

Final Project Report for Clark County Culvert Inspection for the Purposes of Desert Tortoise Passage Clark County, Nevada



Prepared For:
Clark County Desert Conservation Program



desert conservation
PROGRAM

500 South Grand Central Parkway / 1st Floor
Las Vegas, NV 89155

Prepared by:

NewFields

8250 West Charleston Boulevard, Suite 100
Las Vegas, Nevada 89117

June 2021

This work was supported by the Clark County Desert Conservation Program and funded by Southern Nevada Public Land Management Act as project 2015-QUOTE-1580F, to further implement or develop the Clark County Multiple Species Habitat Conservation Plan.

Contents

<u>Section</u>	<u>Page</u>
1.0 Executive Summary.....	2
2.0 Introduction	2
2.1 Description of the Project.....	2
2.2 Background and Need for the Project	4
2.3 Management Actions Addressed.....	4
2.4 Goals and Objectives of the Project.....	4
3.0 Methods and Materials.....	5
3.1 Protocol and Scoring.....	5
3.2 Field Methodology	5
4.0 Results.....	6
4.1 Objectives Completed:.....	6
4.2 Numerical Results	6
4.3 Spatial Results Representations.....	6
5.0 Conclusion.....	8
6.0 Recommendations	8
7.0 Literature Cited	8

Table

Table 1 Data Collected During the 2014 Field Season	6
---	---

Figures

Figure 1 Project Location.....	3
Figure 2 Datapoints with Passability Scores of 1 or 2.....	7

1.0 Executive Summary

The vast highway system of Clark County has historically posed a danger to the regional desert tortoise population. While much has been done to mitigate the issues of mortality, the Desert Conservation Program (DCP) has recognized the impediments roadways pose to genetic diversity and general tortoise movement patterns. This year the DCP has contracted the services of NewFields to comprehensively evaluate the culverts beneath the highways in Clark County that could theoretically be used by desert tortoise. The data gathered by NewFields will be effective in mapping the existing passageways for tortoise and help future planning for improving the existing infrastructure to facilitate more usable corridors in the most efficient and strategic manner possible.

2.0 Introduction

2.1 Description of the Project

Observations were made of the known culverts underneath the highways of Clark County. Each end was evaluated independently, resulting in over 1700 data points in desert tortoise habitat. The relevant highways included the Interstate 15, US Highway 95, US Highway 93, State Highway 160, State Highway 161, State Highway 164, State Highway 165, and the new Interstate 11. While attempts were made to access data points from alternative points of egress, the remote nature of most areas dictated that most culverts be accessed directly from the highway.

2.2 Background and Need for the Project

Some of the negative impacts of roadways through the desert are obvious. The introduction of invasive species, destruction of habitat, and increased mortality all readily come to mind. While work has been done on behalf of the desert tortoise to mitigate these issues, namely through the use of exclusionary fencing along highways, this has also brought about other complications. Highways and the associated fencing have created impermeable barriers across historically open range. This leads to isolation of populations with limited genetic mixing. This also inhibits the desert tortoise's natural behavior, which could include walking over a half a mile a day.

The Desert Conservation Program has recognized the dangers posed herein and is pursuing the solution of using the existing culverts as wildlife corridors.

2.3 Management Actions Addressed

This project addresses the stated goals of the Multiple Species Habitat Conservation Program, specifically not fragmenting the habitat of the protected desert tortoise.

2.4 Goals and Objectives of the Project

The overarching goal of this project was to provide a comprehensive data set for the DCP to evaluate the current state of the culverts in Clark County, as well as have the information necessary for future planning, as it relates to the desert tortoise and its ability to use the culverts.

The objectives to meet the goals included:

1. Have a qualified biologist visit and verify each culvert in person.
2. Evaluate each end of every culvert to identify those which are currently usable by tortoise.
3. For those culverts not currently usable, approximate the inputs needed to make them usable by desert tortoise.
4. Record the location, data, and biologist recommendations.
5. Effectively report findings to the DCP.

3.0 Methods and Materials

3.1 Protocol and Scoring

Before heading into the field, a straightforward and efficient protocol was devised for NewFields biologists to follow. The protocol was based on the stated goals of the project, and software tailored to expedite the gathering and reporting of data, all of which was conferred, confirmed, and reaffirmed by DCP staff.

- The provided database of culverts was reviewed and converted to usable data by field biologists.
- A scoring rubric was created to distinguish the usability of each culvert by desert tortoise.
- A data gathering application, Fulcrum, was employed to display the known information and location of each culvert, as well as facilitate inputting the newly gathered data.
- The protocol was used, evaluated, and refined by NewFields to ensure practicality.
- A NewFields biologist met with a representative of the DCP, Scott Cambrin, in the field to demonstrate the protocol, and ensure that the goals of the DCP were being met by the project.

3.2 Field Methodology

Each culvert was visited in person by a biologist. The biologist was chosen for their familiarity with the habits and capabilities of the desert tortoise, and therefore would be best suited for applying the rubric of usability for each datapoint.

- Biologists were outfitted with safety equipment, including high visibility vests and flashing lights for their vehicles.
- High precision GPS units were employed to ensure accuracy in finding known culverts and recording the locations of previously unknown culverts.
- Both ends of each culvert were evaluated as separate data points.
- If a culvert system was divided in the median of the highway, each end of each culvert was evaluated individually, usually resulting in 4 datapoints.
- Multiple culverts in the same location were evaluated as a single culvert. For instance, if a concrete tunnel had 3 parallel passageways, they would be evaluated as a single datapoint and given the grade of the most usable of the 3.
- Whether or not existing tortoise fence was tied into the culvert was noted at each datapoint.
- For datapoints not considered immediately usable, suggestions were made to indicate the level of improvement needed to make it usable.

- A photo was taken of each datapoint with an attempt to visually display the improvements needed to increase usability.
- All data was reviewed and revised for consistency, completeness, and quality control

4.0 Results

The project was a success in terms of gathering data for future planning. Essentially every datapoint was accessible, the provided database of known culverts proved to be very accurate, and over 99% of culverts were located. By following the protocol and using the scoring rubric, the gathered data has created a very simple, yet thorough, picture of the current state of the culverts in Clark County, as they relate to tortoise usability. Simple examples of filtered data are provided in Table 4 to illustrate the types of information that could quickly be garnered from the dataset. Paired with the corresponding maps, this should prove to be a useful tool.

4.1 Objectives Completed:

To complete the central objective of:

Visiting and evaluating the culverts of Clark County in regard to tortoise usability, the following was accomplished:

1. Collected observed data in accordance with the protocol in a safe and effective manner.
2. Completed effective quality control on recorded data.
3. Effectively reported findings to the DCP.

4.2 Numerical Results

Table 1 outlines examples of the data collected by data type and value.

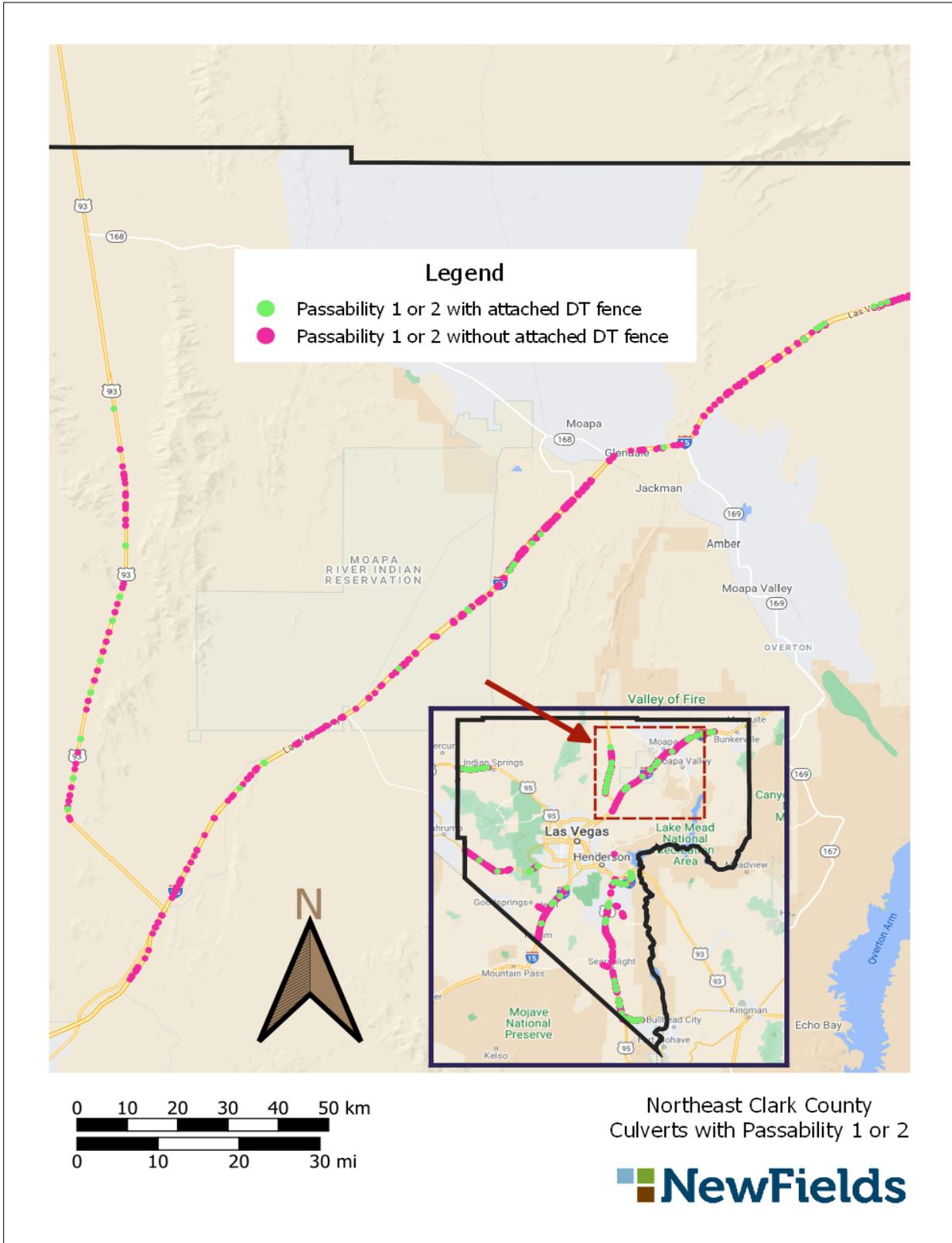
Table 1 Data Collected During the 2014 Field Season

Data Type Collected	Numerical Value
Total datapoints	1770
Grade 1 (Easily Passable)	1067
Grade 2 (Passable with light effort)	199
Grade 3 (Passable to some tortoise)	170
Grade 4 (Would require some intervention)	143
Grade 5 (Would require major improvement)	191
Grade 1 or 2 with Attached Tortoise Fence	155

4.3 Spatial Results Representations

Figure 2 gives a visual representation of the filterable data now available. In Figure 2, the data is filtered for culverts given a Passability Score of 1 or 2. These results have then been divided into those with attached desert tortoise fence, and those without. This map shows gives one example of how an area can quickly be assessed for how the currently usable culverts (those with attached DT fence) are distributed. Where the gaps in passability lie are apparent, as are the culverts most easily upgraded (culverts with a score of 1 or 2, but without attached DT fence).

Figure 2 Datapoints with Passability Scores of 1 or 2



5.0 Conclusion

The project was a successful exercise in data collection. The provided dataset of known culverts was very accurate, the agreed upon protocol was thorough yet simple, and the collected data was complete and accurate. With the collected data, and corresponding photos, the DCP should be well equipped for making informed decisions going forward.

6.0 Recommendations

There is not much room for improvement with the current protocol and scoring rubric. As the DCP identifies gaps in the passable culverts available to desert tortoise, they will likely be tasked with improving some of the culverts. We advise having a few solutions in mind before starting those improvements, with the intention of long-term, efficient, options that consider weathering, erosion, usability by the animal, and ease of install. Some culverts seem like they might require ramps. Concrete may be the best solution for durability, and usability by tortoise, but possibly be more expensive and difficult to install. A metal ramp may be cheaper, and easier to install, but perhaps would be too hot in the sun to be used by reptiles without covering or painting. Natural fill would be the most usable by tortoise and typically easy to install, but also the most susceptible to erosion, the typical cause of impassability for many of these culverts.

7.0 Literature Cited

Clark County. 2000. Final 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. September 2000.