Project Title:	Landscape and climatic risk factors for *Toxoplasma gondii* infection risk in Kauai, Hawaii
Project Period:	January –December 2016
Sponsor:	Hawaii Invasive Species Council
Award:	$23,616
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Research Abstract

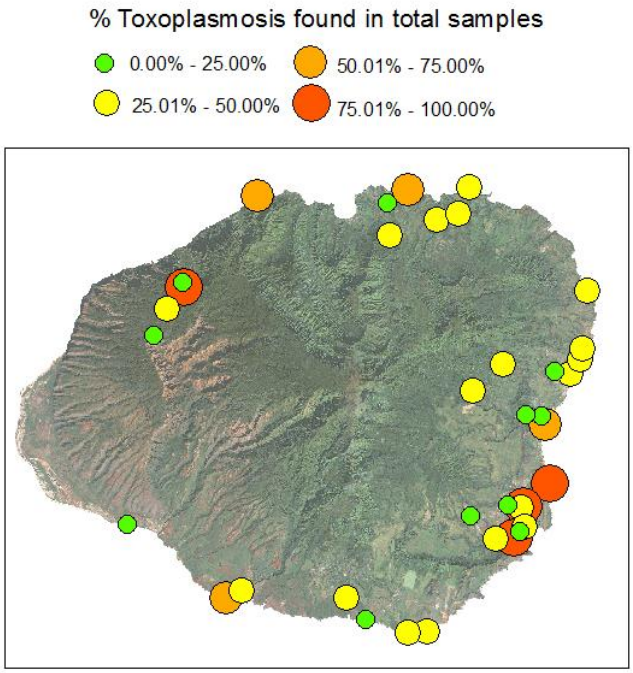
Toxoplasma gondii is a globally prevalent apicomplexan parasite that infects a wide range of avian and mammalian hosts including wildlife, livestock, and humans. Identifying environmental factors that predict and/or impact *T. gondii* infections is important for mitigating disease risks. The island of Kauai presents excellent opportunities to study spatial and environmental covariates of *T. gondii* prevalence due to a) high landscape heterogeneity spanning a small geographical area, b) the presence of an ideal sentinel species, the feral chicken (*Gallus gallus*) throughout much of the island, and c) recent evidence that *T. gondii* contributes to local declines of Hawaii's endemic bird and mammal species. Despite these compelling opportunities, very little is presently known about the prevalence or distribution of *T. gondii* in Hawaii. In this study, 294 Kauai feral chickens were tested for *T. gondii* using ELISA immunoassays for IG-M. 117 chickens (39.8%) tested seropositive, indicating active infections acquired within a 6 month period. Prevalence varied among the 34 sampled localities was positively correlated with their proximities to the coast ($p=0.008$) and unvegetated soil types ($p=0.036$). These findings reveal that *T. gondii* is both prevalent and heterogeneously distributed among Kauai's diverse habitats. This variability offers insight to the factors that predict *T. gondii* prevalence within the landscape, and likely also impact infection risks for humans and endangered wildlife.

Overall Project Progress

Field sampling of feral chickens on Kauai has concluded, as well as data analysis and interpretation. The research group is in the final stages of manuscript editing, with the intention of submitting for publication in January 2019. For the purposes of maintaining data integrity, it is requested that data and methodology is not shared or distributed until the time of publication.

Specific Metrics for Project

- One CTAHR faculty member and one technician were used to conduct field surveys for this project. Two associated researchers from Auburn University and Michigan State University contributed to field activities and manuscript completion.
- An anonymous donation of a microplate reader ($6000) was made to UH CTAHR in order to conduct the pathogen analysis.
- Three trap types were utilized to capture feral chickens: Havahart large live animal traps, funnel traps, and door traps. The latter two trap types were based on a design for portable construction of waterfowl traps [Wilson 2005].
- Sampling was conducted on public access areas, agricultural lands, and private land when permission from landowners was given.
- 294 chickens were samples over 34 unique sites throughout Kauai over a 3 month period.



Plans for Project Findings

- A manuscript of this body of work has been prepared and will be submitted for publication by January 2019.
- A publication summary will be disseminated to local organizations and researchers to be used as reference for agriculture, and land and wildlife management purposes.
- This research has opened the door for the technician's graduate research through Auburn University.