endangered. The species will undergo an SSA as part of a 12-month finding in the near future. The BLM is funding species surveys for the next 2-3 years, but these funds can be used for surveys only on BLM managed lands. A nominal amount of additional funding from the MSHCP would allow for researchers to extend survey efforts onto non-BLM lands located in Clark County (e.g., National Park Service lands).	Agreed. Funding for this work is included in Concept #22, Surveys for Gypsum Endemics.
U.S. Fish and Wildlife Service	The U.S. Fish and Wildlife Service recently completed a positive 90-day finding in response to list the Las Vegas bearpoppy as endangered. The species will undergo an SSA as part of a 12-month finding in the near future. Recent studies successfully transplanted Las Vegas bearpoppy individuals, and plants survived, flowered, and maybe even seeded. The next step would be to scale up and fund larger scale restoration sites at Rainbow Gardens (or similar area).	Agreed. Funding for this work is included in Concept #11, Rainbow Gardens Conservation.
U.S. Fish and Wildlife Service	The U.S. Fish and Wildlife Service recently completed a positive 90-day finding in response to list the threecorner milkvetch as endangered. The species will undergo an SSA as part of a 12-month finding in the near future. Threecorner milkvetch is declining in areas invaded by Sahara mustard and invasive species were identified as a substantial threat in the finding. We need a better understanding related to how this invasive species might interact and potentially outcompete native species, as well as techniques for removal of mustard and successful reestablishment of the milkvetch.	Agreed. Funding for this work is included in Concept #20, Rare Plant Propagation, Phase II.
U.S. Fish and Wildlife Service	Construct post-and-cable fencing in select areas of the Sunrise Mountain Special Recreation Management Area to deter unauthorized recreation activities and protect sensitive biological (e.g., Las Vegas bearpoppy individuals and habitat) and geological resources.	Agreed. Funding for this work is included in Concept #11, Rainbow Gardens Conservation.

Agency	Funding Recommendation	Desert Conservation Program Response
U.S. Fish and Wildlife Service	Continue to identify and fund projects to develop vegetative restoration techniques to effectively respond to landscape-scale disturbances (e.g., invasive species and altered fire regimes) in the Mojave Desert. May also assist with species recovery by increasing availability of native seeds, and increase opportunities for restoring damaged habitat.	Agreed. Funding for this work is included in Concept #20, Rare Plant Propagation, Phase II. The Desert Conservation Program also has an ongoing SNPLMA Round 17 project that is intended to synthesize the current state of knowledge regarding restoration in desert tortoise habitat and to identify restoration research priorities.
U.S. Fish and Wildlife Service	Screwbean mesquite is an iconic tree species of riparian woodlands in the arid Southwest. As a foundational species in the ecosystems where it occurs, screwbean provides critically important wildlife habitat, supports a diversity of insect pollinators, and is culturally significant to indigenous peoples. In California, the endangered least Bells' vireo often nests in screwbean mesquite trees. This species is important habitat for the endangered southwestern willow flycatcher, and two additional species covered under the Clark County MSHCP: Arizona Bell's vireo and phainopepla. Since approximately 2005, screwbean mesquite trees have been experiencing rapid and synchronous die-offs, often in large patches. Surprisingly, this regional-scale phenomenon has gone largely unnoticed until recently and causes remain unknown. The main research needs are to 1) Identify the underlying primary and secondary causes of die-off, 2) map existing die-off and develop models for forecasting future die-off areas using remote sensing technology and regional networks of specialists and citizen scientists, and 3) identify resistant trees to use as propagule sources.	Agreed. Funding for this work is included in Concept #20, Investigate Screwbean Mesquite Die-off.
U.S. Fish and Wildlife Service	Continue to support range-wide desert tortoise monitoring within Tortoise Conservation Areas.	Agreed. Funding for this work is included in Concept #5, Range-wide Desert Tortoise Monitoring Support.
U.S. Fish and Wildlife Service	Assuming satisfactory progress in Phase I, continue Phase II of the Road Warriors project	Agreed. Funding for this work is included in Concept #10, Road Warriors.

Agency	Funding Recommendation	Desert Conservation Program Response
U.S. Fish and Wildlife Service	Potentially integrate with the County's existing vegetation-mapping project to map land disturbances (e.g., via compilation of existing data sources, remote sensing, and ground surveys, as necessary) which are relevant to desert tortoise occupancy and population connectivity.	Not included. The Desert Conservation Program is currently developing a web-based habitat and disturbance mapping tool which we expect to be available by the end of 2020. This work is being completed by in-house staff and no additional funding is needed. Additionally, mapping and classification of disturbed areas is already included in the current vegetation map project.
Nevada Division of Forestry	Existing habitat models have been developed based on a variety of biological and environmental factors that correlate with, and hopefully predict at some level, plant occurrences. Accuracy assessments to date find these models relatively accurate when field tested, with few occurrences outside of predicted habitat. Models could be refined based on more descriptive metrics identifying which specialized landforms and defined ecological systems (there are several well-defined ecological system classifications available) are the best fit, and then could be used to further refine occurrence probability across the landscape to aid in reducing the disparity between suitable and occupied habitat of the current models.	Not included. Funding to complete this work was included in the 2017-2019 Implementation Plan and Budget (refer to Concept #17, Permit Amendment, Covered Species Surveys and Refinement of Species Distribution Models). No additional funding is needed to complete this work.
Nevada Division of Forestry	Fencing installation is needed within at least two areas of high quality and densely populated habitats where Las Vegas bearpoppy occurs to protect from disturbance by off-road vehicle recreation. Habitat conservation is needed in the Rainbow Gardens/Sunrise Special Recreation Management Area (large project, well-defined by BLM regarding gaps in existing infrastructure), and also in the Bitter Springs area, which is less accessible and therefore less visible for enforcement but a highly used recreation site.	Partially agreed. Funding to conduct habitat in Rainbow Gardens/Sunrise is included in Concept #11, Rainbow Gardens Conservation. This project will include a component to further study and evaluate techniques for restoration of Las Vegas bearpoppy habitat; therefore, we have decided to advance only one of these recommendations so that we can leverage lessons learned in the future. Restoration within the Bitter Springs area is tentatively proposed for funding under Round 19 of SNPLMA.

Agency	Funding Recommendation	Desert Conservation Program Response
Nevada Division of Forestry	There is a need to identify and expand Las Vegas bearpoppy populations that may support the Mojave poppy bee, a species that U.S. Fish and Wildlife Service is currently considering for Endangered Species Act protections after a positive 90-day finding in late 2019. Surveys on BLM land are currently funded, additionally some of the most extensive datasets currently exist for BLM lands, therefore, we propose funding targeting undersurveyed areas with the goal of expanding the datasets of occupied habitat. Benefits of expanding known occurrences could support more effective habitat connectivity and conservation activities, and potentially reduce the need for future listing efforts if datasets are expanded with more and robust observations.	Agreed. Funding for this work is included in Concept #22, Surveys for Gypsum Endemics.
Nevada Division of Forestry	BLM funded research conducted in 2019-2020 as mitigation for expansion of a gypsum mine in BLM habitat has some very encouraging results – 80 percent survival rates for transplanted seedlings after one season, with 85 percent of the plants flowering in their first year. We propose to scale up similar techniques at sites in Rainbow Gardens at sites needing restoration resulting from habitat disturbance by illegal recreation use.	Agreed. Funding for this work is included in Concept #11, Rainbow Gardens Conservation.
Nevada Division of Forestry	Previous Desert Conservation Program funding resulted in the first habitat model for the critically endangered blue diamond cholla. With a relatively paucity of observations compared to many species for which models have been developed, we predict that either the habitat model covers vast swaths of land that may be unsuitable for occupancy, or the model may aid in drastically increasing the known occurrences of the species. Therefore, more targeted surveys specifically for this species are requested.	Agreed. Funding for this work is included in Concept #21, Blue Diamond Cholla Surveys.
Nevada Division of Forestry	The Niles Herbarium recently digitized records and made them available to the public. The Nevada Division of Natural Heritage database is the "go to" source for agencies and consultants when checking the risk of conflicts and evaluating impacts of projects to protected species. Therefore, the incorporation of the herbarium data of all the MSHCP covered species would be a benefit to the conservation community. This is an activity that is relatively straightforward, but it involves some accuracy assessments (there are many sloppily georeferenced records), and NNHP staff lack the internal capacity to complete this task.	Agreed. Funding for this work is included in Concept #23, Niles Herbarium Data.

Agency	Funding Recommendation	Desert Conservation Program Response
Nevada Division of Forestry	Understanding the relationship between former or potential habitat extent and loss over time is essential for effective natural resource management decisions. Access to a cumulative loss database and maps would be helpful for the decision-making processes of various partners tasked with managing to prevent further species listing or extinction.	Not included. The Desert Conservation Program is currently developing a web-based habitat and disturbance mapping tool which we expect to be available by the end of 2020. This work is being completed by in-house staff and no additional funding is needed.
Nevada Department of Wildlife	Willow Creek is a high flow spring that supports a large riparian area. The spring is home to the Spring Mountain Spring Snail and the riparian area supports a large assemblage of species of birds covered under the MSHCP, MSCHP listed rare plants are also found in the vicinity. The creek has been damaged by unregulated OHV travel, and aggressive feral horse use, both of which has damaged the area until a post-and-cable fence was constructed in 2008. The post-and-cable fence has fallen into disrepair and has become a wildlife hazard to large animals accessing the water at the creek. An elk may or may not have become entangled in the fence in 2011 and perished. Replacing the existing post-and-cable fence with a steel pipe rail fence will benefit the riparian area while allowing large animals such as elk and mule deer safe access to the creek.	Agreed. Funding for this work is included in Concept #8, Willow Creek Fencing.
Nevada Department of Wildlife	Nevada Department of Wildlife has one reptile biologist for the entire state of Nevada. Nevada Department of Wildlife has conducted a multi-road network study that is ongoing until 2022, and it is only in Clark County. Greater than 30 percent of species encountered during this study fall under MSHCP categorization. We also conduct inventory and telemetry on Gila Monsters within Clark County. Finally, we conduct large scale presence/absence surveys in the key areas of diversity in Clark County. All of this data helps inform MSHCP models. The addition of a seasonal position to assist our current staff would allow is to expand our monitoring program within Clark County.	Agreed. Funding for this work is included in Concept #13, Reptile Monitoring Support.

Agency	Funding Recommendation	Desert Conservation Program Response
Science Advisor Panel	The AMMP calls for tracking and assessing trends in riparian and desert upland habitat quality for covered species. At the time of the completion of the AMMP, the specific methods and metrics for quantifying habitat quality for riparian and desert upland reserve units were as-yet undefined. Desert Conservation Program staff and the Science Advisor Panel plan to determine those methods and metrics at a workshop in December 2020. However, if funding is not set aside until after the November workshop, it will not be available until spring of 2024 because funding would not be released until the 2023-2025 Implementation Plan and Budget in July of 2023. We propose setting aside some amount of money in this 2021-2023 Implementation Plan and Budget so that the methods to be determined in December 2020 can be used for habitat quality monitoring in spring of 2022. We propose that in the November workshop, a comprehensive riparian and desert upland monitoring program be developed to ensure useful baseline habitat trend methods as well as project-specific vegetation monitoring methods for evaluating the success of individual restoration projects.	Agreed. Funding for this work is included in Concept #4, Adaptive Management Program.
Science Advisor Panel	The AMMP describes a process for monitoring MSHCP-covered species populations and habitat trends. For a potential future amended MSHCP permit, it is expected that new species will be covered that are not currently being monitored. We propose that money is set aside to begin collecting baseline monitoring data on proposed new species now so that a stronger baseline dataset exists if and when the permit is amended. For some species this is as simple as directing current field crews to include these species in existing monitoring activities. For others, it may require new surveys or methods to detect species unlikely to be detected under current monitoring activities. This Implementation Plan and Budget project suggestion is to set aside money to start monitoring those proposed new species that are not covered under existing monitoring activities.	Agreed. Funding for this work is included in Concept #4, Adaptive Management Program.

Agency	Funding Recommendation	Desert Conservation Program Response
Science Advisor Panel	Many species use daily or seasonal microhabitats, such as shade within trees or inside burrows, to minimize temperature extremes. With current increasing climate trends in temperature, these thermal refugia will become increasingly important (Wolf et al. 1996, Carroll et al. 2015, Albright et al. 2017). Furthermore, if bird eggs exceed 40 degrees Celcius during incubation, they can become inviable. Therefore, thermal refugia will be important for maintaining the viability of riparian bird populations and potentially other MSHCP covered species. Thermal refugia using remotely-sense data of daily and seasonal temperatures could be identified. The availability of thermal refugia could be important in maintaining suitable habitat for MSHCP-covered birds and other vertebrates. As the climate changes, the reproductive success of bird species could rely on finding thermal refugia for their nests and eggs to prevent them from becoming inviable. Project objectives include monitoring daily and seasonal temperatures within riparian reserves and other lands as needed, placing remote temperature monitors along transects within riparian reserves stratified by habitat and cover type, collecting temperature data across daily and season time periods, and analyzing the data for temperature trends to use as baseline data. To determine if thermal refugia are needed because of critically high temperatures occurring in riparian reserves, remote temperature monitors should be placed in both open cover, partial cover, and complete cover. To determine if riparian birds potentially use thermal refugia as a strategy to avoid or escape critically high temperatures for nesting or foraging, remote temperature monitors can be placed in artificial nests within appropriate nesting habitat of riparian birds. Temperature monitors should be placed at least 1 meter above the ground. Temperature data should be collected at least 1 time/hour over 24 hours from about a week before the start of nesting through fledging. Height of vegetation can be used to determine vertical stratification of habitat and cover types. Detailed protocols for establishing transects for placing remote temperature monitors (I-buttons) can be developed based on stratification of habitat and cover types within riparian reserves and/or other lands.	Agreed. Funding for this work is included in Concept #17, Riparian Thermal Refugia Study.

Agency	Funding Recommendation	Desert Conservation Program Response
Science Advisor Panel	The process of developing PVA models can refine and focus management actions for MSHCP-covered species. Efforts could include compilation of existing data, literature review, and expert workshops to identify information or management gaps. Knowing the management scenarios that lead to successful management or conservation of a species is vital. The process of developing a PVA can identify data gaps and data needs for each species. One possible source of data, particularly for birds, is citizen science data. The results of this analysis could inform future data collection and restoration efforts for MSHCP-covered species.	Partially agreed. Funding for a Phase I effort is included in Concept #16, PVA - Data Gaps for Riparian Birds. Additional taxa can be addressed in a future biennium.
Science Advisor Panel	Climate change is leading to shifts in species distributions worldwide and species currently within protected areas may no longer be protected in the future. The Desert Conservation Program owns and manages desert and riparian habitat within Clark County, which are important to MSHCP-covered species. How far into the future will the MSHCP-covered species still be protected by these lands? In the next iteration of species distribution models, the Desert Conservation Program will request including climate projections. Another possible avenue to pursue this idea is to do a literature search to determine what climate models exist to inform this project. SAP expertise on climate change could also be tapped for information. Lastly, a potential source of information would be a new forthcoming paper by Hayhoe et al. to be published in June/July 2020.	Not included. Incorporation of climate change into species distribution models will be included in a project that was identified in the 2017-2019 Implementation Plan and Budget (refer to Concept #17, Permit Amendment, Covered Species Surveys and Refinement of Species Distribution Models). A literature review may be conducted using in-house staff or as a task assigned to the Science Advisor Panel at a future date. No additional funding is needed at this time.

Agency	Funding Recommendation	Desert Conservation Program Response
Science Advisor Panel	An analysis of representation and redundancy will require understanding the habitat needs of each covered bird species (preferably grouped by similar needs) and comparing those needs with existing habitat on riparian reserve properties. Vegetation mapping and recently acquired LiDAR and will make this analysis possible. Grouping of bird species by habitat types and determination of adequacy of habitat will require input from bird specialists including Science Advisor Panel expertise, with review by local experts for applicability. Part of this effort could be an assessment of resilience of individual habitats (e.g. are trees more vulnerable to climate change than shrub communities). This project concept could gain synergy with early phases of a project involving restoration planning for the Virgin River. All of these investigations would allow Desert Conservation Program to tailor broader planting plans and conservation efforts for increased resilience.	Not included. This recommendation is being incorporated into an existing project that is currently in development. No additional funding is needed at this time.

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ATTACHMENT F

Summary of Stakeholder Comments and Reponses

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Agency	Page	Comment	Desert Conservation Program Response
Nevada Division of Forestry	General	Could the IBP report have a tally of not just the total acres and general habitat type disturbed, but add a table identifying the number of acres disturbed in habitat for covered species?	Text not revised. Since we lack species distribution models for many of the currently covered species, any such table would be incomplete. Additionally, the current MSHCP uses habitat as a proxy for for species, and thus it was not intended that we report on impacts for individual species.
Science Advisor Panel	C-5	Adaptive Management Review Summary is awkward, especially when reviewing the project goals. Seems that many of those goals are quite well-served with an adaptive management approach. Starting at the second sentence, text could read: "The one exception may be weed control which currently uses best practices for efficient and effective control measures. Should those best practices change or new weeds are encountered, adaptive management will be implemented."	Text revised. This section has been revised for clarity.
Science Advisor Panel	C-16	Project goal - could be more explicit to explain the translocated tortoises are on the BCCE(?) - it says 'assess the state of translocated populations of desert tortoises to help inform future translocation efforts' -- this goal makes it sounds range-wide. Adding some spatial/temporal boundaries to the project background or project goal would be helpful; more detail in the project background.	Text revised. Added specific reference to tortoise translocation occurring on the BCCE.
Nevada Division of Forestry	C-18	P. 42/C-18: Sentence fragment – "…protect desert tortoises from crossing SR159, and reduce the likelihood that ."	Text revised. Sentence was edited to "protect desert tortoises from crossing SR159, and reduce the likelihood that wild tortoises would be illegally captured by citizens."

Agency	Page	Comment	Desert Conservation Program Response
Science Advisor Panel	C-21	Just a comment on cost -- Willow creek has project (fencing) costs of 6,300 ft for $100K, where BCCE fencing has 30,000 ft for $250K. $16/ft at Willow creek vs. $8/foot in desert. Just want to confirm budgets are correct and a short explanation would help the justification. (I realize different habitat, different fencing types, different scopes).	Text not revised. The Willow Creek fencing project will require NEPA analysis (in the form of a Determination of NEPA Adequacy) before fencing can be installed. The BCCE fencing project will not have any requirements for anaylsis under NEPA. In addition to the NEPA difference, the Willow Creek project proposes to install steel pipe fence whereas the BCCE project will install a combination of post-and-cable fencing and three-strand fencing. The materials necessary for the BCCE fencing project are generally less expensive that materials needed for the Willow Creek fencing project. A third factor in the cost difference is the ease of accessability between the two sites. Willow Creek is a remote location in more difficult terrain, whereas the BCCE is in close proximity to development, in sandy soils (i.e., easier to excavate), and on relatively flat terrain.
Science Advisor Panel	C-25	Not sure I understand how the Road Warrior project during 2019-2021 has been shown to be cost effective when it is still only 2020 currently. Re-word? In the last sentence there is mention of a pilot project that was successful during 2019 and 2020; first it is still 2020 and second this is the first mention of a pilot project; how is it related to the 2019-2021 project mentioned above? Clarification is needed.	Text Revised: The background and need clarifies the reference to the previous project as described in the 2019-2021 Implementation plan and budget not specifically taking place in 2019 - 2021 while it is still 2020. The Project is approximately 90% completed and it is accurate to say that the project has provided a cost effective approach so far. Also clarified that the "pilot project" is based on the 2019-2021 IPB "Baseline Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing" and "Road Warriors" projects combined.
Science Advisor Panel	C-25	Road Warriors Background & Need: It is being proposed to triple the budget of this project over the previous biennium. This should be accompanied by a bit more information about what is expected to be achieved with this larger budget beyond adding "... expand efforts ..." to the verbiage of the previous IPB.	Text Revised: Clarified that this is two projects combined from the 2019-2021 IPB "Baseline Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing" and "Road Warriors". Also clarified that this would at least double the number of miles of survey completed from the current project.

Agency	Page	Comment	Desert Conservation Program Response
Nevada Division of Forestry	C-28	"Project Objectives: I don't know that there is evidence that the primary risk from invasive species is fuel load facilitating wildfires. In the Rainbow Gardens environment, I would expect that competition for the severely limited resources in this extreme environment would have more of a negative impact on native plants than fire risk. Consider revised language. Additionally, consider including surface contouring as a restoration activity. Surface contouring beyond raking would reduce the visual impacts of illegal routes as well as provide micro-topography for catchments of seeds and water. Imprints or divets have proved successful for native seedling establishment in a number of projects. Similar results can can be accomplished by hand through the establishment of furrows or other small-scale soil topography. Monitoring of germination and transplantation research should be continued for as long as possible to be able to evaluate: a) Did the transplanted individuals survive b) Did they reproduce? c) Is there evidence of successful establishment of new individuals nearby transplanted individuals? Is it possible to allow 3 years of monitoring?"	Text revised. The project objectives now state that invasive species compete with natives for resources. Surface contouring and imprinting have been added as potential restoration methods. The project approach previously stated that "plants will be monitored for at least a year." This was an accidental carry-over from a previous draft. The project budget allows for 3 years of monitoring, and the text has been revised to reflect this. Additionally, since permanent study plots will be established, it is also possible that additional years of monitoring could potentially be funded in future biennium cycles or funded by other organizations to investigate long-term results.

Agency	Page	Comment	Desert Conservation Program Response
Science Advisor Panel	C-29	We fully support new and large-scale restoration projects. However, we are concerned about the large budget of this project given that it will occur outside of the reserve system and therefore on potentially non-durable lands. In general, we also recommend more detail for very large projects regarding how the money will be spent. Please document how the DCP has assurances or confidence regarding durability of the restoration actions and in general add stronger justification for very large budgets (e.g., better description of specific actions or sub-projects).	Text revised. Revised to clarify that Rainbow Gardens is a biological Area of Critical Environmental Concern (ACEC) designated as such for its sensitive plant, geological, scientific, cultural, and scenic values. It is therefore granted more protection and special management compared to other multiple use areas. Additionally, the DCP currently holds no reserve lands with suitable Las Vegas bearpoppy habitat, so this is our best chance at providing useful assistance with this species.
Science Advisor Panel	C-32	SH: Piute-Eldorado Restoration: This seems like a large budget amount if so many of the actions that will potentially be completed under this project are as yet undetermined. I suggest nailing down more details to justify such an expensive project, unless it is clarified that any unspent money will be rolled into other projects. JA: This project is a large undertaking and I hope that the effort and funds expended are worth it in the end. Is there a timeline associated with this work? How soon would expected benefits be potentially observed? Just curious because showing success early in a project will help with supporting this project in the long term. CR: Agree. Additional context justifying the budget would be helpful.	Text not revised. The SNPLMA program did not place limits on the amount of funding that could be requested for projects through Round 18; therefore the Desert Conservation Program worked with BLM to identify a project that was as large as we believed could feasibly be accomplished within the 5-year SNPLMA timeframe in order to maximize potential project benefits. Many of the specifics of the project will be determined through the development of the restoration plan, which is part of the overall project and therefore additional detail cannot be provided at this time as things may change. Any funds that remain unspent at the end of the project will be de-obligated and made available for future SNPLMA rounds.
Science Advisor Panel	C-40	Adaptive Management Review Summary. Language here is a little vague as to whether adaptive manage WILL be used before, during and after the projects. Describing methods can be cumbersome, but an initial list of variables would be helpful.	Text not revised. Unclear what is meant by "before during and after the project". Adaptive management is a process that encompasses the entire project. A list of variables is too detailed for this section. This section is simply designed to state whether or not an adaptive management approach should be used when the project planning phase begins.
Science	C-44	Adaptive Management Review.	Text revised. Text revised as suggested.

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Advisor Panel		Unclear what is meant here by 'habitat redundancies'. May be interpreted as too many of them. May be more clear to state "This project would offer additional data to the Adaptive Management Program and Riparian Reserves project manager about requirements for successful restoration efforts and would help inventory thermal refuges across the reserve units."	
Science Advisor Panel	C-46	First paragraph. Third sentence. How about 'may be influenced' rather than 'is heavily influenced'. Do we know this? How much of willow reproduction is via seed vs. vegetative? I support the project, but question the strong wording used here.	Text revised. Revised as suggested.
Nevada Division of Forestry	C-46	This is interesting, looking forward to the results from these studies.	Text not revised. Thank you for your support of this project.
Science Advisor Panel	C-48	I think Principle #6 could be included here because I believe this project idea came from the Science Advisor Panel.	Text revised. Revised as suggested. Yes, the original project recommendation was made by the Science Advisor Panel.

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Nevada Division of Forestry	C-49	Obviously since this is included, the community is aware that this issue exists. NDF is working with USFWS, TNC, and NDOW to conduct some preliminary investigations, along the same lines of what is proposed here, but a smaller scale (~$30K funded). We will be using existing vegetation data to sample random-targeted sites throughout Clark County and evaluate the condition of patches and develop sampling methods for insects and disease identification (if any are observed) along with some soil and water sampling. We will be developing a sampling protocol this fall to be implemented starting in spring, 2021. So – heads up to have consultants/researchers discuss preliminary work when developing the DCP funded project. We would also be happy to start discussions now if you have PIs/labs in mind that are likely to do this research.	Text not revised. We will ensure consultants/researchers are aware of NDF's preliminary work when developing the DCP funded project. We will coordinate to discuss PIs/labs we've reached out to that can do this research.

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Nevada Division of Forestry	C-51	Was the success rate of prior work great enough to assume that greenhouse emergence could determine the seed bank? My impression was that we were not yet successful enough in germination to assume that, therefore I would think the extraction method – while labor intensive – would be more accurate if determining the seed bank was a project task. Additionally – has there been great enough success in germination and survival to test "propagation practices"? I know there have been some labs that have had varying levels of success with germination, but nearly all were very short lived (i.e. seedlings did not live past year 1). One need that may exist but I'm not aware of it is to produce a summary of the work done to date. I know there have been quite a few trials over the last 10-15 years, are we (as a scientific community) able to keep track of what was tried where and how so that we can learn from and expand on previous efforts? Checking out the seed (seeding) viability for threecorner milkvetch will be very helpful. NDF will be working with the Gemini solar developer to develop a population viability analysis as part of their mitigation activities. Life history information related to seed production, viability, and germination success would be incredibly useful and timely for that analysis."	Text not revised. It is true that the seedling emergence method may underestimate the seed bank due to poor germination rates. However, the extraction method poses a similar problem since the seeds of Las Vegas bearpoppy are quite small (1-2 mm) and are likely to be missed during extraction. The DCP and researchers we have consulted with feel that testing of propagation practices for these species is warranted, although the research is certainly in its infancy and is likely to require many more years of study before consistently reliable results can be achieved. Thank you for your support of this project.

Agency	Page	Comment	Desert Conservation Program Response
Nevada Division of Forestry	C-56	""Utilize existing habitat prediction models and local knowledge to identify undersurveyed areas adjacent to BLM lands that have habitat suitable for Las Vegas Bearpoppy." During the effort to determine the extent of the currently occupied habitat, checking areas where the species records have been historically located outside of the currently modelled habitat could be fruitful. NDF forester Gary Reese determined from herbarium specimens on SEINet (including UNLV) that Arctomecon californica occurs in the following ecological systems: Mojave Mid-Elevation Mixed Desert Scrub, Inter-Mountain Basins Shale Badland (i.e., gypsum-bearing)and Sonora-Mojave Creosotebush-White Bursage Desert Scrub. Thus, it is not necessarily an obligate gypsophile. We could take this opportunity to include a small proportion of surveys on non-gypsiferous soils where there have been previous records or anecdotal evidence of poppy presence. I don't know that there is a need for changes to the text as is since this topic would be covered by "...and local knowledge..." Potentially including text to highlight historic records could be helpful? "	Text revised. Revised to indicate that non-gypsum soils may also be included if local knowledge and/or historical records indicate a need to do so.
Science Advisor Panel	C-58	Table 2: $60,000 to incorporate digitized data from the Niles Herbarium into the state's species database sounds like a lot of funds to accomplish what sounds like a small project. Please provide an explanation to justify the budget	Text not revised. This is based on an estimate given from the Heritage program on what it would cost for them to hire people to complete this work

Agency	Page	Comment	Desert Conservation Program Response
Science Advisor Panel	C-58	Is it correct that this project is specific only to MSHCP species? Therefore, not all 65,000 specimens nor 1,600 species will be incorporated in the NNHP database?	Text revised. No, this is not for only MSHCP covered species. It includes all track-list and watch-list species identified by the Heritage Program.
Nevada Division of Forestry	C-58	""Incorporate all MSHCP covered species records from the Niles Herbarium into the NNHP database." Note that duplicate sheets which were exchanged by UNLV with other herbaria may have already been georeferenced or have mistakes corrected from the original sheets. We already know of records from the Niles herbarium where the location (commonly T-R-S from older records) did not match the described altitude or site description. Some of these have been corrected when records have been duplicated in other herbaria. Therefore, we advise that this project explicitly request for the consultant to conduct herbarium searches (using a database such as SEInet) to cross check for duplicate specimens by searching for the same collector and collection number in SEINet and Biotics (NNHP database) and validate recorded information (especially location information). This should avoid duplication of efforts that have previously been performed."	Text not revised. Thank you for the suggestion. We will look into incorporating that into the scope of work when the project is initiated.
Nevada Division of Forestry	C-60	This product will be incredibly useful for the land management and scientific community.	Text not revised. Thank you for the support, we also believe that this will be used in a wide variety of local and regional scientific studies.

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