IMPLEMENTATION PLAN AND BUDGET

2019-2021

Final Report – December 2018

MOJAVEMAX.COM

desert conservation PROGRAM

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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 2019-2021 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 Air Quality 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.

Funding to implement the permit conditions and conservation actions in the MSHCP is 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. Additional funding is available from the sale of federal land in Clark County as authorized by the Southern Nevada Public Lands Management Act (SNPLMA) of 1998, as amended. This funding is awarded on a competitive basis and is not guaranteed.

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 to develop the 2019-2021 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.

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. At the time of this writing, the terms of this permit were still under negotiation between the Permittees and the Nevada Division of Forestry. Funding for actions specified in the Nevada Division of Forestry Master Permit is contingent upon successful negotiation and execution of the Master Permit.

Other actions that further the goals and objectives of the MSHCP but are not directly specified in the incidental take permit are considered discretionary, 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 2019-2021 Implementation Plan and Budget was an iterative process that began in March 2018. The Plan Administrator prepared draft budget principles and a draft process and schedule, which were provided to the independent Science Advisor Panel and the Permittees for review and comment on March 1, 2018; to the U.S. Fish and Wildlife Service on March 12, 2018; and to the Nevada Division of Forestry on March 14, 2018. Attachment A outlines the process and schedule agreed to by the parties and used to prepare the 2019-2021 Implementation Plan and Budget. The budget principles, available in Attachment B, guide the development and selection of project concepts for the 2019-2021 biennium.

Based on the budget principles, the Science Advisor Panel prepared an independent review of the program and provided recommendations for discretionary funding projects. The Plan Administrator then prepared project concepts and budgets taking into account the Science Advisor Panel 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 2019-2021 biennium, the budget principles developed by the Plan Administrator, and previous budgets and expenditures. Additionally,

the U.S. Fish and Wildlife Service submitted project recommendations to the Plan Administrator for consideration in the 2019-2021 Implementation Plan and Budget process.

The Plan Administrator prepared the following non-discretionary project concepts for the 2019-2021 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. Public Information, Education, and Outreach Program: includes the Mojave Max Education Program, public and stakeholder outreach, and various media campaigns and publications.
5. 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.
6. 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.
7. 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 2019-2021 Implementation Plan and Budget:

8. Riparian Restoration: restore, create, and enhance riparian habitat for MSHCP covered species within the Muddy River and Virgin River reserve units.
9. "To the Max" Campaign: continue to implement a public outreach campaign designed to spread the messages of conservation and responsible desert recreation throughout the community.
10. Education for Construction Personnel: Expand education outreach within the development community to increase awareness of the Wild Desert Tortoise Assistance Line and procedures for handling desert tortoises on private-land project sites.
11. Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing: initiate a pilot project leveraging volunteers with The Tortoise Group to monitor and conduct minor repairs to desert tortoise exclusionary fencing.
12. Road Warriors: Citizen Scientist Monitoring for Mojave Desert Road Mortality and Live Encounters to Identify Priority Areas for Fence installation: initiate a pilot project to evaluate the use of citizen scientists volunteers to conduct systematic surveys of roadways to document desert tortoise live encounters and mortalities.

13. Sunrise Mountain Environmental and Geological Barrier: 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 and geological resources.
14. Permit Amendment - Vegetation Map: prepare a fine-scale, County-wide vegetation map, in accordance with the National Vegetation Classification System.
15. 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.
16. Tule Springs Fossil Beds National Monument Boundary Fence, Phase III: complete Phase III of this fencing project, consisting of construction of desert tortoise exclusionary fencing along Corn Creek Road and associated tortoise guards and gates.
17. SR159 Fencing, Phase I and II: construct approximately 10.5 miles of desert tortoise exclusionary fencing along State Route 159.
18. Demography/Population Viability of Tortoises in Translocation Sites: provides funding to continue long-term monitoring of a cohort of translocated desert tortoises to better understand the long-term effects of population augmentation on resident and translocated tortoises.
19. Desert Tortoise Predator-Prey Dynamics, Phase II: 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.
20. Protected Plant Species Propagation Research: investigate propagation techniques and the feasibility of establishing nursery populations for four state-listed plant species.
21. Inventory and Ecology of Plant-Pollinator Systems within Riparian Areas: investigate the current ecology of plant-pollinator systems within riparian areas of Clark County so the resulting information can be used to better restore and manage riparian properties.
22. Brome Reduction and Native Plant Establishment at Trout Canyon and Stump Springs: fund research to identify which herbicides and which application techniques result in the greatest brome reduction.
23. Understanding Threats to the Persistence of Nevada Gila Monsters: combine data regarding the habitat requirements, geographic distribution, and genetic diversity of Nevada Gila monsters into a spatially-explicit model to determine specific threats to species persistence and the identification of current and future critical management needs.

The complete project concepts are available in Attachment C.

SNPLMA PROJECT NOMINATION DEVELOPMENT

The Round 17 funding call for nominations was published on March 7, 2017 and nominations were accepted through May 5, 2017. The Desert Conservation Program submitted three nominations under the MSHCP category totaling $1,192,071.00. The SNPLMA Executive Committee met on December 5 and 6, 2017 to compile final funding recommendations for Round 17. The Executive Committee made the decision to recommend all three of the Desert Conservation Program's nominations for funding. The projects nominated for funding under Round 17 include:

- Covered Species Surveys and Refinement of Species Distribution Models, funding request: $400,000.00

- Desert Tortoise Monitoring on Translocation Sites, funding request: $442,071.00
- Evaluating Desert Tortoise Habitat Restoration Methods in the Mojave Desert, funding request: $350,000.00

These projects will be implemented as conservation actions under the 2017-2019 Implementation Plan and Budget. The final Secretary of Interior approval for Round 17 was expected to occur in the summer of 2018, but has been delayed at the time of this writing.

The Bureau of Land Management has not announced Round 18 call for nominations, but is anticipated to do so in the first quarter of 2019. The Desert Conservation Program will be permitted to submit up to three nominations for funding under Round 18. The 2019-2021 Implementation Plan and Budget projects identified for funding under Round 18 include:

- Range-wide Desert Tortoise Monitoring Support, funding request: $1,340,000.00 (partial SNPLMA)
- Sunrise Mountain Environmental and Geological Barrier, funding request: $500,000.00
- SR159 Fencing, Phase I and II, funding request: 718,325.00

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

A draft of the Process and Schedule and Budget Principles was provided to the independent Science Advisor Panel and the Permittees for review and comment on March 1, 2018; to the U.S. Fish and Wildlife Service on March 12, 2018; and to the Nevada Division of Forestry on March 14, 2018. 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 30, 2018. 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 2019-2021 Implementation

Plan and Budget. Funding recommendations were also provided by U.S. Fish and Wildlife Service on June 4, 2018. A summary of all funding recommendations and response to recommendations is included in Attachment E.

A preliminary list of proposed projects including proposed budgets was provided to the Permittees during a meeting held on July 12, 2018. No comments were received from the Permittees.

A copy of the draft 2019-2021 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, and the Science Advisor Panel on August 21, 2018. All comments were received by September 28, 2018. A summary of comments and response to comments is provided in Attachment F.

PUBLIC COMMENT PERIOD AND RESPONSE TO COMMENTS

The Draft 2019-2021 Implementation Plan and Budget report was posted on Clark County's website (http://www.clarkcountynv.gov/airquality/dcp/Pages/default.aspx) on October 19, 2016. A notice of this posting was also sent to the DCP's Interested Parties list, which is an email distribution list of over 400 stakeholders and citizens. The public comment period closed at 5:00 p.m. PST on November 28th, 2018. No public comments were received during the comment period.

PROPOSED 2019-2021 IMPLEMENTATION PLAN AND BUDGET

Upon consideration of all the discussions and comments to date, the Plan Administrator has proposed a 2019-2021 biennial budget of $13,555,335.54, which represents an approximate increase of $2.1 million over the previous biennium. Refer to Table 1 for a comparison of biennial spending versus disturbance for recent Implementation Plans and Budgets. Included in Attachment G is a fund balance projection. This projection summarizes the anticipated revenues and fund balance drawdown for the remainder of the permit term and is provided to demonstrate that the Desert Conservation Program will maintain financial solvency through the end of the permit term (February of 2031).

Table 1.
Biennial Disturbance and Proposed Budgets

BIENNIUM PLANNING PERIOD	DISTURBANCE (ACRES)*	PROPOSED BIENNIUM BUDGET	
		SECTION 10 FUNDS	SNPLMA FUNDS
2011-2013	1,804	$10,125,502	$92,000
2013-2015	1,557	$7,931,791	$473,150
2015-2017	2,153	$6,914,884	$6,509,523
2017-2019	7,381	$10,230,174	$1,192,071**
2019-2021	5,849	$10,997,006	$2,558,325**

*Disturbance for each planning period is determined through geospatial analysis of aerial imagery. Imagery is collected in the spring of each year.

**Budget amounts are proposed, final decision to award is made by the Secretary of Interior.

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 was submitted to the Clark County Board of County Commissioners for approval on December 18, 2018.

Table 2.
Proposed 2019-2021 Implementation Plan and Budget

CONCEPT NUMBER	PROJECT TITLE	FUNDING SOURCE	
		SECTION 10 FUNDS	ROUND 18 SNPLMA FUNDS
ADMINISTRATION*			
1	General Administration	$1,830,281.00	
1	Staff Salaries and Benefits to Implement Conservation Projects**	$3,202,262.00	
	Subtotal (Administration)	$5,032,543.00	
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	Public Information, Education, and Outreach Program	$375,170.00	
5	Adaptive Management Program	$1,070,000.00	

CONCEPT NUMBER	PROJECT TITLE	FUNDING SOURCE	
		SECTION 10 FUNDS	ROUND 18 SNPLMA FUNDS
6	Range-wide Desert Tortoise Monitoring Support	$252,631.08	$1,340,000.00
7	Translocation Support	$298,200.46	
	Subtotal (Non-discretionary Conservation Projects)	$2,776,921.54	$1,340,000.00
DISCRETIONARY CONSERVATION PROJECTS			
8	Riparian Restoration	$336,000.00	
9	"To the Max" Campaign	$433,755.00	
10	Education for Construction Personnel	$62,500.00	
11	Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing	$10,000.00	
12	Road Warriors: Citizen Scientist Monitoring for Mojave Desert Road Mortality and Live Encounters to Identify Priority Areas for Fence Installation	$20,300.00	
13	Sunrise Mountain Environmental and Geological Protection Barrier	$0.00	$500,000.00
14	Permit Amendment - Vegetation Map	$400,000.00	
15	Permit Amendment Support	$313,575.00	
16	Tule Springs Fossil Beds National Monument Boundary Fence, Phase III	$306,020.00	
17	SR159 Fencing, Phase I and II	$0.00	$718,325.00
18	Demography/Population Viability of Tortoises in Translocation Sites	$250,000.00	
19	Desert Tortoise Predator-Prey Dynamics, Phase II	$491,153.00	
20	Protected Plant Species Propagation Research	$137,943.00	
21	Inventory and Ecology of Plant-Pollinator Systems within Riparian Areas	$50,000.00	
22	Brome Reduction and Native Plant Establishment at Trout Canyon and Stump Springs	$22,300.00	
23	Understanding Threats to the Persistence of Nevada Gila Monsters	$354,000.00	
	Subtotal (Discretionary Conservation Projects)	$3,187,551	$1,218,325.00

CONCEPT NUMBER	PROJECT TITLE	FUNDING SOURCE	
		SECTION 10 FUNDS	ROUND 18 SNPLMA FUNDS
BUDGET SUMMARY			
	Section 10 Funds		$10,997,010.54
	SNPLMA Funds		$2,558,325.00
	TOTAL		**$13,555,335.54**

* 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 2019-2021 biennium as well as 39 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 (U.S. Fish and Wildlife Service) in writing.

- March/April 2018: Clark County, in consultation with the Permittees, Science Advisor, Nevada Division of Forestry (NDF), and U.S. Fish and Wildlife Service, develops draft Implementation Plan and Budget Process and Schedule and draft Budget Principles to guide development of budget and conservation measures.
    - Early March 2018: Desert Conservation Program (Desert Conservation Program) Senior Team develops the proposed Process and Schedule and the proposed Budget Principles.
    - Mid-March 2018: Draft Implementation Plan and Budget Process and Schedule and draft Budget Principles are provided to the Permittees, Science Advisor, NDF, and U.S. Fish and Wildlife Service for review and comment.
    - Late March 2018: Desert Conservation Program Plan Administrator briefs Clark County management on upcoming Implementation Plan and Budget process and reviews draft Process and Schedule and draft Budget Principles.
- April/May 2018: Clark County, on behalf of the Permittees, establishes final Implementation Plan and Budget Process and Schedule and final Budget Principles and prepares initial budget and conservation measure concepts for non-discretionary projects and discretionary projects, as warranted.
    - Mid-April 2018: Desert Conservation Program requests that Permittees, 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 3rd, 2018: 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 2018: 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.
    - Mid-May 2018: 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 30th, 2018: Science Advisor submits their Implementation Plan and Budget Funding Recommendations report.
- June/July 2018 – 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 2018: 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.

  - June 2018: Desert Conservation Program staff provides General Information Report and/or briefings to County Commission on Implementation Plan and Budget Process and Schedule and Budget Principles.
  - Early July 2018: Desert Conservation Program staff prepares draft project concepts and budgets; submits to Desert Conservation Program Senior Team for review and editing.
  - July 12th, 2018: Plan Administrator reviews draft project concepts and budgets with the Executive Committee.
  - Mid-July 2018: Desert Conservation Program Senior Team staff compiles the draft Implementation Plan and Budget report; draft Implementation Plan and Budget report is provided to the Permittees, Science Advisor, NDF, and U.S. Fish and Wildlife Service for review and comment.
- August/September 2018: 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 2018: Permittee, Science Advisor, NDF, and U.S. Fish and Wildlife Service comments on the draft Implementation Plan and Budget report are due.
  - Mid-September 2018: 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 2018: Desert Conservation Program responds to public comment, finalizes budget and report, and schedules item for Board of County Commission approval.
  - Early October 2018: Public comment period closes; Desert Conservation Program staff review public comments and prepare the final Implementation Plan and Budget report.
  - Early October 2018: Desert Conservation Program staff prepares draft Agenda Item; Deputy District Attorney reviews draft Agenda Item.
  - Late October/Early December 2018: Board of County Commissioners adopts final Implementation Plan and Budget report.
- December 2018 through June 2019: 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 2019: Desert Conservation Program staff prepares and submits proposals for funding under Round 18 of the Southern Nevada Public Lands Management Act (SNPLMA). This timeframe is tentative, as Round 18 submittal dates have not yet been established by the Bureau of Land Management. Funding awarded under SNPLMA is typically made available approximately 12-14 months following the call for funding nominations.
- July 1, 2019: 2019-2021 Implementation Plan and Budget goes into effect.

Underlined dates are set and are not flexible

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 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 2015 through Spring 2017, approximately 5,849 acres of habitat were disturbed on private land. The majority of habitat disturbance was comprised of Mojave desert scrub (5,386 acres), and the remaining disturbance was comprised of 65 acres of mesquite/acacia, 280 acres of salt desert scrub, 50 acres of desert riparian, and 47 acres of playa.

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 recommendations.

7. Focuses on projects with measurable outcomes that are pertinent to the Multiple Species Habitat Conservation Plan (MSHCP).

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

9. Addresses program goals. Program goals that have been identified for the 2019-2021 biennium include:

   - Augmentation of desert tortoise populations
   - Restoration of desert tortoise habitat
   - Restoration of desert riparian habitat
   - Mitigation of impacts to mesquite/acacia habitat
   - Acquire updated mapping data for ecosystems
   - 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 2019-2021 biennium, these expenses amount to $678,700.

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 2019-2021 biennium these necessary expenses amount to $84,160.

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 No. 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 18 full-time equivalents (FTEs), with 11 FTEs currently filled and 6 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 2019-2021 Implementation Plan and Budget with the 11 FTEs currently filled. This would leave 6 FTEs vacant and continue the program's vacancy savings of $1,243,021 for the 2019-2021 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 Southern Nevada Public Lands Management Act 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:

- Boulder City Conservation Easement 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 2019-2021 biennium, the total required salaries and benefits budget is $4,269,683. It is important to note that only a portion, 25 percent or $1,067,421, of this budget is allocated for general administrative activities and that 75 percent of this budget, or $3,202,262, consists of the staff salaries and benefits dedicated to the direct implementation by staff of 75 existing or proposed conservation projects.

ADMINISTRATIVE BUDGET AMOUNTS IN CONTEXT

The total recommended Implementation Plan and Budget for 2019-2021 is $13,555,335.54. County internal service charges, Desert Conservation Program operating expenses, and salaries and benefits for general administration of the program amounts to $1,830,281, or 13.5 percent of the total proposed budget. It should be noted that 53 "master project" budgets totaling $18,601,741 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 $1,830,281is 5.7 percent of the total funds being administered during the 2019-2021 Implementation Plan and Budget.

The remaining $11,721,049.54 or 86.5 percent of the 2019-2021 budget is comprised of the direct project costs of the proposed conservation projects ($8,522,787.54) and the Desert Conservation Program staff salaries and benefits to implement the existing and proposed conservation projects ($3,202,262).

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	$678,700
Operational Expenses	$84,160
Salaries and Benefits for General Administration	$1,067,421
Salaries and Benefits for Implementation of Conservation Projects	$3,202,262
Total Administration Budget	$5,032,543

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle 1. 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. The one exception may be weed control which theoretically could be handled in a few different ways; however, as long as the weeds are controlled in an efficient and cost effective manner the decision on what control measures to implement is probably best left to the professionals implementing the contract.

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 Conservation Easement Agreement, as amended in 2010, 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 in 2010.
- 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 Exhibit D of the *BCCE Agreement*.
- Review and update the *BCCE Management Plan* to reflect current conditions and direction.

- 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 patrols.
- Meet on-site at least monthly with the law enforcement patrol officer 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 if 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 activity 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 in 2010, 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 5,386 acres of this type of habitat was disturbed from 2015 to 2017.

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 - This project addresses 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, and 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.

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.

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 2015 through spring 2017, 50 acres of desert riparian and 65 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.

PUBLIC INFORMATION, EDUCATION, AND OUTREACH PROGRAM

BACKGROUND AND NEED FOR PROJECT:

In accordance with the Clark County MSHCP, the Clark County Desert Conservation Program is tasked with administering a public information and education program. The public information and education program is one of many measures implemented by the County to minimize and mitigate the impacts of take resulting from private land development activities within Clark County. The purpose of the public information and education program is to spread the message of conservation and responsible desert use throughout the community.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project has been a staple of the Desert Conservation Program for many years and does a good job of educating the public. It would be advantageous to work out a reliable method for monitoring effectiveness of the public information, education, and outreach program over time. That being said it is still a very important program area even without an adaptive management component.

PROJECT GOAL(S):

This project will provide for education and information efforts to encourage respect, protection, and enjoyment of natural ecosystems in Clark County. The purpose of this project is to increase public understanding and awareness of the Desert Conservation Program and its mission and to promote environmental awareness and responsible recreation within the community.

PROJECT OBJECTIVE(S):

Efforts during the 2019 -2021 biennium will include:

- Mojave Max Education Program. Provide funding for the Mojave Max Education Program to include administration of the contract with Get Outdoors Nevada who will provide the educational components and support of the emergence contest and winner's field trip. Get Outdoors Nevada is also responsible for administering Mojave Max mascot appearances, educational table tops, and other community outreach events as well as the assemblies at various Clark County schools. Support for the emergence contest and education program will also be accomplished through printed materials, products, website administration, and advertising.
- Advertising Fees. Develop and produce advertisements via radio, print, or television regarding responsible desert use and messages regarding "Stay on the Trail" and "Explore to the Max" as well as advertisements for the Mojave Max emergence contest.
- Promotional Materials and Giveaways. Provide funding to purchase promotional items and giveaways. Giveaways are used at the Mojave Max assemblies to students who answer quiz questions correctly and also at community outreach events.
- Production of Brochures and Other Informational Materials. Develop, produce, and distribute printed materials such as Mojave Max Emergence Contest Brochures, Mojave Max bookmarks, Mojave Max coloring books, Desert Conservation Program printed materials and Boulder City Conservation Easement brochures.

- Other Miscellaneous Costs Associated with Outreach. Provide additional public information and education support as needed for other program areas such as administration, desert tortoise monitoring, and reserve area management.

PROJECT APPROACH:

Historically, Clark County has contracted with various agencies and companies to help complete projects that fall within the Public Information, Education, and Outreach Program, as well as conducted some of the work with County staff. It is the County's intent to continue this process to successfully develop and implement this program. Educational efforts target specific interest groups, children, and the general public.

PROJECT COST

$375,165.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

Principle #1 - Fulfills explicit permit conditions outlined in the current permit. This project fulfills permit conditions H and Section 2.8.3.4 of the MSHCP, which requires the Desert Conservation Program (Desert Conservation Program) to focus on appropriate methods to implement public outreach.

Principle #2 - Focuses on mitigation and minimization actions that have a rational nexus to the level and impact of take that is currently occurring and those species impacted. Activities such as construction and recreation are occurring. Providing program information and responsible use messages continues to be an important mitigation measure.

Principle #3 - Provides for continued funding of ongoing and effective conservation measures. This project provides for ongoing public information and education to inform the public of the terms of the Section 10(a) Permits; encourage respect, protection and enjoyment of natural ecosystems in Clark County.

Principle #5 - This project addresses objective R3.2 and D3.2 of the Biological Goals and Objectives by helping to promote responsible recreation through education.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project measures number of students and teachers educated each year as well as number of people reached through outreach activities.

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 baseline 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 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 the 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.

- Conduct 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
- Conduct surveys for covered riparian bird species on all or a subset of the riparian reserve units.
- Perform desert ecosystems baseline inventory and monitoring

PROJECT APPROACH:

Staff and contractors will be used to perform the above functions using the best available scientific and commercial data. During this biennium a Request for Proposals (RFP) will be produced to contract with a Science Advisor Panel that will 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.

For the Riparian Reserve Unit surveys, Contractors will use the pre-defined protocol developed by Desert Conservation Program staff in conjunction with the Science Advisor Panel, and may consist of grid inventory, point-count surveys, strip transects, or other survey protocols as deemed appropriate for meeting the goals of the project. The surveys will also include vegetation assessments and will use existing imagery to characterize habitat.

PROJECT COST

$1,070,000.00

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 (5,386 acres), and the remaining disturbance was comprised of 65 acres of mesquite/acacia, 280 acres of salt desert scrub, 50 acres of desert riparian, and 47 acres of playa.

Principle #4. This project will provide continued funding for a Science Advisor Panel under a new contract.

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 habitats, and expanding the species and habitat monitoring under the Adaptive Management 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 12-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. This concept constitutes funding to finish an ongoing project that was previously approved by the Board of County Commissioners but requires additional funding to complete the project as enacted, as well as, funding to begin a new phase of surveys after the current phase is completed in 2020. The new phase would be part of a new Southern Nevada Public Lands Management Act project (SNPLMA) proposal during the next round of proposals.

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 need to come from them and are subject to what is currently required 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 five years.

PROJECT OBJECTIVE(S):

The objectives of this project are:

- Provide three population estimates for the six Tortoise Conservation Areas over a 5-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 tortoise across the 6 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

$1,592,631.08 ($1,340,000.00 of which will be part of a new SNPLMA proposal)

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT:

Budget Principle # 5. This project will support the Biological Objectives 2.1 monitor and adaptively manage for desert tortoise populations, and D 3.1 collaborate with other stakeholders on project/mitigation work.

Budget Principle # 7. This project has a measurable outcome 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.

PROJECT GOAL(S):

The goal of this project is to continue to assess the state of the translocated populations of desert tortoises 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 over an extended period of time to allow for a better understanding of how effective translocation is over a longer term.
- Identify new sites that are suitable for future translocations, as warranted.

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

$298,200.46

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle # 3. This project would implement minimization/mitigation actions by helping us to further understand the effects of translocation on both translocated and resident populations.

Principle # 5. 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. 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.

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 fuel 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. Activities carried out under this project may be conducted on existing properties or properties that may be acquired through the conclusion of the biennium on June 30, 2021.

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 that 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 objectives of this project are:

- Create, restore, and enhance riparian habitat within the Riparian Reserve Units to increase suitable nesting habitat for the southwestern willow flycatcher, yellow-billed cuckoo, and other covered riparian birds.
- 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: plant collection/propagation/acquisition, nursery development, nonnative species removal, site clearing, and planting area preparation,
- Restoration implementation: outplanting of material, seeding, and 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

$336,000.00

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 2015 through Spring 2017, 50 acres of desert riparian and 65 acres of mesquite/acacia have been 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 habitat.

"TO THE MAX" CAMPAIGN

BACKGROUND AND NEED FOR PROJECT:

The Mojave Max Education Program has been a successful conservation action for more than 17 years. This program targets elementary-school aged children to spread the message of respect, protection, and enjoyment of the Mojave Desert. Through a project approved in the 2015-2017 Implementation Plan and Budget, the Desert Conservation Program has developed a new marketing campaign strategy that leverages the brand recognition of Mojave Max to promote responsible desert use and recreation to a wide range of age groups and demographics in Clark County. Through a multi-pronged marketing approach, the implementation of this strategy has the potential to increase awareness of the value of the County's open desert landscapes and promote responsible recreation that reduces impacts on the fragile desert ecosystem. Other potential benefits of this project include increasing awareness of the Desert Conservation Program and the service that we provide to the development community, promoting the Wild Desert Tortoise Assistance Line and the reporting of desert tortoises located on construction sites, and increasing awareness of the value of a regional mitigation program. This project concept would carry forward the marketing strategy developed under a previous project concept and would include implementing the campaign via placement of advertising through traditional and non-traditional mediums, increased social media presence and outreach, development of a website targeted at different user groups, and development of programs that will engage the community and promote responsible use and conservation.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

As with other education-based projects within the Desert Conservation Program this project would benefit from effectiveness monitoring. This campaign is still relatively new so it would be good to see how this campaign is affecting the prevalence of negative human behaviors that can impact covered species.

PROJECT GOAL(S):

The project goals are to:

- Educate and inform the Clark County community of the value of our desert landscapes and promote conservation and responsible use of the desert.
- Continue to develop a strong, distinct image and message that is widely recognizable throughout the community.
- Identify strategies for making the Desert Conservation Program's existence and purpose more well-known throughout the community, and particularly the development community. Better communicate the services and program benefits that the Desert Conservation Program provides to the development community. The goal is to foster greater communication, compliance, and mutual cooperation.
- Increase awareness of Mojave Max and the connection to the Desert Conservation Program.

PROJECT OBJECTIVE(S):

- Continue to implement a media outreach and awareness campaign via print, radio, and television advertisements and through other non-traditional mediums and grassroots efforts.
- Continue to expand social media presence and engagement with the community through social media.
- Continue to maintain the "To the Max" website to communicate the vision of the Desert Conservation Program to its respective segmented audiences.
- Update and/or create new educational and informational materials.
- Spread the message of conservation through development of innovative programs that engage the community.

PROJECT APPROACH:

The Desert Conservation Program will continue to work with the consultant who developed the unique image and theme for the "To the Max" campaign. The consultant will be responsible for developing and implementing a cohesive media campaign which will deliver specific messages to the community, coordinating media buys for advertisement placement and development of a website and informational materials, and identifying opportunities for grassroots promotion of the program's values.

PROJECT COST

$433,755.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle #1 – Fulfills explicit permit conditions outlined in the Section 10 incidental take permit. Because the Desert Conservation program is responsible for administering a public information and education program, this project would fulfill explicit conditions outlined in the Section 10 Incidental Take Permit The purpose of the public information and education program is to spread the message of conservation and responsible desert use throughout the community.

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 D3.2 and R3.2 by promoting responsible recreation through education.

EDUCATION FOR CONSTRUCTION PERSONNEL

BACKGROUND AND NEED FOR PROJECT:

Educating construction workers is an important component of maintaining compliance with the County's incidental take permit and the MSHCP Biological Goals and Objectives. Currently, to meet this requirement the Desert Conservation Program shows an approximately 5-minute video to construction personnel who attend a 'dust class' at the Department of Air Quality, which is a requirement to receiving a mandatory dust certification card. This project would expand on that requirement to include awareness education via brochures (in English and Spanish) available at points of contact with construction personnel, and by various other outreach methods to key construction personnel with a list of best management practices.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

Education projects such as this are notoriously hard to judge for effectiveness. However, a lot could be gained from figuring out a good structure for effectiveness monitoring which could aid in determining if projects like these are beneficial at their current cost or what changes could be made to make them more effective. Otherwise, the project is a very straight forward education program aimed at increasing the awareness of construction workers and decreasing tortoise mortality on construction sites.

PROJECT GOAL(S):

The goals of this project are to:

- Expand awareness training specifically targeted at construction workers and the development community.
- Increase awareness of the Wild Desert Tortoise Assistance Line amongst the development community.

PROJECT OBJECTIVE(S):

The project objectives are:

- Develop an outreach strategy that aims to increase awareness of the Wild Desert Tortoise Assistance Line and procedures for handling desert tortoises on construction sites.
- Develop brochures, videos, and other collateral material (in English and Spanish) to distribute in appropriate venues.

PROJECT APPROACH:

The Desert Conservation Program will work with consultants to develop an outreach strategy and to prepare educational brochures and other collateral outreach materials in both English and Spanish, as well as develop and implement a cohesive media campaign which will deliver specific messages to the construction and development community.

PROJECT COST

$62,500.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

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 objective D3.4, to educate construction personnel about procedures for reporting desert tortoises on project sites.

Principle #7 – Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project will measure number of construction personnel reached through outreach activities.

SUPPORT FOR VOLUNTEER MAINTENANCE OF EXISTING TORTOISE EXCLUSION FENCING

BACKGROUND AND NEED FOR PROJECT:

There are approximately 400 of miles of desert tortoise exclusionary fencing in along Nevada Department of Transportation (NDOT) highways in southern Nevada. Desert tortoise fencing requires regular monitoring and maintenance to ensure that fences remain intact, particularly following rainfall events which can result in erosion, creating breaks in fences that allow wildlife to move onto roadways in harm's way. BLM and NDOT do not have the staff to monitor the fencing and roadways in a timely fashion. This project would provide funding to support a pilot project leveraging volunteers with The Tortoise Group to conduct regular monitoring and maintenance of fencing along NDOT rights-of-way in southern Nevada.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

The objective for this project is clear and the methods are sound. This project would benefit from a structured decision making approach but should not require adaptive management.

PROJECT GOAL(S):

The goal of this project is to maintain fencing along NDOT rights-of-way in good condition.

PROJECT OBJECTIVE(S):

The objective of this project are to:

- Conduct regular surveys to monitor fence condition.
- Make minor repairs (those repairs that can be accomplished with minimal equipment and hand tools), as appropriate.
- Record and report locations where major repairs to fencing are needed.

PROJECT APPROACH:

The Desert Conservation Program will provide basic equipment and materials for a group of volunteers (coordinated by The Tortoise Group) to survey existing tortoise exclusion fencing, conduct minor repairs, and document locations where major repairs are necessary. Major repair locations will be reported to NDOT for follow up.

PROJECT COST

$10,000.00

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.

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. This project provides funding to continue maintaining those fences in good condition.

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 advance Biological Goal and Objective D3.1, collaboration with other stakeholders.

ROAD WARRIORS: CITIZEN SCIENTIST MONITORING OF ROADWAY/FENCING FOR DESERT TORTOISE MORTALITY

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 recently developed a GIS-based mapping model 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 small 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. These data revealed surprising numbers of tortoise observations along roads that were previously considered lower priority for fencing, thus highlighting the need for 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 could provide a cost-efficient approach to collecting the necessary data while engaging the general public in a meaningful conservation effort.

This project would provide funding for a pilot project to evaluate the potential use of citizen scientist volunteers to conduct systematic surveys under the guidance of qualified biologists.

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 six goals for this project:

- Evaluate the use of citizen scientists for conducting systematic surveys for desert tortoise road mortality, live tortoise observations, and tortoise sign under the guidance of biologists.
- Engage the local 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 evaluating the usefulness of the GIS-based model to identify and prioritize roads for installation of tortoise fencing.
- Provide assistance to Nevada Department of Wildlife (NDOW) 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.
- Evaluate benefits of tortoise fencing to other species.

PROJECT OBJECTIVE(S):

There are 4 objectives for this project.

- 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 NDOW 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 NDOW 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 NDOW.

PROJECT COST

$20,300.00

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. This project would provide funding to prioritize locations for new fence installation.

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.

SUNRISE MOUNTAIN ENVIRONMENTAL AND GEOLOGICAL PROTECTION BARRIER

BACKGROUND AND NEED FOR PROJECT:

The Sunrise Mountain Special Recreation Management Area (SRMA) consists of approximately 37,000 acres of BLM-administered land on the eastern perimeter of the Las Vegas valley. This area is currently managed by BLM primarily for non-motorized recreation and the protection of sensitive species, including MSHCP covered species (desert tortoise and Las Vegas bearpoppy). This area also contains a unique geological formation referred to as the "Great Unconformity". This is a rare formation with prominent exposures that can only be found in the Grand Canyon and in Frenchman Mountain, located within the Sunrise Mountain SRMA.

The Sunrise Mountain SRMA has been heavily impacted through unauthorized recreation activities including off-highway vehicle recreation, target shooting, and desert dumping. BLM currently lacks adequate staff and resources to properly manage for unauthorized activities in this area. As a result, the area has become littered with trash, off-road vehicle tracks that kill sensitive species, and graffiti that defaces the rare formation. A post-and-cable barrier along Lake Mead Boulevard would greatly reduce unauthorized, impactful recreational activities and facilitate BLM's efforts to clean up this area and conduct restoration activities. This project would provide funding to construct post-and-cable fencing in high-priority areas within the Sunrise Mountain SRMA.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This is a straightforward fencing project for the protection of biological and cultural resources and would not require an adaptive management approach.

PROJECT GOAL(S):

The goal of this project is to protect and preserve the environmental resources in the Sunrise Mountain SRMA and the geological formation known as the "Great Unconformity" for current and future generations.

PROJECT OBJECTIVE(S):

- Construct cable barrier in three sections to protect biological and cultural resources:
    - Section 1 – Construct 1.0 mile of cable barrier on the south side of Lake Mead Boulevard between the residential development area on the west to a point one mile east. This will restrict access from the west of the protected area.
    - Section 2 – Construct 1.2 miles of cable barrier on the south side of Lake Mead Boulevard from the east end of Section 1 for 1.2 miles. This will restrict access to the majority of the protected environment.
    - Section 3 - Construct 0.9 mile of cable barrier on the north side of Lake Mead Boulevard from residential development on the west to a point 0.9 miles east. This will restrict access to the majority of the protected environment to the north.

PROJECT APPROACH:

The Desert Conservation Program will work with BLM staff to complete necessary environmental reviews (biological surveys, cultural resource surveys, NEPA documentation, etc.) prior to fence construction. Fence construction will consist of the following phases:

- Phase 1 – survey and determine the exact location for the cable barrier.
- Phase 2 – Select appropriate cable barrier for this environmental and cultural site.
- Phase 3 – Construct the cable barrier as per surveyed locations and appropriate type of barrier.

PROJECT COST:

$500,000.00

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. The protection of this environmentally important area helps minimize the loss of habitat for desert tortoise and Las Vegas bearpoppy.

PERMIT AMENDMENT – VEGETATION MAP

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 spatial vegetation dataset provides the baseline for inventory, monitoring, and research activities conducted in support of the program. Currently, the County Ecosystem Map is used for these purposes. The original County Ecosystem Map was based on 1996 USGS-GAP land cover data for Nevada (Clark County 2000) and was modified to include mesquite/acacia polygons developed by the Bureau of Land Management in 1997. It was updated in 2011, incorporating the SWReGAP dataset to further refine the 11 previously defined ecosystems (Heaton, et al. 2011). Since the last update to the dataset in 2011, changes to vegetation have occurred and methods for developing spatial vegetation datasets have improved. Accurate and up-to-date vegetation maps are essential to land use planning and resource management.

This project will provide funding to prepare a comprehensive, finer-scale County-wide vegetation map. 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).

LITERATURE CITED

Clark County. 2000. Clark County multiple species habitat conservation plan and environmental impact statement for issuance of a permit to allow incidental take of 79 species in Clark County, Nevada.

Heaton, J. S., X. Miao, K. Von Seckendorff Hoff, D. Charlet, A. Grimmer, R. Patil. 2011. Final vegetation GIS data delivery: final report. Report to Clark County MSHCP 2005-UNR-578:D21.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project would be useful to the entire program as far as determining the focus of mitigation and in developing models or refining existing models. 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. This would also be useful in improving accuracy of the adaptive management review analysis with regard to habitat loss and conversion by ecosystem type. That analysis is one component in the determination of how money will be allocated in future Implementation Plans and Budgets.

PROJECT GOAL(S):

Produce an updated, finer-scale spatial vegetation dataset that covers the extent of Clark County.

PROJECT OBJECTIVE(S):

- 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:

A contractor will be selected through the request for proposals process to create the spatial dataset and conduct vegetation sampling. Planning will begin by collecting all available datasets and existing aerial imagery, which will then be used to create a preliminary vegetation map. Using the preliminary vegetation map, a vegetation sampling design will be developed to adequately sample, describe, and map vegetation communities. 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 may be completed in phases, depending on total project costs. High priority areas, consisting of future impact areas and proposed reserve units will be assigned a higher priority, with lower priority areas consisting of high-elevation habitats.

PROJECT COST

$400,000.00

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 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 #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.

Principle #9 – Addresses program goals. This project would directly address the 2019-2021 program goal to acquire updated mapping data for ecosystems.

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 National Environmental Policy Act (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

$313,575.00

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.

TULE SPRINGS FOSSIL BED NATIONAL MONUMENT FENCING, PHASE III

BACKGROUND AND NEED FOR PROJECT:

In December, 2014 Congress passed the Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for Fiscal Year 2015 bill, which designated the Tule Springs Fossil Beds National Monument. This Act resulted in the removal of 22,650 acres of land from the Las Vegas Valley Disposal Boundary and placed that land into conservation status. This Act also stipulated that the Desert Conservation Program (Desert Conservation Program) should receive, on an acre-for-acre basis, credit for the 22,650 acres of land conserved for the monument towards the development of additional non-federal land within the County through an amendment to the County's Section 10 incidental take permit.

The Desert Conservation Program desires to provide financial and project management assistance to the National Park Service for the construction of a boundary fence. Initial funding for the construction of a boundary fence was approved in the 2017-2019 Implementation Plan and Budget — this funding will cover the cost of constructing a combination post-and-cable barrier collocated with desert tortoise exclusionary fencing along the monument boundary where it borders Highway 95 (Phase I and II). Funding identified in this project concept would allow for the construction of Phase III of this project, consisting of desert tortoise exclusionary fence along Corn Creek Road within the monument.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

The science to support fencing as an adequate means of desert tortoise protection is well established, so no adaptive management is needed in that regard; however, the design of attaching tortoise exclusionary fencing to a post-and-cable barrier has not been previously implemented and thus would benefit from additional monitoring to ensure the integrity and effectiveness of the fencing is commensurate with other fencing projects.

PROJECT GOAL(S):

The goal of this project is to reduce unauthorized recreation activities within the monument and to reduce potential for roadway mortalities of desert tortoise and other wildlife within the monument.

PROJECT OBJECTIVE(S):

Activities conducted under this project concept would include construction of up to 4 miles of tortoise exclusionary fencing that would be installed along Corn Creek Road. Up to 2 tortoise guards, 1 gate, and 2 culverts would also be constructed along Corn Creek Road.

PROJECT APPROACH:

Desert Conservation Program will coordinate with the National Park Service, BLM, U.S. Fish and Wildlife Service, and NDOT to assure that all required environmental analyses, surveys, and permits are completed prior to

installation of the fence, gates, and tortoise guards. Desert Conservation Program staff will work with federal agencies and contractors to implement the fencing project.

PROJECT COST

$306,020.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

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 #4 - 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 #5 - This project will address Biological Goals and Objectives D 1.2, by helping to maintain intact functional habitat within the Tule Springs Fossil Beds National Monument by blocking entry to illegal off-road activities and reducing roadway mortalities of desert tortoise and other wildlife, and D 3.1, collaboration with other stakeholders, as we will be collaborating with the National Park Service, U.S. Fish and Wildlife Service, BLM, and NDOT on this project.

NEVADA STATE ROUTE 159 TORTOISE FENCING, PHASE I AND II

BACKGROUND AND NEED FOR PROJECT:

To reduce tortoise mortality along Nevada State Route 159 (SR159), the Desert Conservation Program desires to provide financial and project management assistance for the construction and or installation (retro-fitting) of tortoise fencing along SR159 for approximately 10.5 miles (21 total fencing miles for the east and west sides of SR159).

This project would fund and implement Phase I and Phase II (construction or retro-fitting tortoise fencing from milepost 3 to milepost 13.5). Phase III may be funded in a future Implementation Plan and Budget (construction or installation of tortoise fencing along SR159 from milepost 0 to milepost 3. Under this project, the fencing would reduce unauthorized use and access to sensitive habitats and restoration areas and protect desert tortoises from crossing SR159.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

While new fencing material exists that may, one day, replace the current fencing material, the new material has not been proven to hold up for long periods of times in the desert southwest. 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 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. This project will provide funding for construction of tortoise fencing along SR159.

PROJECT OBJECTIVE(S):

This project will provide funding for tortoise fencing to reduce unauthorized use and access to sensitive habitats and restoration areas and protect desert tortoise from crossing SR159. Activities conducted under this project concept would include:

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 10.5 miles of SR159 (for a total of 21 miles of fencing along both sides of the road). Fencing will be located between milepost 3 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 fence. All fencing installation will be documented by the contactor, GPS data loggers or photographs.

TORTOISE GUARDS, CULVERTS, AND SHADE STRUCTURES TO BE INSTALLED

It is anticipated that up to 10 tortoise guards would be evaluated and installed where needed and up to 4 culverts will be installed. Up to 40 shade structures would be evaluated and installed where needed. Desert Conservation Program will work with BLM, NDOT, 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 assure that all required NEPA, surveys, and highway occupancy permits and requirements are completed prior to installation of the fence and tortoise guards. 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.

PROJECT COST

$718,325.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

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 – This project provides for continued funding of an effective conservation measure.

Principle #5 - 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.

DEMOGRAPHY/POPULATION VIABILITY OF TORTOISES IN TRANSLOCATION SITES

BACKGROUND AND NEED FOR PROJECT:

Population augmentation has been an integral component of the desert tortoise recovery plan since the original version was released by the U.S. Fish and Wildlife Service in 1994. This view was carried forward in the 2011 *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* with renewed emphasis on effectiveness monitoring to gain a better understanding of the long-term impacts of population augmentation on both translocated and resident populations of tortoise and to better understand the role that population augmentation plays in contributing to recovery of the species. However, most effectiveness monitoring work completed to date consists of short-term (generally 5 years or less) studies of survival of translocated individuals. The long-term effects of population augmentation on desert tortoise populations are still largely unknown and there is little published research describing whether and/or how translocated animals actually help augment populations over time.

The Desert Conservation Program has been monitoring a cohort of translocated tortoises on the BCCE since 2014. This project would allow for continued monitoring of translocated and resident tortoises on the BCCE, specifically examining reproductive output of translocated and resident tortoises. If translocated tortoises do not reproduce at a rate similar to resident tortoises, then they may only be causing short-term increases in the population and thus would not effectively augment populations. This will not aid in the recovery of the species over the long term which should be the goal of any augmentation program. This project will give us the first indication as to whether the augmentation efforts are having the desired result.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project is more of a research approach but could also serve as a form of effectiveness monitoring, as reproduction of translocated animals is very important to determine if population augmentation efforts are effective. This project provides the opportunity to learn novel information that could lead to changes in management strategies in the future.

PROJECT GOAL(S):

The goal of this project is to gain a better understanding of the reproductive output over time of translocated versus resident desert tortoise populations.

PROJECT OBJECTIVE(S):

This project has the following objectives:

- Determine reproductive rates for female tortoise for both translocated and resident tortoise
- Determine nest survival rates of all nests
- Determine paternity of the young though genetic testing.

PROJECT APPROACH:

This project would use translocated and resident tortoises at the BCCE. These tortoises are already involved in a radiotelemetry study, which would cut down on initial costs of monitoring and maintenance of transmitters over time and would eliminate the need and cost associated with locating animals to study. Reproductive status of females would be tested tactilely at first to determine whether tortoises are gravid and then with more advanced equipment such as a mobile sonogram to determine clutch size. Gravid individuals will be followed closely until they nest at which time the nests will be monitored until hatching. After hatching, neonatal tortoises will be recorded and biological samples will be taken for use in paternity testing.

PROJECT COST

$250,000.00

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 addresses Biological Goal and Objective D2.2, augmentation of desert tortoise populations. This project will also inform the Adaptive Management Program by providing information on the ability of translocated tortoises to assimilate into populations and on how they contribute to the population over time.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the MSHCP. This project will have a measurable outcome that will not only be informative to the MSHCP but also to other projects involving translocation.

Principle #9 - Addresses program goals identified for the 2019-2021 biennium. This project addresses augmentation of desert tortoise populations.

DESERT TORTOISE PREDATOR-PREY DYNAMICS PHASE II

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. Interest has been expressed in the development of management options which may ameliorate or limit predation pressures. Currently, an investigation into the distribution and abundance of predators, most notably coyote, but also fox (*Vulpes* sp. and *Urocyon* sp.), badger (*Taxidea taxus*), felids (*Felis rufus*, and *F. concolor*), and ravens (*Corvus corax*) is ongoing in the BCCE and the results of that important work are forthcoming. 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. This will be used to interpret and expand the results and conclusions derived from wider predator population investigations of the BCCE and surrounding area. This project will allow for continued funding to complete this 4-year study.

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. Additionally, since translocated desert tortoises in the BCCE are already intensively monitored, this proposed study would present a unique opportunity to evaluate the interactions of a monitored population of translocated desert tortoises in the context of a concurrent study of coyote, mesocarnivore, and leporid interactions via a camera trap network and tracked coyotes, kit foxes, and black-tailed jackrabbits. A better understanding of the predator/prey community will allow us to make better decisions on translocation sites and timing which will lead to more sustainable translocated populations of desert tortoise.

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.

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 (lepids) 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:

- Research prior efforts, both published and unpublished, for propagation of MSHCP covered plant species so that existing knowledge can be built upon.
- Develop successful propagation and germplasm storage techniques for each of the four state-listed plant species.
- Identify conditions which will lead to successful growth of state-listed plants in a nursery setting.
- Identify conditions and techniques which will lead to successful outplanting of nursery plants.

PROJECT APPROACH:

The project will consist of up to ten 1-km 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 36 jackrabbits and similarly capture 10 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

$491,152.20

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

Principle # 4. This project would provide continued funding for a project already being administered and contains funds already approved for use by the Board of County Commissioners.

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.

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.

PROTECTED PLANT SPECIES PROPAGATION RESEARCH

BACKGROUND AND NEED FOR PROJECT:

Available conservation actions to benefit covered plant species are currently limited largely to protection and restoration of existing occupied habitats. In order to ensure the long-term persistence of these species we need to expand the conservation toolbox to consider actions such as restoration of historical habitat, including potential translocation of propagated plants. However, success of these types of efforts has been historically low. This project will increase our knowledge of state-listed plant species (Table 1) reproduction by investigating propagation techniques and the feasibility of establishing nursery populations. The ability to propagate protected plant species in a controlled setting would provide land managers with a wider array of options when mitigating for anthropogenic disturbances, managing protected areas, and in the event of unforeseen population declines.

Table 1
Clark County Plant Species Listed as Fully Protected by the State of Nevada

COMMON NAME	SCIENTIFIC NAME
Las Vegas bearpoppy	*Arctomecon californica*
Threecorner milkvetch	*Astragalus geyeri* var. *triquestrus*
Blue Diamond cholla	*Cylindropuntia multigeniculata*
Sticky buckwheat	*Erigonum viscidulum*

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 and adaptive management approach.

PROJECT GOAL(S):

The goal of this project is to develop successful propagation techniques for MSHCP covered plant species so that nursery populations can eventually be established and utilized for conservation purposes.

PROJECT OBJECTIVE(S):

1. Develop successful propagation and germplasm storage techniques for each of the four state-listed plant species.
2. Identify conditions which will lead to successful growth of state-listed plants in a nursery setting.
3. Identify conditions and techniques which will lead to successful outplanting of nursery plants.

PROJECT APPROACH:

LAS VEGAS BEARPOPPY

Las Vegas bearpoppy is a perennial herb that develops long taproots during early development, making them difficult to transplant. Instead, a persistent soil seed bank is important for maintaining populations of bearpoppy (Megill et al. 2011) and re-introducing this species to areas where seed bank may be depleted due to surface disturbances. Las Vegas bearpoppy appears to have a dormant seed fraction whose germination and emergence conditions are in need of study (Abella et al. 2013). Controlled laboratory trials on seeds collected across populations to preserve genetic diversity will increase our understanding of seed viability, after-ripening conditions, dormancy dynamics, and seed treatments necessary to propagate from seed (Baskin and Baskin 2000). Field-collected seed will also be prepared in nylon seed bags, buried at known locations, and tested through time for viability; this field component determines loss of viability in the seed bank and can inform population viability models throughout this species' range.

BLUE DIAMOND CHOLLA

Cylindric cactus in general are known for their ease and success in vegetative propagation using segments of their jointed stems. Stem segments or seeds collected from wild populations of the Blue Diamond cholla for exploring the propagation of the species would have little impact on overall population survival, and the availability of the species in horticulture may reduce poaching pressure (Baker 2005). Joints sampled from known populations often require well-drained soils, as root rot causes early propagation mortality in many cactus (Desert Botanic Garden, https://www.dbg.org). Different propagation conditions will be tested (e.g., soil mixture, watering amounts and frequencies, rooting hormones) to determine optimal rooting success for the Blue Diamond cholla. If reproduction is successful, as observed during population surveys currently funded by the Desert Conservation Program, fruit will be protected and tracked to maturity, and seeds will be collected for laboratory germination trials by varying scarification and summer temperature combinations.

THREE-CORNER MILKVETCH AND STICKY BUCKWHEAT

The seed ecology and propagation potential for the two protected annual species is poorly understood because seeds can remain inactive in seed bank for many years (Bangle 2009). Soil seed bank samples will be collected in proximity to adult reproductive plants identified during population surveys and transported to the U.S. Geological Survey greenhouse. Samples will be treated with watering/chemical methods using a nine-month emergence method developed for expressing soil seed bank of Mojave Desert species, particularly for winter and summer annuals that include *Eriogonum* spp. and species of the family Papaveraceae (DeFalco et al. 2009, Scoles-Sciulla and DeFalco 2009). Resulting seedlings will be transferred to pots and raised to increase seeds while protecting genetic diversity; pollination trials will also be tested. The resulting seeds, and/or seeds collected from populations identified during population surveys, will be subjected to laboratory trials to understand seed viability, after-ripening conditions, dormancy dynamics, and seed treatments necessary to propagate from seed (Baskin and Baskin 2000). Buried seed bags (as described for Las Vegas bearpoppy) will also be deployed to determine loss of seed viability in the soil seed bank.

LITERATURE CITED

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Baker, M. A. 2005. Current knowledge and conservation of *Cylindropuntia multigeniculata* (Cactaceae), the Blue Diamond cholla. Status report prepared for US Fish and Wildlife Service, Nevada State Office.

Bangle, D. 2009. Report on *Astragalus geyeri* var. *triquetrus* (threecorner milkvetch) and *Eriogonum viscidulum* (sticky buckwheat) within Lake Mead National Recreation Area. Prepared for Lower Colorado River Multi-Species Conservation Program.

Baskin, C. and J. Baskin. 2014. Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination. 2nd Edition, Elsevier.

DeFalco, LA, TC Esque, JM Kane, and MB Nicklas. 2009. Seed banks in a degraded desert shrubland: influence of soil surface condition and harvester ant activity on seed abundance. Journal of Arid Environments 73:885-893

Megill, L., L.R. Walker, C. Vanier, and D. Johnson. 2011. Seed bank dynamics and habitat indicators of *Arctomecon californica*, a rare plant in a fragmented desert environment. West North Am Nat 71:195–205

Scoles-Sciulla, SJ, and LA DeFalco. 2009. Seed reserves diluted during surface soil reclamation in eastern Mojave Desert. Arid Land Research and Management 23:1-13.

PROJECT COST

$137,943.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

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

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 state-listed plant species.

INVENTORY AND ECOLOGY OF PLANT-POLLINATOR SYSTEMS WITHIN RIPARIAN AREAS

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 plants can be self-sustaining, which is heavily influenced by pollinator presence/absence and behavior. Also, understanding where pollination is lacking could lead to improved restoration efforts and connectivity. This project would provide funding to investigate the current ecology of plant-pollinator systems within riparian areas of Clark County so the resulting information can be used 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 goals of this project are to identify plant-pollinator systems in riparian reserve units along the Virgin and Muddy rivers and to examine the potential role of pollination in restoration success and sustainability in these areas.

PROJECT OBJECTIVE(S):

- Identify plant-pollinator interactions in riparian reserve units.
- Identify potential pollinator-dependent plants.
- Identify the potential role of pollination in restoration success and sustainability in riparian reserve units.

PROJECT APPROACH:

Desert Conservation Program staff will 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, invertebrate, and bird species identification and experience in conducting ecological fieldwork in local desert environments. The project will consist of two main activities to achieve project objectives: (1) inventory surveys, and (2) a manipulative study.

APPROACH FOR INVENTORY SURVEYS

Knowing and understanding the plant-pollinator systems within riparian areas in Clark County could improve their function and restoration success.

Beginning in summer 2019, UNLV will work with the Desert Conservation Program to identify riparian units along the Virgin and Muddy rivers that have received and not received restoration. After reconnaissance and starting in fall 2019, vegetation surveys will be conducted (plant species density and cover) to identify the perennial plant community and identify potential important pollinator plants. These surveys will aid in identification of which potential pollinator plants are available for pollinators in the different river systems and restoration types.

Starting in late winter 2020 and into spring, phenology, invertebrate, and bird surveys will be conducted. Certain bird species can be very important pollinators, but which species are important pollinators and the ecology of bird pollination are poorly understood in desert habitats. Phenology surveys will provide an estimated time for a flowering event, emergence of pollinators, and visitation by invertebrates and migratory birds at sites. At least two invertebrate and bird surveys will be conducted per unit to assess flower visitation pre-flowering and during flowering. Invertebrate and bird surveys before a flowering event enable assessment of the potential pollinator population before flower emergence and at the beginning of the bird migration season. Surveys during flowering will provide specific information on pollinator-plant species interactions.

Inventory surveys will include noting habitat utilization by and behavior of potential pollinators (both invertebrates and birds). Notes will be taken of which species are utilizing different plants present in the unit and bird activity or behavior (e.g., birds: grazing/foraging, singing/calling, nectaring, perching; invertebrates: nectaring, potential pollinator event, sitting, etc.). To conduct these surveys, each unit will be divided into transects and observations will be timed to provide equal effort among all transects and units.

Additionally, at two or more pairs per river system, intensive collection surveys will be conducted to more specifically identify pollinators to species. Multiple methods will be used to identify which method or methods would be most suitable to attain quality data for this and future surveys. Collections and observations of invertebrates will be conducted using scientifically accepted methods, including netting, pitfall traps, and pan traps. Sweep netting can be used to compare potential pollinator communities in areas of native shrubs. A targeted shrub or shrub community will be swept within a transect for a designated amount of time or number of sweeps, and at a regulated height. Pan traps of varying colors (yellow, blue, and red) will be placed an equal distance apart on a transect and filled with a solution of water and a few drops of dish soap as a surfactant to collect Hymenoptera, Diptera, and other flying insects. For terrestrial pollinators, pitfall traps and sticky tape can be utilized to allow insect visitors to be collected to identify species of pollen and pollen weight per insect.

The data from the surveys will be analyzed statistically using accepted univariate and multivariate ecological analyses to meet project objectives and address study questions by relating pollinator communities to vegetation in restored and non-restored areas.

APPROACH FOR MANIPULATIVE STUDY

Some plant species are self-pollinating (e.g., several species in Solanaceae Family) or are wind pollinated (known as anemophily; e.g., *Phragmites*) and, therefore, do not rely as heavily on pollinators. However, other species explicitly rely on cross-pollination (e.g., *Arctomecon californica*, the rare plant Las Vegas bearpoppy). To more specifically address whether plants can be self-sustaining and if pollinator presence is important for the

longevity and resilience of riparian pollinator plants, probable pollinator-attractive plants will be identified and a subset of these plants or their flowers will be isolated from pollinators. For smaller plants, whole plants can be "caged" in a sheer tight-weave fabric that surrounds a chicken wire cage to limit accessibility by pollinators to the plant. For larger plants, a loose sack of a sheer tight-weave fabric can be placed around a flowering stem to limit pollinator access. While this treatment may not limit wind pollination, it will reduce likelihood of pollination by an invertebrate. 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.

Analyzing data from this project component will help identify information crucial to the restoration needs of particular plant species, such as how pollination ecology influences seed behavior and potential sustainability of recruitment for restoration.

PROJECT COST

$50,000.00

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. 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 for inclusion in the 2019-2021 Implementation Plan and Budget 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.

BROME REDUCTION AT TROUT CANYON AND STUMP SPRINGS

BACKGROUND AND NEED FOR PROJECT:

Investments in tortoise recovery via population augmentation have been made at Trout Canyon and have been identified for Stump Springs. Red brome (*Bromus rubens*), an exotic invasive species of grass is known to occur at both of these locations. Due to the presence of brome on the landscape, the Trout Canyon area was identified by the U.S. Geological Survey as susceptible to fire (Van Linn et al. 2015), and brome was associated with poorer juvenile tortoise growth and survival at Trout Canyon compared to other translocation sites (Drake et al. 2018).

Pre-emergent herbicides have been effective at reducing the abundance of brome. However, some herbicides are more effective than others in this capacity, and environmental conditions can factor heavily into their efficacy. This project will fund research to identify which herbicides and which application techniques result in the greatest brome reduction. Reducing the amount of brome at Trout Canyon and Stump Springs will decrease the risk of wildfires, increase the success of native plant establishment, and provide opportunities for better nutrition to the desert tortoises at these locations.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project lends itself favorably to an adaptive management approach. There are many uncertainties regarding the type of herbicides, timing of herbicide application, and application techniques that could play a role in the effectiveness of the brome reduction projects. Furthermore, information gleaned from this project could lead to changes in land management, restoration, and fuels management.

PROJECT GOAL(S):

The goal of this project is to improve the quality of desert tortoise habitat at Trout Canyon and Stump Springs by reducing the abundance of brome.

PROJECT OBJECTIVE(S):

- Compare the success of brome reduction using two kinds of herbicides over the course of at least two years.
- Compare the effects of these herbicides on native vegetation within the treated areas.

PROJECT APPROACH:

Desert Conservation Program staff will work with U.S. Geological Survey researchers to implement a controlled study. Experimental plots will be established at Trout Canyon and Stump Springs. The number and size of plots will be determined by site conditions. Two herbicides (Esplanade and Plateau) will be tested against an untreated control using a randomized complete block design. Test factors will include herbicide type, dosage, and timing of application. Half of the treatment plots will be treated at least two months before the first expected germination of annual grasses, and the other half will be treated after annual grasses have started to emerge.

Plots will be assessed at the time of treatment and for two consecutive summers after treatment. Metrics will include:

- Percent bare ground
- Percent cover by species for annual grasses and other annual weeds
- Percent cover by species for desirable species
- Phytotoxicity by species for desirable species (to be assessed only post-treatment)

PROJECT COST

$22,300.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

Principle #5 – Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program; specifically, objectives D1.2 restore degraded habitat, and D1.4 control and remove invasive and non-native plant species.

Principle #7 - Focuses on projects with measurable outcomes that are pertinent to the Multiple Species Habitat Conservation Plan (MSHCP). This project will have measurable outcomes in the form of acres of invasive weeds treated.

Principle #9 – Addresses program goals. This project addresses the goal of restoration of desert tortoise habitat.

UNDERSTANDING THREATS TO THE PERSISTENCE OF NEVADA GILA MONSTERS

BACKGROUND AND NEED FOR PROJECT:

Gila monsters (*Heloderma suspectum*) have been recommended to be included on the list of covered species under a proposed amendment to the MSHCP and associated incidental take permit. However, basic information on demography and threats to this species is currently lacking, which will impact our ability to develop an effective conservation strategy for this species.

Gila monsters are among the rarest and most secretive animals in Nevada. As a result, we currently lack basic information to assess species status and how the species will be affected by changes in habitat (i.e. development, degradation, fragmentation) and climate. Gila monsters in Nevada primarily occur in Clark County, with only small portions of their range extending into Nye (southeastern) and Lincoln (southern) counties, but due to rarity, our knowledge of the extent of this species is incomplete. This project will focus on determining the multi-scale habitat requirements for Gila monsters across southern Nevada (Clark County) and assess how connectivity among populations may influence potential for species persistence. Information from field surveys will be combined with estimates of habitat connectivity and genetic diversity to provide spatially-explicit models of population persistence and identification of areas with the greatest management need. These models will be used to gage how Gila monster occurrence and persistence is likely to change in the future, given the scenarios for continuing development, environmental alteration, and climate change.

ADAPTIVE MANAGEMENT REVIEW SUMMARY:

This project will provide information to inform development of an effective conservation strategy for Gila monsters. While not necessarily a project that lends itself to an adaptive management approach, given that it has a research focus, resulting projects that stem from this research would more than likely be suited for an adaptive approach to implementation.

PROJECT GOAL(S):

The goal of this project is to combine data regarding the habitat requirements, geographic distribution, and genetic diversity of Nevada Gila monsters into a spatially-explicit model to determine specific threats to species persistence and the identification of current and future critical management needs.

PROJECT OBJECTIVE(S):

- Determine the environmental features, habitat requirements, and patterns of habitat use that dictate Gila monster occurrence in Nevada.
- Incorporate GIS layers representing additional habitat requirements (micro- to landscape level) into spatially-explicit species distribution models (SDM) previously developed by Nussear et al. (2018) using an ensemble approach (e.g. combinations of Random Forest, General Additive Models, and Maxent, etc). Extend distribution models to consider potential scenarios for future changes (habitat and climate).

- Combine habitat use and movement data (telemetry) to model dispersal-limited habitat connectivity using relevant topographical, geological, environmental, and anthropogenic features.
- Analyze genetic samples to determine gene flow and genetic diversity among populations in Nevada. Combine analyses of gene flow, genetic differentiation, and recent migration rates with habitat suitability/connectivity models to determine the genetic diversity landscape of Gila monsters.

PROJECT APPROACH:

The project will be a multi-institution collaboration with respective institutions being responsible for completing specific project objectives. Collaborators will include personnel from Nevada Department of Wildlife, U.S. Geological Survey, and regional Universities.

Methods will include field work to determine critical habitat features, to monitor lizard movements and habitat use, and to collect blood samples for genetic analysis. Spatially-explicit habitat suitability and connectivity models will be developed, and models will be expanded to consider future scenarios for development, habitat alteration, and potential climate change. Finally, genetic analyses of samples will help determine genetic diversity, gene flow, and associated landscape factors.

PROJECT COST

$354,000.00

BUDGET PRINCIPLES ADDRESSED BY THIS PROJECT CONCEPT

This project addresses the following budget principles:

Principle #5 – Advances projects that support achieving Biological Goals and Objectives or those that are designed to inform the Adaptive Management Program. This project meets objective D3.1 to collaborate with other stakeholders and D4.2 to identify critical uncertainties.

Principle #8 – Advances the amendment of the MSHCP and its conservation strategy by providing critical data necessary for the development of an effective Gila monster conservation strategy.

Principle #9 – Addresses program goals. This project addresses the goal of continuing to expand species and habitat monitoring under the Adaptive Management Program by providing insight into what degree of genetic and population connectivity currently exists in Gila monster populations of southern Nevada.

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	Avian surveys and monitoring in riparian areas: Fund baseline bird surveys to establish a record of bird species currently present on riparian reserve units. This baseline record will allow us to track changes in bird populations in riparian areas and can be used to measure the success of future restoration and management activities in these areas. Riparian species may be particularly vulnerable to future drought and baseline surveys and monitoring can provide better information on the conservation needs of these species in the future.	Agreed. This work was initially funded in the 2017-2019 Implementation Plan and Budget. The first surveys on existing properties were completed in 2017 and additional surveys on newly acquired properties were conducted in 2018. Funding to continue avian monitoring is included under the Adaptive Management Program budget.
U.S. Fish and Wildlife service	Vegetation surveys and monitoring for protected plant species: Conduct baseline surveys for protected plant species and implement monitoring of surveyed populations. This baseline record and ongoing monitoring will allow us to track changes in vegetation communities resulting from anthropogenic activities (e. g., climate change) and will help to identify areas of concern. Similarly, conduct habitat suitability surveys for listed plants, which will aid in the identification of future conservation and/or translocation areas. This is especially important for covered plant species that appear to be habitat deficient in future proposed reserves. Finally, consider funding research or projects that explore conservation alternatives, such as identification of successful propagation techniques and establishment of nursery populations for covered plant species.	Agreed. Funding to conduct surveys for state-listed plants was included in the 2017-2019 Implementation Plan and Budget. This work was included as partial mitigation for a proposed Master Permit with the Nevada Division of Forestry that would provide County-wide coverage for state-listed plants and is pending the successful negotiation of that permit. Additional work to identify areas of suitable habitat is included in this Implementation Plan and Budget as Project Concept #20 (Protected Plant Species Propagation Research).
U.S. Fish and Wildlife service	Awareness and outreach: Continue to develop and support outreach activities designed to encourage better understanding and positive behavior regarding protected species and desert conservation. Examples include encouraging Clark county residents to decrease backyard breeding of captive desert tortoises and promoting positive recreation behavior around the Spring Mountains and other popular recreation areas. Public education campaigns have been very successful in the past (e. g., Mojave Max), and can lead to helpful conservation actions and outcomes for many different species.	Agreed. The following project concepts address this recommendation: Concept #4 (Public Information, Education, and Outreach Program), Concept #9 (Implementation of "To the Max" Campaign), and Concept #10 (Education for Construction Personnel). One additional project to address education for the OHV community on the topics of invasive species and desert tortoise impacts was also identified and will be funded out of remaining funds from the 2017-2019 Implementation Plan and Budget.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife service	Habitat connectivity for lizard species: Fund research or studies designed to assess current or future habitat connectivity for lizard species of concern (banded gecko, Gila monster, etc.), which may also help to answer questions about genetic and population connectivity. Many lizard species are microhabitat specialists, thus occurrence and distribution are sensitive to minor alterations in environmental conditions. Other desert species display similar ecological preferences, and connectivity modeling efforts for lizards may provide information pertinent to additional covered species.	Partially agreed. While there is inherent value in a study of this nature, the cost of such research can be steep. Lizard species currently covered by the MSHCP are proposed to be dropped under the amended MSHCP in favor of species that are more significantly impacted by private-land development activities. The Desert Conservation Program has worked with Nevada Department of Wildlife staff to identify a similar project concept that would specifically address Gila monsters (proposed for coverage under the amended MSHCP). This project, Concept #23, would seek to describe threats to Gila monsters in southern Nevada and would provide a spatially-explicit model that would assess how connectivity among populations may influence potential for species persistence.
U.S. Fish and Wildlife service	Reproductive output or survival and habitat characteristics: Measure reproductive output of female desert tortoises or survival of either sex (or perhaps population growth rates) at the Eldorado, BCCE, Trout Canyon, and Hidden Valley translocation sites relative to vegetation or other habitat metrics. Examining these demographic parameters in relation to habitat characteristics can provide information about optimum habitat conditions for the species, and be incorporated into management, monitoring and planning documents. Overall it will improve understanding of factors that contribute to greater than average recruitment, and information would support habitat restoration and population augmentation efforts.	Agreed. This work is further described in Concept #18, Demography/Population Viability of Tortoises in Translocation Sites.
U.S. Fish and Wildlife service	Brome reduction and native plant establishment at Trout Canyon and Stump Springs: Investments in tortoise recovery via population augmentation have been made at Trout Canyon and have been identified for Stump Springs. The Trout Canyon area was identified by USGS as susceptible to fire (based on Van Linn et al. 2015). Brome was associated with poorer juvenile-tortoise growth and survival at Trout Canyon compared to other translocation sites (Drake et al. 2018 DTCS presentation).	Agreed. Funding for the first phase of this work is identified in Concept #22, Brome Reduction at Trout Canyon and Stump Springs. This project entails investigating two types of herbicide thought to be effective in treating widespread brome invasions.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife service	Installation of desert tortoise fencing along unfenced highways in Clark County: See Recovery and Implementation Team (RIT) proposals for SR 159 and US 95. Related fencing questions have to do with a) solving fencing issues associated with at-grade roads and fence blow-outs during flash floods, and b) developing an effective design for modified cattle guards to keep tortoises from by-passing exclusion fencing at open gates.	Partially agreed. Following discussions with the Desert Tortoise Recovery Office, SR159 was identified as the higher priority of the two proposed fencing projects. Since fencing projects require months to years of planning before construction can begin and costs for these types of projects can be steep, the Desert Conservation Program will move forward with the higher priority fence project at this time. If funding for Highway 95 fencing is still needed during the next biennium, then it will be considered for the 2021-2023 Implementation Plan and Budget.
U.S. Fish and Wildlife service	Baseline support for volunteer maintenance of existing tortoise exclusion fencing: Provide basic materials for a group of volunteers (coordinated by Tortoise Group) to survey existing tortoise exclusion fencing, conduct minor repairs, and document road kills. Separate funding is being pursued for this purpose, but it that funding does not come through, this would be a small funding need to provide basic safety equipment and supplies for the volunteer crews.	Agreed. This work is further described in Concept #11, Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing.
U.S. Fish and Wildlife service	Road Warriors: Citizen Scientist Monitoring for Mojave Desert Road Mortality and Live Encounters to Identify Priority Areas for Fence Installation: see RIT proposal. Desert tortoise mortality and illegal capture along roads and highways has been identified as a significant issue relative to recovery of this species. 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.	Agreed. This work is further described in Concept #12, Road Warriors: Citizen Scientist Monitoring for Mojave Desert Road Mortality and Live Encounters to Identify Priority Areas for Fence Installation.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Geological Survey	Effects of Exotic Forage on the Nutrition, Physiology, and Gut Microbiota of Mojave Desert Tortoises (*Gopherus agassizii*): Understanding the associations between diet, gastrointestinal tract microbiota, physiological status, immune function, and animal response will aid in the management and recovery for Mojave desert tortoises by improving 1) animal husbandry and head-start programs for individuals held in captivity, 2) assessments of tortoise health and the pathogenesis of diseases by modifying protocols and diagnostics used evaluate animal condition, and 3) knowledge on the link between habitat composition and quality with improved conditions for tortoises.	Agreed. This work will be funded with remaining funds under the Adaptive Management Program budget from the 2017-2019 Implementation Plan and Budget.
BLM/ County Commissioner	Post-and-cable fence to protect portions of the Sunrise Mountain SRMA: construct post-and-cable fencing in the vicinity of the Great Unconformity to reduce unauthorized recreation and protect species habitat.	Agreed. This work is further described in Concept #13, Sunrise Mountain Environmental and Geological Protection Barrier.
Science Advisor Panel	County-wide surveys for MSHCP-listed plant species: There appears to be only minimal or vague information on the distribution and habitat requirements of many of the MSHCP-listed plant species, even though they comprise 52.5% of the currently covered species. Knowing where these plants occur or are expected to occur is critical to conserving them under the MSHCP. Further, many of the currently-listed plants are expected to transition to any amended list as they are also state-listed species.	Agreed. Funding to conduct addition surveys for state-listed plant species was identified in the 2017-2019 Implementation Plan and Budget and project kick-off is pending successful negotiation of a Master Permit with the Nevada Division of Forestry. Additional funding to conduct surveys for all species proposed for coverage under an amended MSHCP (including plant species) was also identified in the 2017-2019 Implementation Plan and Budget. This project was nominated for funding under Round 17 of SNPLMA and has been recommended for funding by the SNPLMA Partners Working Group and Executive Committee. Round 17 is currently pending final approval by the Secretary of the Interior.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor Panel	Desert ecosystem baseline inventory and long-term monitoring program: Protocols adopted for baseline inventories and long-term monitoring on reserve lands will ideally facilitate comparisons with monitoring programs in use on lands managed by other agencies and, where appropriate, follow established protocols for individual taxa of interest. Ecosystem and habitat monitoring protocols should include stratified, multi-scale sampling that encompasses a broad range of variability and enables extrapolation to larger areas of interest. Information from long-term monitoring is critical for establishing realistic quantitative goals for ecological restoration projects. Furthermore, protocols used for long-term monitoring can be used to guide development of effectiveness monitoring of these restoration projects. Thus, the inventory and monitoring program should be developed and implemented concurrently with the BCCE Restoration Project if not sooner.	Not included at this time. Given current limitations on budget expenditures for each biennium, the Desert Conservation Program cannot implement a monitoring program at the scale currently suggested by the Science Advisor Panel. Additionally, several collaborating agencies are conducting a wide variety of projects across the Mojave and in southern Nevada with similar goals and objectives – the results of which may be leveraged to implement effective restoration programs in the future.
Science Advisor Panel	Comprehensive riparian monitoring for adaptive management and documenting habitat improvement: Detection of change, whether induced or natural, is dependent on high quality data on targeted processes, gathered at appropriate time and spatial scales. Monitoring of riparian habitat varies by purpose: 1) for determining the success of a method or action (implementation monitoring) for a short time after project completion; 2) for determining if a project or action has changed the desired habitat characteristic (effectiveness monitoring); and, 3) broad, ecosystem-wide trends that can directly or indirectly affect project success (long-term trend monitoring). In riparian areas, monitoring should include all pertinent processes (hydrology, geomorphology, and vegetation are typical) and targeted habitat characteristics. This project idea ties directly to riparian mapping and is highly recommended for current and planned projects on Muddy and Virgin Rivers.	Not included at this time. The Desert Conservation Program has recently completed two ecohydrological assessments that cover the entirety of the Virgin River within southern Nevada. These assessments establish existing conditions and provide recommendations that pertain to restoration and property acquisition. Additionally, LiDAR acquisition and vegetation mapping projects are currently underway or are proposed for the near future. These projects will contribute significantly to completing this recommendation. Desert Conservation Program staff will continue to work with the Science Advisor Panel during the upcoming update to the Riparian Reserve Units Management Plan to identify any additional specific monitoring protocols that should be implemented.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor Panel	Inventory and ecology of plant-pollinator systems within riparian areas: A lot of time and money has been spent on acquiring and restoring riparian areas in Clark County. One component of these areas is whether the plants within them can be restored and be self-sustaining. Pollination plays a large role in the reproductive success of plant species, whether it is by wind or insects. Understanding the role pollinators play in the function of these riparian areas could be valuable.	Agreed. This work is further described in Concept #21, Inventory and Ecology of Plant-Pollinator Systems within Riparian Areas.
Science Advisor Panel	Identify thermal refugia used by riparian bird species: The availability of thermal refugia could play an important role in maintaining suitable habitat for MSHCP-covered birds. The effort for this project could be combined with the current effort to monitor the occupancy of MSHCP-covered species in riparian areas and would be dependent on detailed riparian corridor mapping. It is also important to know if the restoration of riparian habitat will require establishing thermal refugia areas. Under climate change, the reproductive success of some bird species may rely on finding thermal refugia for their nests and eggs to prevent them from becoming inviable.	Not included at this time. This work may be accomplished, in part, through analysis of LiDAR data, A separate project to acquire LiDAR data for the Muddy and Virgin rivers is currently underway.
Science Advisor Panel	Map desert riparian areas and corridors within Clark County: Using high-resolution remotely-sensed data will provide improved mapping of the desert riparian areas within Clark County, more specifically the Virgin and Muddy River areas. These data will help identify suitable breeding habitat and thermal refuge for riparian birds, as well as potentially provide information on riparian processes such as channel extent and complexity. Additionally, these data could identify functional corridors between riparian areas.	Agreed. Funding for LiDAR acquisition was included in the 2017-2019 Implementation Plan and Budget and a contract is currently underway. The Desert Conservation Program will work with the Science Advisor Panel to ensure that LiDAR data are analyzed appropriately. Additionally, funding to prepare a fine-scale County-wide vegetation map in accordance with National Vegetation Classification System protocols has been identified in Concept #14, Permit Amendment – Vegetation Map. This project would include creating finer-scale vegetation mapping units for riparian areas within the County.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor Panel	Map mesquite/acacia and playa areas within Clark County: Acquire and analyze high-resolution remotely-sensed data to improve the mapping of these habitat types that are potentially showing a disproportionate loss due to location of building permits within Clark County. LiDAR data could help with accurately mapping these habitat types within Clark County and determining if they are being lost at a disproportionate rate. In addition to the LiDAR data, ground truth points may be needed to verify the location of the habitats and validate the mapping of the vegetation types.	Agreed. See response provided above.
Science Advisor Panel	Develop accuracy assessment of ecosystem or vegetation mapping of Clark County properties: Collect independent vegetation occurrence data with which to validate the ecosystem or vegetation map for Clark County. Data can be collected systematically within each vegetation type or ecosystem to determine the accuracy of each mapped category. Alternately, some existing vegetation occurrence data could be set aside and not used in the development of the map but used instead to validate the map. However, the best approach is to gather independent data to conduct the accuracy assessment. Collecting independent field data at regular intervals (i.e., every 3-5 years) to do accuracy assessments could be valuable.	Agreed. This work is further described in Concept #14, Permit Amendment – Vegetation Map.
Science Advisor Panel	Education for construction personnel: Educating construction workers is an important component of maintaining compliance with the County's goals and objectives. Our understanding is that the current requirement is for a few construction personnel for any given project to attend a dust class, which includes a 5-minute video for desert tortoise awareness training. This project would expand on that requirement to include awareness education via brochures (in English and Spanish) available at points of contact with construction personnel, emailing key construction personnel a list of BMPs, and/or a phone contact.	Agreed. This work is further described in Concept #10, Education for Construction Personnel.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor Panel	Tortoise awareness and invasive species education during OHV permitting: Currently, it appears there is limited information on the https://ohv.nv.gov website for desert tortoise awareness, or for reducing the spread of invasive species. There may be opportunity to provide best practices for minimizing weed spread and to increase tortoise awareness during the OHV registration process (e.g. remember to rinse your bike/buggy before going to a different OHV area, don't drive on the berm where invasive plants and seeds may reside, etc.). In general, invasive species start along roadways then spread outward into open habitats, so education targeting OHV road users would be beneficial. Furthermore, if people can register using an app, embedding safety and education reminders during the process could target a captive OHV audience.	Agreed. This work will be funded from remaining public information, education, and outreach funds that were identified in the 2017-2019 Implementation Plan and Budget.
Science Advisor Panel	Conceptual models – identify data gaps and uncertainties: Conceptual models are a tool to aid in the design of biological monitoring plans (Atkinson et al. 2004, Manley et al. 2000). The process of developing these kinds of models can help define the most important elements that impact the species being monitored. A conceptual model approach could refine and focus management actions for species the Desert Conservation Program has identified as having substantial data gaps. Specific efforts may include a literature search or a focused workshop to gain stakeholder consensus and identify information or management gaps which then help build the conceptual model.	Partially agreed. Conceptual models for some bird species proposed for coverage under an amended MSHCP have been completed under previous contracts. Additional work towards creating conceptual models for proposed covered species could be completed as part of the larger effort towards obtaining an amended MSHCP and incidental take permit.
Science Advisor Panel	Fire-risk modeling: The County has acquired additional reserve lands in the past few years and we recommend considering a fire-modelling project that extends beyond desert tortoise habitat into riparian areas. Modeled variables and desired outcomes may vary depending upon ecosystem type and MSHCP-covered species.	Not included at this time. Approaches to reducing risk of fire within riparian areas are well established, thus any benefit realized from this project is expected to be minimal. Therefore, this project was eliminated from further consideration in order to meet budget goals for the biennium.

AGENCY	FUNDING RECOMMENDATION	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor Panel	Incorporate climate change into modeling: We recommend incorporating climate change into models where it is possible and relevant. This recommendation is not for a specific project; rather it is intended to encourage the County to seek out opportunity to add a climate change component into ongoing and/or upcoming modeling projects. Example projects that could include a climate change component may be the connectivity modeling project, or expanding the SDM modeling effort to include a climate change scenario.	Agreed. Desert Conservation Program staff will continue to collaborate with the Science Advisor Panel and other contractors to ensure that climate change is appropriately considered in planning and execution of projects.

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ATTACHMENT F

Summary of Stakeholder Comments and Reponses

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COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife Service	6	Wow! This seems like a really high amount, a big chunk of the budget. After our conversation, now I understand that it is for 5 years. You might want to include that info somewhere.	Text revised. The project concept now mentions the 5 year time frame in both the goal and objective sections.
NDOW	8	The project numbers for Discretionary Conservation Projects appear to be off, and so the project 'Understanding Threats to the Persistence of Nevada Gila Monsters' has been omitted with its associated budget of $354,000. 'Riparian Restoration' should be concept number 8 and all subsequent projects should be renumbered accordingly and budget numbers should be rectified where needed.	Text revised. Table has been corrected to include the Gila monster project numbers for all discretionary projects have been adjusted.
U.S. Fish and Wildlife Service	8	Looks like # 8 was skipped here. And the final proposal for Gila monsters is not in the list. I'm thinking that is just a typo, since the budget does not account for $354,000 (cost of the Gila monster project).	Text revised. The table numbering has been corrected and the Gila monster project has been added.
U.S. Fish and Wildlife Service	8	Again, a really high amount, especially when viewed in comparison to all others. Why is this project so expensive?	Text not revised. The U.S. Fish and Wildlife Service protocol for this particular project requires a very large effort with somewhere between 12 and 18 field personnel. This also covers data analysis and project management and all the equipment and training associated with this large of a project. The previous phase of this project was competitively bid on and the lowest bidder was chosen. We have worked with U.S. Fish and Wildlife Service in recent years to cut the yearly cost of this project by almost half and any further cuts would need to be approved by the U.S. Fish and Wildlife Service and the Desert Tortoise Recovery office. We would be more than willing to discuss plans for a further reduction to this cost but have received push back in the past to any further decrease in effort.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife Service	B-1	Not sure if many of the projects address this goal? Riparian restoration sort of, maybe? The other goals seem to be well covered by multiple projects though.	Text not revised. Property acquisition and restoration projects, while not explicitly stated, also benefit mesquite/acacia habitats. Property acquisition funding was identified in previous biennia. Riparian restoration projects will also result in the creation of mesquite and acacia habitat, as these will provide foraging habitat for covered riparian bird species. Vegetation mapping projects will also help to better identify where mesquite/acacia habitats occur so we can better track potential impacts.
U.S. Fish and Wildlife Service	C-1	Supposed to be 2019-2021?	Text revised. Corrected as suggested.
U.S. Fish and Wildlife Service	C-3	What does this mean? Priority within Clark County? Where does the other 50% of the salary come from? If it is a Desert Conservation Program attorney, wouldn't the entire salary come from Desert Conservation Program?	Text not revised. We have one Deputy District Attorney that is assigned to work 50 percent of their time for the Desert Conservation Program, thus 50 percent of that person's salary is funded by the program. The other 50 percent is paid for accordingly by the department(s) to which they are assigned (currently, Department of Family Services).
U.S. Fish and Wildlife Service	C-3	Typically salaries are included in admin costs, in the context of discussions related to high overhead, etc.	Text not revised. Correct, salaries have been included with the Administration budget. This text attempts to provide additional clarification on the proportion of staff time that is spent on implementing conservation actions.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife Service	C-3	11 FTEs, $3,202,262 for two years of salaries, equals about $146,000 per FTE per year. Did I do the math right? If so, it does seem a little high, even considering benefits (which are usually about 30% of salary costs). Are these salaries in line with what similar positions in the area would pay? If so, you might want to include that information. I'm generally the last person to criticize salaries for being too high, since I think conservation professionals are constantly underpaid. But they do seem high, so a justification or explanation here might be a good idea.	Text not revised. The Desert Conservation Program currently has 11 FTE positions filled, with authorization for up to 18 FTEs. We maintain 18 FTEs to provide staffing flexibility should we need to scale up staff in the future. In order to maintain 18 FTEs, the County requires that we budget for these positions, even if they remain vacant. The total budget for all staff salaries and benefits for the biennium is $4,269,683 (see Project Cost breakdown on Page C-4). This provides salary and benefits for 18 FTEs for 2 years (approximately $118,602 per FTE per year). Benefits as a percentage of salaries is approximately 45 percent, broken down as follows: • Group insurance: 11 percent • Medicare: 1 percent • PERS: 26 percent • OPEB: 6 percent • Industrial insurance: 1 percent Unspent funds for vacant positions will be reabsorbed into the fund balance at the end of the biennium and will be available to spend in future biennia.
Science Advisor	C-5	This section concludes: "the decision on what control measures to implement is probably best left to the professionals implementing the contract." This is problematic for several reasons since the contractor and Desert Conservation Program may have different goals, contractors are unlikely to adopt an adaptive management approach unless it is explicit in the contract, and it obscures who is ultimately responsible for proper management of the BCCE. The decision may be jointly decided by the Desert Conservation Program and the contractor, or the contractor may have some decision-making responsibilities under guidance by the	Text not revised. The precluding part of that phrase was left out "as long as the weeds are controlled in an efficient and cost effective manner…" which implies that we will monitor the situation and if it ceases to be efficient or cost effective we will step in. Adaptive management is not a zero cost endeavor so we need to spend our money wisely and something that is currently working properly and being handled by professionals does not seem like the best place to currently allocate extra resources. Also this is not the actual contract just a summary of whether we think adaptive management is appropriate at the time of the project concept was written. That does not mean that it cannot be added when the

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
		contract with the Desert Conservation Program. This can be cleared up by revising this last phrase.	contract is created or if we were to lose faith in a contractor's ability to make these decisions over time.
Science Advisor	C-8	Clarification on what is being maintained, and what is being monitored would be helpful – e.g. the property is being maintained, and <insert bird/plant/weed> species are being monitored using approved and science-based methods.	Text not revised. The property is what is being monitored and maintained, as a condition of the permit.
Science Advisor	C-16	Under the Adaptive Management section, can further explanation be provided about why U.S. Fish and Wildlife Service needs to change the Recovery Plan for this project to be included in the AMP? If this project may not be included in the AMP, then is it correct to list BO 2.1, which monitors and adaptively manages DT populations?	Text revised. The issue is that this method of survey is required in the current recovery plan so unless U.S. Fish and Wildlife Service is on board with making that change then there is no benefit to trying to find other methods. Also the cost of this project makes attempting other methods problematic. However, as stated in the write-up this project is used in determining the effectiveness of other large-scale management actions therefore Biological Objective 2.1 would apply.
Science Advisor	C-16	I am not clear on the objectives, which state that the population estimates will be conducted over a 5-year period, but the current estimates are over 12 years. Objectives also state bi-annual (twice per year) estimates of density will be obtained. Is that correct? Maybe more explanation is needed on this project for it to be clear to me.	Text revised. Currently there are 12 years of data but for delisting the U.S. Fish and Wildlife Service requires 25 years of increasing populations at all sites. So we are continuing to gather data until we reach that milestone or until there is a change in the delisting requirements. Bi-annual was changed to biennial.
Science Advisor	C-16	I did not see this project listed in the previous IPB report even though it is a long-term monitoring project. Why was it absent from the previous report or why is it present in this one?	Text not revised. This project is funded for 4 to 5 years at a time through the Southern Nevada Public Lands Management Act. Therefore this project would be in the 2015-2017 IPB and no additional funding was needed in 2017-2019 IPB.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife Service	C-17	Same question as before: Why is this project so expensive? Is it really needed? Does it really contribute to conservation and is it really the best use of limited funds? Might want to include more justification, since this one project takes a huge chunk of the budget.	Text not revised. As to justification, positive data from this project is the only way, outside of federal legislation, that the desert tortoise can be delisted which is our main justification. This is a project that was requested by the U.S. Fish and Wildlife Service, specifically the Desert Tortoise Recovery office, and I would direct all comments regarding its merit as a costly project to them.
Science Advisor	C-17	I think this project is vital for monitoring desert tortoise populations, but it has a very high cost too. Could citizen science data reduce this cost? I know typically citizen science data cannot be applied to population estimates, but there are some efforts to do that with ebird data. Also, citizen scientists could be trained to do line distance sampling.	Text not revised. The current contract takes advantage of the AmeriCorps program to bring the cost down to the current level. The work requires long hours in rugged terrain for approximately 3 months working 5 days a week for more than 10 hours a day in some situations. It would be very difficult if not impossible to find the number of people required to collect this amount of data in the window available. The only feasible way to reduce costs would be to further modify the protocol or to change the requirements of delisting and incorporate a more cost effective survey method into those requirements.
NDOW	C-18	We strongly support continued efforts to assess the state of translocated and resident desert tortoises, and the effectiveness of translocations for tortoise conservation. Long-term assessments are critical for such a long-lived animal and will prove invaluable for supporting an adaptive management approach for planning future translocations.	Text not revised. Thank you for your support, we also believe that this is a crucial area of study that will be important to ensure the success of future planning processes

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-20-21	The Adaptive Management section is vague about how adaptive management might be integrated into the project. This would be OK if the Project Approach section was explicit about how contractors will be expected to include adaptive management approaches. However, the budget for this project concept may be inadequate to fully support an adaptive management approach.	Text not revised. A monitoring component will be included in the design and implementation plans for these projects. As this is a concept, the Project Approach section wasn't explicit because these projects haven't been fully designed and details have yet to be determined. In addition, we may decide to conduct the monitoring internally which would save on costs.
NDOW	C-22	We question whether the message "Shred to the Max", in relation to OHV use, is appropriate when promoting conservation of desert tortoises in southern Nevada. OHV use results in the death and injuries of many tortoises annually, and can degrade habitat quality in many cases. We suggest that visual media depicting OHV users engaged in high-speed driving in tortoise habitat (e.g., open desert terrain) creates a mixed message and does not appear to overtly convey the message of driving responsibly and being aware of the need to protect desert tortoises and their habitat.	Text not revised. While we understand your concern with the use of the word "shred" in our To the Max messaging, our public outreach program takes a multi-prong approach to bring messages of environmental responsibility to different user groups. We use specific language and imagery to give our message a softer feel (avoid coming across a lecturing or talking down to user groups) and to appear approachable and collaborative. We will continue to work in a variety of ways to spread the message of responsible recreation while trying to build a more collaborative and cooperative relationship with the OHV community.
U.S. Fish and Wildlife Service	C-22	"knew" should be "new"	Text revised. Corrected as suggested.
U.S. Fish and Wildlife Service	C-26	Add "Program" to Desert Conservation	Text revised. Corrected as suggested.
Science Advisor	C-26	Having standardized data forms to record other small details might be helpful – e.g. location, how it was damaged (run-off/flooding vs. OHV user cut fence vs. was not installed properly, etc.) may provide details on what spots might be targeted for inspection in the future should the program continue.	Text not revised. WU.S. Fish and Wildlife Service will be taking the lead on this project and will determine whether standardized data forms are the approach they want to take. We will pass on your message when this project moves forward.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife Service	C-28	This project that would provide important data that will be used to inform prioritization of areas for installation of tortoise fencing. We have been developing a model to identify high priority areas for tortoise fencing and culverts. Part of that evaluation will also include systematic road kill surveys to "ground-truth" our model and identity the most high risk areas. The Nevada Department of Transportation (NDOT) has a limited budget for tortoise fence maintenance and only a small staff for inspecting existing fencing. The citizen volunteers will be trained to conduct fence inspections, make small repairs, and report areas in need of significant repairs. The NDOT has expressed great support for this proposal and has offered to provide training to the volunteers. We currently have no systematically collected data for evaluating the actual effects of road mortality and capture to tortoise populations within these sites, and potential benefits of tortoise fence and culvert installation. Such data could provide additional support for proposals to fund installation of tortoise fencing projects.	Text not revised. Thank you for your support of this project.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-28	Suggest considering tying this in to PIE and the "To the Max" campaign. If a simple phone app or website were created for the general public to input mortalities, it could dramatically increase participation and reporting beyond what the members of The Tortoise Group will be able to achieve. Results from systematic carcass surveys by The Tortoise Group could be used to rectify incidental and spatially-biased reporting by the general public. App / website could be advertised on "To the Max" electronic billboard advertisements as "What you can do to help!"	Text not revised. This is a great idea and we will discuss this with U.S. Fish and Wildlife Service as this project moves forward. Additionally, the Desert Conservation Program is currently looking into the development of an app that would promote the collection of data using citizen scientists. We will keep these suggestions in mind as we move forward with that effort.
Science Advisor	C-28	Fencing inspection and minor fence repairs under project approach are not listed in the objectives.	Fence maintenance and minor repairs will be conducted under a separate project (see Concept #11, Support for Volunteer Maintenance of Existing Tortoise Exclusion Fencing). References to fence inspection and repairs have been removed from this project concept.
Science Advisor	C-28	Be more explicit under the Adaptive Management section. Can this project include adaptive management? I think the project goals do lend themselves to applying adaptive management. Are the model input variables for the GIS model known? If so, then the project objectives could be focused around making sure the model input variables are collected in this project. Are these data going to validate or inform the GIS-model? Does this project overlap with the volunteer maintenance of tortoise fencing? If so, explain how they are separate projects rather than just one project in which the volunteers help with different aspects of the same project.	Text not revised. This project is about identifying locations for future management actions to occur. The management actions in question are well understood with little uncertainty in their methods. Fencing has been an accepted method to reduce tortoise mortality for years so adaptive management will add very little value to this project as a whole. However this project will help to identify prime places for the placement of fences and signs where they will have the most affect making this project very crucial to a structured decision making approach. Currently this project is set to look specifically at road mortalities but the project may ultimately overlap with volunteer maintenance of tortoise fencing. They were kept separate due to financial concerns but that does not preclude us from combining the project later if it is deemed appropriate.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-33	What is a vegetation-based ecosystem GIS dataset? I would suggest 'a spatial vegetation database'. Does that correctly describe it? I would also suggest re-wording the next sentence to 'The original land cover data based on USGS-GAP (1996 - provide a cite, if possible) was used as the first vegetation map for Clark County. It was modified to include mesquite/acacia vegetation (BLM 1997-provide a cite, if possible). I suggest revising the whole first paragraph under Background.	Text revised. Revised as suggested.
Science Advisor	C-33	What mapping methodology will be used? What is the data source for this new vegetation map? This is important to know to be able to evaluate the success of this project. What is meant by fine-scale? Can you provide an estimate of what the resolution will be? What level of accuracy are you trying to obtain with this new map? What does it mean that the final product will comply with standards set forth by USNVC? Does this mean spatial standards or thematic standards or?	Text not revised. The mapping methodology has not been determined at this time. These details will be worked out as the project is further developed and will depend largely on the datasets available to us. Our goal is for this project to result in a map with a 30-meter resolution, or finer.
Science Advisor	C-33	If funding is prohibitive, it might be worthwhile to do this in a step-wise fashion, rather than do the whole thing at once. Habitats supporting sensitive plant species, highest value habitats, and areas of highest risk to degradation would be most worthwhile (areas getting more water now: playas, bajadas, better soils, may decline most with reduced or changed ppt.). High and dry sites may change little with increased heat or changes in ppt. Are there known good forage areas for tortoises? Are they at risk of weed spread or degradation with changes in ppt?	Text revised. We have considered a phased approach to this project. Added text to the Project Approach section to reflect this.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-33	Does this include both riparian and upland mapping? Completing the riparian mapping will still be quite an effort, requiring well-trained photo interpretation and considerable ground-truthing. In our last SAP meeting, I understood that this budget item was being cut, though the matrix at the end of this document keeps it in the budget. The majority of these comments assume that it has been cut.	Text not revised. This project would include mapping of both riparian and upland habitats. It was the fire risk project and the thermal refugia projects that were cut for budgetary reasons. The vegetation mapping project has not been cut from our proposed budget.
Science Advisor	C-33	What areas have changed the most? What was/is the resolution for the existing maps?	Text not revised. We have not completed an analysis to determine which areas have changed the most. The resolution of the current County Ecosystem Map is 30 meters.
Science Advisor	C-33	Are the botanists who will help with the vegetation mapping familiar with the USNVC and what alliances occur in Clark County? This knowledge will be important for the success of this project.	Text not revised. We have not hired botanists to complete this work yet. Training will be provided at the start of the project to ensure everyone involved understands the project methodology before field work begins.
Science Advisor	C-33	Not sure what this means. Are you using supervised or unsupervised classification for mapping? This may work well enough for large, homogeneous patches but are unhelpful in riparian areas or those with smaller, ambiguous, or disturbed patches. Mapping accuracy is considerably better with human interpretation, in general, but even more so in the patches mentioned above. Efforts via USGS or universities are very likely to use some version of computer modeling, and typically have very long delivery times. With the varied and fundamental uses planned for this finer scaled map, I would highly recommend using a skilled, private contractor for construction of the map and ground checking rather than either USGS or any academic/research organization.	Text not revised. The classification system for mapping will be determined when project methods are developed. Contractor selection will follow County procedures for procurement of professional services contracts. The firm that best meets our needs will be selected, regardless of whether they are a government/university institution or a private contractor.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
		AIS (Aerial Information Systems) and Stillwater Sciences are two organizations that are capable and experienced with this kind of work. Others certainly exist.	
Science Advisor	C-33	I think this project would benefit from have an adaptive management review with regards to the use of fine-scale mapping methods and applications. What models would be refined? Are the botanists who will help with the vegetation mapping familiar with the USNVC and what alliances occur in Clark County? This knowledge will be important for the success of this project.	Text not revised. Thank you for the comment. We will look into this when the project moves past the concept stage and we have a more complete idea of costs and the associated tasks.
Science Advisor	C-33	I suggest that this would also be useful for improving the accuracy of the Adaptive Management Review analysis of habitat loss and conservation by ecosystem type.	Text Revised. We agree that it would also be helpful for that as well.
Science Advisor	C-34	I think more detail needs to be provided regarding accuracy assessment if Budget Principle #6 is to be included.	Text revised. Details regarding accuracy assessment will be determined when the project is further developed. Removed budget principle #6.
Science Advisor	C-34	Finer resolution maps are critical for designing and implementing monitoring programs and informing the Adaptive Management Program.	Text not revised. Thank you for your support of this project.
Science Advisor	C-34	My understanding from our last SAP meeting was that the riparian mapping was going to proceed as the data gap is large, while upland maps exist and are in use, although with coarser resolution and unknown accuracy. This item was cut from the budget during our last SAP meeting.	Text not revised. This project has not been cut, nor has it been considered for elimination from this proposed budget. The commenter appears to have this confused with another discussion.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
U.S. Fish and Wildlife Service	C-41	The installation of permanent desert tortoise fencing along both sides of Route 159 could significantly reduce mortality and illegal capture of desert tortoises, encourage recolonization of habitat within close proximity to the road, adding hundreds of acres of available habitat for tortoises, and increase population viability by providing for connectivity of habitats across the road via drainage culverts. Other reptile and small mammal species may benefit from installation of desert tortoise fencing. As part of the monitoring proposed for this project, we plan to collect information about all species observed during road kill surveys conducted before and after installation of tortoise fencing so that we can assess the full benefit to tortoises and other species. The fencing is usually connected to culverts below the road surface, which provide connectivity for numerous species. We have been monitoring, with the use of motion sensitive cameras, several existing culverts along two other highways that are connected to existing tortoise fencing. In addition to preventing access to roads and limiting mortality, tortoise fencing is used to funnel animals toward culverts to ensure connectivity among habitats subdivided by roads. The data from our monitoring shows that tortoises, reptiles, small mammals, and invertebrates use these culverts for safe movement under roads, suggesting that installation of tortoise fencing along SR 159, with connection to culverts, may benefit multiple species in this ecologically sensitive area.	Text not revised. Thank you for your support of this project.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
NDOW	C-41	As with project 7, NDOW strongly supports efforts to assess effectiveness of desert tortoise translocations, with their potential use to augment depleted localized populations. This project has the potential to study key demographic parameters to assess translocation as a tool for population augmentation with lasting benefits toward species conservation.	Text not revised. Thank you for your support on this project. We believe it is Important information in determining the usefulness of translocation going forward
Science Advisor	C-41	This seems like a very valuable project. Do you also plan on attaching transmitters to the hatchlings?	Text not revised. Thank you for the comment. We have no plans to attach transmitters to the hatchlings at this time. It can be a labor intensive process changing out the transmitters on a regular basis and we do not have the budget for that at this time.
Science Advisor	C-42	Will the sample size of gravid resident and gravid translocated females be enough to address this project goal? What is the duration of this project?	Text not revised. The duration as budgeted is 1 year but that doesn't preclude us from doing the project again in the future. There is no way to answer the question of sample size until the season begins and we see how many females are gravid the year we decide to implement the study.
Science Advisor	C-43	The term 'health' always seems very ambiguous to me. Is there another term that would more specifically describe what you mean by predator and prey health?	Text not revised. Not that we are aware of but we would be open to ideas if you have any.
Science Advisor	C-43	I would like to see some evaluation of the methods of this project whether it is through adaptive management or not. What is the duration of this project? For the project objectives to be met a project longer than 2 years will be important.	Text not revised. The project is scheduled to last for 4 years. Two years were funded out of the 2017-2019 Biennium with the remainder funded out of this biennium.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-43	What does 'health status' mean specifically? What do you measure to determine health status? And what does data on health status tell you? If you are evaluating the presence of disease, then just state that rather than 'health status'. Each project objective is a study in itself!	Text not revised. Health status means any information regarding the animal's health which would include disease, condition, mortality rates and causes. It's a general term to describe anything they may find related to heath. This is not meant to be a scope of work or project plan just a general outline of what will occur under this project.
Science Advisor	C-44	Because of the broad project objectives and the cost, I would like to see more details regarding the project approach, to be able to evaluate whether the approach can successfully address all the objectives. Will the samples size of 36 jackrabbits and 10 coyotes be obtainable? What project objectives do the trail cameras address? Is this approach feasible for achieving any of the project objectives?	Text not revised. More detailed information can be made available upon request regarding this project.
Science Advisor	C-45	Field surveys are not one of the project objectives, yet the project approach describes plant surveys. Should field surveys of these plant species be included in the objectives?	Text not revised. The field surveys are being conducted under a separate project as described in the Background section of this Project Concept. Surveys are not an explicit objective of this project.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
NDF	C-46	I would like to see a component added to the project (maybe in the objective section), that specifically requires the recipient to research prior efforts for plant propagation and include a review of prior propagation work consulting literature and a good faith effort at contacting primary sources. I know that various entities Lake Mead NRA, UNLV, BLM, LV Springs Preserve, Susan Meyer, and some partnerships with NDF back in the mid 2000's have attempted to propagate LV bearpoppy and other threatened plant species. Some are better documented than others, and there has definitely been a range of techniques attempted varying in experimental quality. I'm sure few of those studies have been published or even recorded in a report format. There is quite a bit of data out there, but people/agencies/entities need to be approached and asked for it. Lit reviews are not enough because beyond USGS and UNLV, publishing is rare. So, I would like to ensure that we're learning from past work that has been done to more effectively advance.	Text revised. A new objective was added to the Project Objectives section as suggested.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-48	While I agree in concept that this should be studied, I think there are higher level questions that should be asked first, such as what plants are pollinator dependent; are they dominant, system defining species; what is their distribution, abundance, etc. Most vegetation critical to river restoration will be woody, perennial vegetation, which are less likely to be pollinator limited than annual or even perennial forbs. Dominant wet riparian species (willows, cottonwood, Phragmites, etc.) are wind pollinated and are inhibited more by changes in timing/quantity of river flows and seed dispersion than by seed production. Dry riparian species (i.e., acacia, mesquite) do require pollinators, but are long-lived, slower-growing species, decreasing impacts on restoration success. Riparian plants ARE important for pollinators, however. I would have an easier time supporting the project if it was focused on supporting pollinators, for pollinator's sake and for insectivorous birds. Making it in issue for the effectiveness of riparian restoration projects is a stretch for me.	Text not revised. This project was recommended by Science Advisors as described.
Science Advisor	C-48	Do you mean to identify potential important pollinator-plant interactions rather than important pollinator plants? If it is the latter, then I am not understanding what you mean by 'pollinator plants'? Can you re-word to be clearer?	Text not revised. This project is meant to focus on the former (i.e. important interactions which occur between plants and pollinators in the system). Therefore, the importance goes in both directions in this case - plants which are important for pollinators as well as pollinators that are important for plants - but the first step in the written project approach is to identify plants in the system which are potentially important to pollinators.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-49	Overall, this is a good project description, but more details about sample sizes and field study design under the 'Approach for manipulative study' would be helpful for evaluating the success of the project. Also, will the manipulative study be simultaneous with and in the same area as the inventory survey? If so, will it influence the results of the inventory survey?	Text not revised. The requested level of specificity has not yet been reached as this is still the Project Concept phase. More detail will be written into the project after the Project Concept has been accepted. Science Advisor recommendations concerning the specifics of methodology can be incorporated into the project at that time.
Science Advisor	C-49	Seems odd to have a rare, herbaceous, upland plant as an example here (I've never encountered a rare species in a riparian zone....competition and/or disturbance regimes are too intense. Are there any pollinator reliant species known from riparian zones?	Text not revised. Unknown. This text was written by Scott Abella of UNLV, and I'm sure he used bearpoppy as an example simply because it is well known and exemplifies the high level of importance pollinators can have for many plant species.
Science Advisor	C-51	The project objectives state that the success of 2 kinds of herbicides will be compared over at least 1 year, but in the project approach, it states that plots will be assessed for 2 consecutive summers. Would it be clearer to say 'at least 2 years' in the project objectives?	Text revised. The recommended change was made.
NDOW	C-53	NDOW strongly supports this project, as the project builds largely from previous and ongoing NDOW Gila monster telemetry projects and genetic samples collected by NDOW biologists and cooperators over many years. The results of this study should contribute greatly to what is understood about this understudied species, and will hopefully contribute toward future conservation of this rare species under various scenarios of urban and industrial development and climate change. Under 'Project Approach' (page C-54), wording should be changed to indicate "Collaborators will include personnel from Nevada Department of Wildlife ... "	Text revised. The recommended change was made.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	C-54	Interesting project, but more details on the project approach would be helpful for evaluating the success of the project. For example, what spatial data layers are needed to be able to model the distribution of Gila monsters?	Text not revised. The requested level of specificity has not yet been reached as this is still the Project Concept phase. More detail will be written into the project after the Project Concept has been accepted.
Science Advisor	E-4	It seems that some of what is already happening could well be called 'baseline inventories' (vegetation mapping, ecosystem/species habitat suitability models, population measurements, etc.) and long-term monitoring can be as simple as a series of high quality photographs. This item may warrant a closer look to see what may already be in use and what protocols may already exist in similar areas (no need to re-create the wheel). A fundamental piece of adaptive management is deliberate and focused monitoring on ecosystem features undergoing change (intended or not), that then informs future actions. I know much of this is happening, just maybe not in an organized strategy. Examples from SAP would be good, as well as identification/incorporation of what is already being done.	Text not revised. We agree that a closer look is warranted and would like to work on this to see what would be necessary to potentially include it in the next biennium if funding is necessary, or incorporate it into the program if funding is not necessary.
Science Advisor	E-5	Much of the baseline and ongoing projects would easily satisfy large parts of a comprehensive monitoring program (ditto: upland monitoring). What is missing is a comprehensive protocol that 'houses' the pieces. Various protocols are in use by many organizations and would likely be easily modified for Desert Conservation Program purposes.	Text not revised. We agree that a closer look is warranted and would like to work on this to see what would be necessary to potentially include it in the next biennium if funding is necessary, or incorporate it into the program if funding is not necessary.
U.S. Fish and Wildlife Service	E-6	Which project was this in the 2017-2019 biennium? for LIDAR surveys?	Text not revised. Funding for LiDAR acquisition was included under the Adaptive Management Program budget (Project Concept 2, Page C-5) in the 2017-2019 Implementation Plan and Budget.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	E-6	Glad this is still in the budget as it is fundamental to much of what the Desert Conservation Program aims to accomplish in riparian areas. Riparian mapping that I have found for the Virgin and Muddy Rivers (UNV, Stillwater, TNC) has been either too coarse, not field verified, or too old to be functional for current projects and purposes, especially considering impacts from the tamarisk beetle. LiDAR plus color images (NAIP's is likely adequate) will also help understand what vegetation is possible where it is currently absent. For mapping accuracy, I strongly recommend human interpretation mapping, and not supervised or unsupervised classification, as error rates are simply too high for anything beyond broad assessment purposes. For time considerations, I strongly recommend a private entity for mapping rather than USGS or any university/research only organization. Their delivery times are simply too long and quality often suffers. Mapping fine-scale, small patch, often-disturbed riparian areas is difficult and will require specialized skills for interpretation and field checking both before and after mapping.	Text not revised. Thank you for your support of this project. Contractor selection will follow County policies. The firm that best meets our needs will be selected, regardless of whether they are a government/university institution or a private contractor.
Science Advisor	E-6	Could this validation information also be used for long-term desert habitat monitoring purposes? I'm thinking high resolution photographs of random places might serve quite well.	Text not revised. That is a good suggestion and we will keep this in mind as the project moves forward.

COMMENTER	PAGE	COMMENT	DESERT CONSERVATION PROGRAM RESPONSE
Science Advisor	General	Just wondering why, the qualification of the term 'baseline' to many of the project descriptions? Does this infer that these projects are only short-term because they are gathering only baseline data? Or is it to distinguish between gathering baseline data now and continuing to gather data later that could inform an adaptive management process?	Text revised. Removed "baseline" from project concept titles.
Science Advisor	General	Is there a glossary to define "structured decision making approach'? It is not obvious from the context of what that is to the layperson. Other terms like 'effectiveness monitoring" might also benefit from glossary.	Text revised. Added definitions of these terms in the footnotes.

ATTACHMENT G

Fund Balance Projection

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FUND BALANCE PROJECTION	PRIOR YEAR ENDING 6/30/2017	PRIOR YEAR ENDING 6/30/2018	CURRENT YEAR ENDING 6/30/2019	FUTURE YEAR ENDING 6/30/2020	FUTURE YEAR ENDING 6/30/2021	FUTURE YEAR ENDING 6/30/2022	FUTURE YEAR ENDING 6/30/2023	FUTURE YEAR ENDING 6/30/2024	FUTURE YEAR ENDING 6/30/2025	FUTURE YEAR ENDING 6/30/2026	FUTURE YEAR ENDING 6/30/2027	FUTURE YEAR ENDING 6/30/2028	FUTURE YEAR ENDING 6/30/2029	FUTURE YEAR ENDING 6/30/2030
Beginning Fund Balance	$55,114,232	$52,816,233	$48,025,515	$31,379,913	$30,986,529	$30,464,983	$28,522,701	$26,550,452	$23,222,435	$19,758,767	$16,146,030	$12,378,310	$8,448,988	$4,290,198
REVENUE														
Disturbance Fee Revenue	$1,664,368	$1,679,931	$1,705,000	$2,472,250	$2,601,500	$2,741,750	$2,884,750	$3,038,750	$3,201,000	$3,363,250	$3,533,750	$3,712,500	$3,839,000	$4,088,150
Interlocal Cooperative Agreements (SNPLMA)	$484,577	$310,318	$1,818,788	$1,175,000	$1,275,000	$1,375,000	$1,475,000	$250,000	$262,500	$275,625	$289,406	$303,876	$319,070	$335,024
Interest Earnings	$(1,743)	$190,305	$247,812	$1,279,163	$1,279,163	$287,211	$269,498	$251,535	$220,068	$187,299	$153,096	$117,400	$80,147	$40,661
Other	$1,696													
Subtotal Revenues	$2,148,898	$2,180,554	$3,771,600	$4,926,413	$5,155,663	$4,403,961	$4,629,248	$3,540,285	$3,683,568	$3,826,174	$3,976,252	$4,133,776	$4,238,217	$4,463,835
Total Available Resources (Fund Balance plus Revenues)	$57,263,130	$54,996,787	$51,797,115	$36,306,326	$36,142,192	$34,868,944	$33,151,949	$30,090,737	$26,906,003	$23,584,941	$20,122,282	$16,512,086	$12,687,205	$8,754,033
EXPENDITURES														
Salaries & Wages	$866,915	$879,164	$1,216,503	$1,289,493	$1,366,863	$1,448,875	$1,535,807	$1,627,956	$1,725,633	$1,829,171	$1,938,921	$2,055,257	$2,178,572	$2,309,286
Employee Benefits	$401,519	$567,519	$598,958	$634,895	$672,989	$713,368	$756,170	$801,541	$849,633	$900,611	$954,648	$1,011,927	$1,072,642	$1,137,001
Services & Supplies	$3,072,649	$3,972,822	$18,601,741	$3,395,409	$3,637,357	$4,184,000	$4,309,520	$4,438,806	$4,571,970	$4,709,129	$4,850,403	$4,995,915	$5,145,792	$5,307,746
Capital Outlay	$105,814	$1,551,767												
Subtotal Expenditures	$4,446,897	$6,971,272	$20,417,202	$5,319,797	$5,677,209	$6,346,243	$6,601,498	$6,868,302	$7,147,236	$7,438,911	$7,743,972	$8,063,098	$8,397,006	$8,754,033
ENDING FUND BALANCE (RESOURCES LESS EXPENDITURES)	**$52,816,233**	**$48,025,515**	**$31,379,913**	**$30,986,529**	**$30,464,983**	**$28,522,701**	**$26,550,452**	**$23,222,435**	**$19,758,767**	**$16,146,030**	**$12,378,310**	**$8,448,988**	**$4,290,198**	**$0**