

# The Impact of the Invasive American Bullfrog (*Lithobates catesbeianus*) on Woodhouse Toad (*Anaxyrus woodhousii*) Demographics in the Rio Mora Wildlife Refuge in Northeastern NM

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## ABSTRACT

The introduction of bullfrogs (*Lithobates catesbeianus*) has a negative impact on native species by out competing them for food and habitat. Woodhouse toads (*Anaxyrus woodhousii*) are among the native species to the Rio Mora National Wildlife Refuge (RMNWR) that co-exists with Bullfrogs. Early on bullfrogs were eradicated from a 2,600 meter section of the Mora River to evaluate the impact of their eradication on the local fauna while a control site of the river was left untouched where bullfrog density did not change. A parallel study on the diet of the euthanized bullfrogs found the presence of Woodhouse toads in their diet. The goal of this project is to investigate the impact of bullfrogs on Woodhouse toads by using three methods to determine differences between the control and experimental sites: (1) Determine abundance via two methods: A) a mark-recapture study demographic parameters (rate of increase, survival, capture rate). Distance sampling using random or systematic transects in the study area; (2) comparison of demographic structure using the animals caught in both sites; and (3) radio telemetry to explore habitat use and mobility of the Woodhouse toad as well as how it is affected by the presence of Bullfrogs.

## HYPOTHESIS

We hypothesize that the bullfrog has an impact on Woodhouse toad population abundance that will show an increase in the experimental site compared to the control site.

## OBJECTIVES

- Determine relative population abundance of the Woodhouse toad.
- Compare demographic structure between the two sites.
- Determine Woodhouse toad distribution within the Rio Mora Wildlife Refuge.

## BULLFROGS AS INVASIVE SPECIES

- The Bullfrog is an invasive species in numerous parts of North America that lack natural predators.
- The introduction of bullfrogs has a negative effect on native species by increasing competition for habitat, resources and predation pressure.
- This study will provide more information on the impacts of introducing invasive species to northeastern New Mexico ecosystems.
- Carry and spread pathogens to native amphibians.
- Feed on a large range of prey.
- Consume native amphibians in different age groups such as tadpoles, juveniles, and adults.

## WOODHOUSE TOAD

- Endemic species to the U.S. and parts of Mexico.
- Many species of toads including the Woodhouse are nocturnal species that become active in the late evenings to prey on insects.
- The Woodhouse toad is a greenish tan color with dry warty skin and a distinct white stripe located on the middorsal.

## STUDY SITE



Figure 1: Aerial view of the Mora River at Rio Mora National Wildlife Refuge.

## BULLFROG DIET

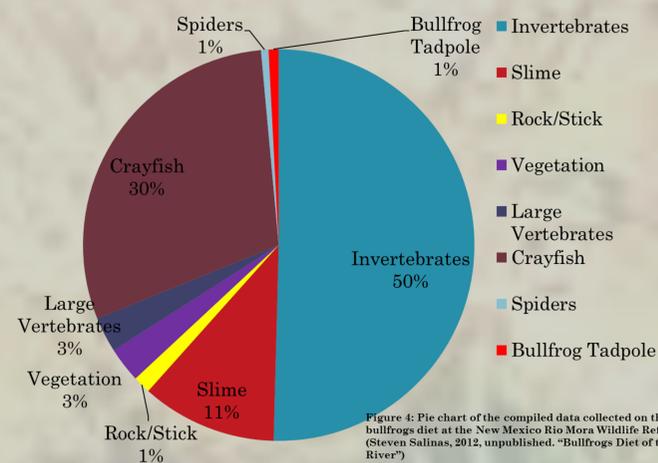


Figure 4: Pie chart of the compiled data collected on the bullfrogs diet at the New Mexico Rio Mora Wildlife Refuge (Steven Salinas, 2012, unpublished. "Bullfrogs Diet of the Mora River")

## METHODS

### Distance Sampling

- 10 parallel line transects will be randomly located in each of the control and experimental sites.
- Three observers will capture Woodhouse toads along each transect to obtain measurements to determine an approximate toad population size.

### Call Surveying

- Call surveys will be done at night based on breeding season.
- Toads that send out alarm calls will be collected.

### Mark-Recapture



- Individuals will be implanted with PIT tags.
- Line transects and call surveying will be done several times to capture more toads.
- Number of marked individuals will be counted and mark-recapture formula can be calculated.

### Radio Telemetry



- 8 individuals will be equipped with radio transmitter belts.
- 4 individuals will be released in each site to compare distribution patterns.
- The toads will be tracked weekly.

## ANTICIPATED RESULTS

- We expect to see an increase in toad abundance in the experiential site due to lower density of bullfrogs.
- It is probable to see a difference in demographic structure between the two sites.
- We hope to declare Woodhouse toads' home range as well as how distribution is affected by the presence of Bullfrogs.

## SIGNIFICANCE

- This study will provide more information on the impacts of introducing invasive species to northeastern New Mexico ecosystems.
- Come up with techniques to eradicate the Bullfrog before they cause an imbalance ecosystem.
- Woodhouse toads may be important to keep an ecosystem healthy in the refuge.
- With the local aquatic wildlife being reduces due to the invasive bullfrogs the information gathered can give some future directions to find ways to protect the Woodhouse toad from bullfrog predation.
- There are very few studies on Woodhouse Toads in the southwestern states and this study can contribute more information about their demographics, behavior, and population size in northeast NM.
- It is known that Woodhouse Toads are more prone in getting the chytrid fungus compared to other native amphibians in NM.