

**Agency/Organization: U.S. Geological Survey, NOROCK**

**Project Name: Distribution and Threats to the Arizona Toad in Clark County**

**Project Number: 2023-USGS-2345A**

**Reporting Period: October 1, 2024 – December 31, 2024**

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## **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?**

During this reporting period, we completed several project milestones including our annual project data deliverable (D08) and submitting our first annual project report (D09). We have expanded on preliminary data QAQC and summarizing by further processing and mapping results and have initiated work on a habitat suitability map for the Arizona Toad. We received results from eDNA filter analysis in late November and have incorporated those results into our data summaries and maps to share with project partners.

We have finished measuring photographs of 87 toads taken in the field to obtain a reliable measure of parotoid gland size. This metric has been used to identify potential hybrids between Arizona and Woodhouse's Toads, and we have processed measurement data for animals captured in 2024. Results indicate that both gland size and morphological hybrid score data for our study area is consistent with previously reported values elsewhere in the Arizona toad's range, and that these are reliable methods for detecting hybrids. We encountered several suspected hybrids during 2024 field surveys, and many of those individuals scored as potential hybrids using both metrics.

We have created a preliminary species distribution model using a MAXENT framework for Arizona Toads in the study region. This has required compiling and cleaning occurrence records from museum collections, agency databases, and other surveys. We have also aggregated, formatted, and projected environmental predictor data from a variety of sources for use in the model. Environmental predictors include terrain ruggedness index, several measures of stream discharge and condition, riparian canopy cover, annual evapotranspiration, and invasive species presence. While the current model is preliminary, we have created a functioning workflow to easily incorporate new records in 2025. Remaining steps include incorporating additional records after 2025 field surveys and fine-tuning the model to best fit occurrence data.

## **QUESTION 2:**

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

We did not encounter any significant problems in this reporting period. eDNA filter results were returned to us ahead of schedule and with no results that were unexpected or appear to be in error. The eDNA primers used for analysis accurately detected the species at sites where we knew them to occur, as well as at sites where we did not detect species during visual encounter surveys. We were able to use eDNA results to confirm the identity of tadpole specimens and hope to use this information to better inform tadpole identification in 2025. Compiling occurrence records for use in the habitat suitability model continues to be a lengthy process, and we continue to track down photos and specimens from museum collections to confirm suspect records. We are working with regional species experts at the Arizona Game & Fish Department to confirm records, which so far have been left out of the preliminary species distribution model.

### **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.**

All proposed activities for this reporting period have been completed. All 2024 field data has now been processed, cleaned, compiled, and submitted to DCP, including eDNA filter results.

### **QUESTION 4:**

**What is the calculated percent of work completed?**

We have completed surveys at 80 out of the proposed 100 sites for the 2-year project, or 80%. We planned to conduct surveys at ~50 sites in 2025 and exceeded that goal. We estimate that 75% of the work required to produce a habitat suitability map for Arizona Toads in the study area has been completed.

### **QUESTION 5:**

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

We do not foresee any problems with future project activities. Possible delays exist when hiring a field technician to aid with 2025 surveys; therefore, we are already identifying potential candidates to start required hiring paperwork and avoid delays. In 2025, we will use eDNA filter results from 2024 sampling to inform additional site selection, will put additional emphasis on nocturnal surveys to confirm species ID, and will target areas in the study area that have not yet been visited or for which permissions were not obtained in 2024. We plan to begin applying for and renewing any needed permits for the 2025 in the next quarter to ensure adequate processing time.

### **QUESTION 6:**

**Is there anything else you want to tell the DCP about this project?**

- We have detected Arizona Toads in Clark County! Using eDNA methods, we collected 2 filters that tested positive for Arizona Toad DNA. These filters were collected at the Clark County Riparian Reserve, at Bunkerville East. We plan to focus additional survey efforts at nearby sites along the Virgin River in eastern Clark County in 2025.

**QUESTION 7:**

**What was produced during the reporting period?**

During this reporting period, we have completed/submitted:

- D07 (Quarterly Progress Report) - Submitted to DCP September 20, 2024
- D08 (Annual Project Data) - Submitted to DCP December 3, 2024
- D09 (Annual Project Report) - Submitted to DCP December 3, 2024