People and Frogs: Working Towards Common Ground

Emily A. Price1,3, Mark W. Brunson1, and Karen H. Beard2
1Department of Environment and Society and the Ecology Center, Utah State University, Logan, UT 84322-5215
2Department of Wildland Resources and the Ecology Center, Utah State University, Logan, UT 84322-5230
3Corresponding author: Emily.Price@usu.edu

Introduction
Invasive species, such as the frog *Eleutherodactylus coqui*, have the potential to affect human health, biodiversity, and economies (Mooney 2005). Many invasive species are first introduced as an unintended consequence of human activities. Once established, the actions of local people can have considerable influence on the spread, control, and prevention of invasions.

For this reason, communities should focus on the most cost-effective management strategies possible. These strategies may include increased reliance on the public to take actions to reduce invasive species impacts. Research on invasive species that extends beyond the normal focus on the importance of phases (Lockwood et al. 2007) is necessary to affect human health, biodiversity, and economies.

Research Questions
1. What do Hawaiian residents know about the coqui frog and invasive species in general?
2. How is the residents' level of knowledge and attitudes about coqui frog ecology and impacts related to their behaviors toward coqui frogs on their properties?
3. What type of information might be incorporated into campaigns or education programs to increase their positive impacts?

Success After Introduction

Fig. 1. Humans play a role in the success of introduced species at each of the important phases (Lockwood et al. 2007).

Fig. 2. After introduction, a number of factors contribute to the success of the invader. Often the “Local People’s Characteristics” sphere is overlooked in research.

Hypothesis and Prediction

**Patterns of dispersal and spread of *Eleutherodactylus coqui* are linked to:**
- human behavior
- attitudes
- knowledge

Due to the potential maintenance of refugia and prey availability for the coqui.

Therefore (see Fig. 3 for graphic depictions):
- Positive attitude towards the coqui equals positive land management for the coqui, which equals more coqui near their property
- Negative attitude equals negative land management, which equals less coqui
- Neutral attitude equals either negative or positive land management, which equals more or less coqui (depending upon management)

Study Species

**Eleutherodactylus coqui**: referred to as the coqui frog
- Native to Puerto Rico
- Introduced to Hawaiian Islands in the late 1980s (Kraus & Campbell 2002; Kraus et al. 1999)
- Call as loud as 90dB at 0.5m (Beard & Pitt 2005)
- Population densities up to 2 or 3 times greater in Hawaii than native Puerto Rico (Beard & Pitt 2005)

Unique Social Qualities of the Coqui
A number of factors make the coqui interesting from a social perspective:
- Popular status in native Puerto Rico
- Many amphibians in the world are declining in number
- Hawaiians mostly concerned with noise nuisance
- Difference in attitudes towards the coqui

Mixed-Methods Approach

**Qualitative:**
A. Semi-structured interviews of residents of Hawaii, Kauai, Maui, and Oahu:
1. Questions will focus on:
   - Beliefs and attitudes regarding coqui specifically
   - Beliefs and attitudes on invasive species in general
   - Current outreach methods

**Quantitative:**
A. Mail surveys of residents of Hawaii, Kauai, Maui, and Oahu:
1. Questions will focus on:
   - Knowledge, attitudes, and behavioral choices towards the coqui

B. Frog surveys:
   - Assess presence/absence and abundance of frogs near interviewee's property
   - Assess plant species, understory density, and other habitat features

Linking Social Science with Invasion Ecology
- Coupling studies of human and natural systems allows for understanding not possible when studied separately (Liu et al. 2007)
- Knowledge gained from social science research could be used by invasion ecologists to:
  - Improve predictive models
  - Allow inclusion of human characteristics
  - Improve understanding of barriers to introduced species' success
  - Discover more effective management strategies

Management Implications
A. People can be part of the problem *and* the solution
B. The message conveyed about the coqui will impact success of human contribution
C. There may be a reduction in control expenditures with more targeted programs and people's support
D. Effective management requires knowledge of biological and social aspects surrounding the invader (Ellis & Elphick 2007)

Poster presented at the First International Conference on the Coqui Frog, Feb 7-9, 2006, Hilo, HI