

Agency/Organization: Hardshell Labs, Inc.

Project Name: Subsidized Predator Management at the BCCE

Project Number: 2013-BOARMAN-1421B

Reporting Period: April – June 2024

Project Contact Name and Information: Jed Arnold, Desert Conservation Program

**QUESTION 1: What did you accomplish during this reporting period?
How did these accomplishments help you reach the goal of your project?
If relevant, what indicators or benchmarks were used to determine your progress?**

Accomplishments and Progress Toward Reaching Goals:

1. Conducted three days of field work in May and three in June, which involved 10 full rounds of raven surveys, checking status of raven nests, and setting up and checking one PATS unit.
2. Laser systems (laser, solar panels and charging system, camera, and satellite-based communication device) were installed and made operational at both the landfill and sewage ponds (D03).
3. Entered, managed, and conducted cursory analyses of the data (partial attainment of D05).

An average of 47.3 (sd = 40.56, range = 13 – 192) ravens were observed per survey cycle, with the highest count occurring in the late afternoon of 21 June. The active face of the landfill almost always had the highest numbers (mean = 20.4, sd = 16.53, range 3 – 71). The sewage treatment facility usually had the second highest numbers of ravens (mean = 6.6, sd = 6.56, range = 0 – 21), with the highest being the afternoon of 23 June. Figure 1 contains the mean number of ravens observed at point counts and road surveys conducted in January, March, May, and June, and demonstrates a major shift in raven abundance from the open desert areas with the Boulder City Conservation Easement (BCCE) in winter and spring to larger concentrations in the summer at the landfill and sewage ponds where there is an abundance of food and water.

We located 21 raptor nests within the study area (Boulder City, BCCE+5 mi boundary). All but one were on high-tension power towers; the only non-tower nest was on a railroad trestle at the junction of Hwy 95 and Boulder City Pkwy. Twelve nests were active Common Raven Nests, three were active Red-tailed Hawk Nests, and seven appeared to be inactive this year.

The one PATS unit in place and active for seven weeks, 3 May – 21 Jun, was approached and explored twice by kit foxes but never by ravens or coyotes.

4. A contract modification request was written and submitted to accommodate shifting the start of egg oiling to 2025.

QUESTION 2: What, if any, problems were encountered? Briefly describe those problems and the manner in which they were dealt.

1. Preparation of the ROAM™ Lasers was delayed this year in part due to the lateness of the contract award and in part due to unanticipated technical difficulties with the units that were produced. The lasers were installed and operable by the end of April. However, they continue to shut down and fail to reset on their own. We suspect the problem is with the intense heat during the recent heat waves exposing the lasers to higher ambient temperatures than they have experienced previously and were designed to withstand. The lasers are being completely redesigned and rebuilt and are expected to be ready for successful deployment in September 2024. The delay is fortuitous because it affords us the opportunity to collect more pre-treatment baseline data than originally planned on raven numbers before the lasers become active on a regular basis. With the anticipated approval of the contract modification, we will be able to continue use of the laser beyond the originally planned cessation of their use.
2. The field worker (WIB) on the project suffered a serious non-project related head injury followed by hospitalization and a six-week long recovery. This delayed the installation of the TTs and all but one PATS. Their installation was further prevented by the intensely hot weather in mid-June. Summer is not a good time to deploy these because ravens spend very little time in natural habitats and tortoises are inactive. In the fall, ravens spend more time in tortoise habitat and tortoises themselves are more active. Hence, we will wait until late September to deploy the TTs and PATS. Furthermore, the time lost by not deploying them this spring will be compensated for by extending the contract end date by six months per the contract modification requested in June.

QUESTION 3: What, if any, proposed activities were not completed? Briefly describe those activities, the reasons they were not completed and your plans for carrying them out.

See items 1 and 2 in the previous section.

QUESTION 4: What is the calculated percent of work completed?

We estimate we have completed approximately 22% of the project (5/23 project months)

**QUESTION 5: Do you foresee any upcoming problems with future project activities?
If so, how do you propose to overcome those problems?**

There should be no problem deploying the PATS and TTs in the Fall. While we anticipate that our laser problems will be solved we will compensate for any continued problems with them by using an onsite operator wielding a handheld laser.

QUESTION 6: Is there anything else you want to tell the DCP about this project?

None at this time.

QUESTION 7: What was produced during the reporting period?

1. This Quarterly Report (D07)
2. The Data Deliverable (D08) for this quarter is being prepared and will be submitted very soon.
3. Contract modification request was submitted to account for the inability to conduct egg oiling this year.

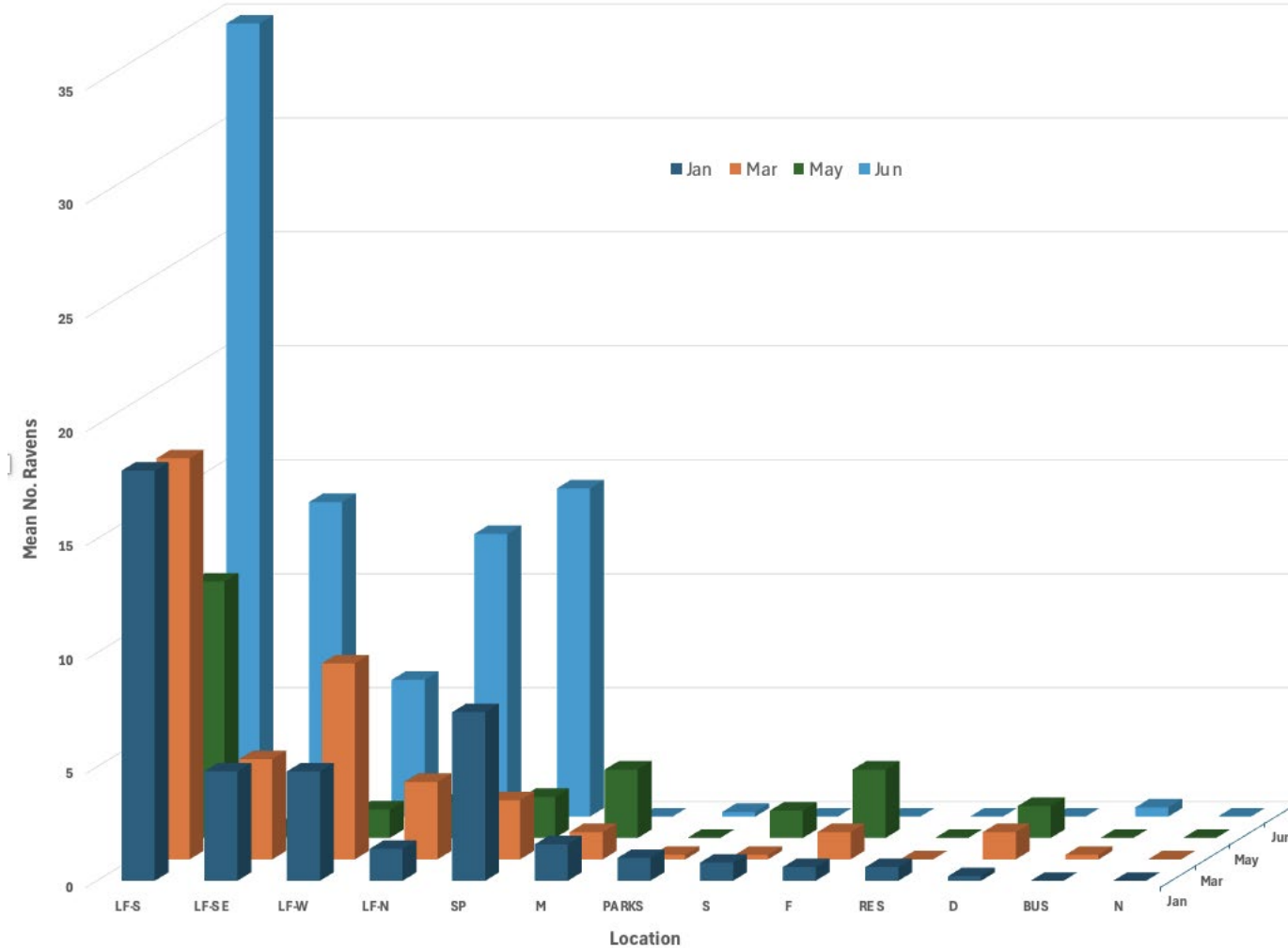


Figure 1. Distribution of numbers of ravens counted on point counts and road surveys in January (dark blue), March (orange), May (green), and June (light blue) of 2024. Locations LF-S, LF-SE, LF-W, and LF-N are from point counts at the Boulder City landfill; SP is from point counts at the Boulder City wastewater treatment facility; PARKS (parks, gold course and school), RES (residential area), and BUS (commercial businesses) are from routes driven within Boulder City; and M, S, F, D, and N are from routes driven within the Boulder City Conservation Easement.