Project Report – TIE Environmental Interdisciplinary Research Grant

Investigating Habitat Suitability and Climate Impacts on an Endangered Waterbird

Charles van Rees & M. Alejandra Muñoz

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Summary: Environmental interdisciplinary research grant award funding was used for transportation, housing, and salary to support Alejandra's field work on Oahu, Hawaii (United States) from May-July 2016. Alejandra collected habitat data on the habitats of an endangered waterbird which she will use for an interdisciplinary modeling project during her junior and senior years. Alejandra's efforts in the field more than tripled the existing dataset for the project, increasing the sample size by 34 wetland habitats. She also acted as a field assistant for Charles, who completed the field data collection needed for two chapters of his Ph.D dissertation. Together they caught, banded, and feather-sampled 63 Hawaiian gallinules across 7 wetlands on the island. Data for Charles' projects will be used in related interdisciplinary work with the Water Diplomacy program.

Full Description: Field work for this project took place from May 15 – July 23 2016 on Oahu, Hawaii, where Charles van Rees was continuing data collection for his doctoral dissertation on the movement ecology and conservation of the Hawaiian gallinule (*Gallinula galeata sandvicensis,* HAGA), an endangered subspecies of waterbird endemic to the Hawaiian islands. TIE Interdisciplinary research grant funding was used to support travel and salary for M. Alejandra Muñoz to perform field work for the collaborative, interdisciplinary project proposed in Spring 2016. The goal of the project is to model the habitat requirements of HAGA and combine these with climate and hydrological models to predict changes in distribution and abundance of these birds in future climate scenarios. Empirical data on the habitat use of this species is essential to the accuracy and applicability of model results.

Using methods tested in 2014-15, Alejandra collected habitat and abundance data for 34 new wetland habitats on the island, and completing preliminary data that was left incomplete the previous year. She performed these tasks under Charles' supervision and collaborated with State, Federal, and non-profit biologists in the field. Her contributions to preliminary datasets for the study more than tripled the amount of information collected on HAGA habitat associations and abundance. Now entering her junior year, Alejandra will work with the proposal authors and Charles to design and test models as described in the research proposal, using stages of this project for independent study.

In addition to her specific independent research tasks, Alejandra also worked as a field assistant for Charles' doctoral work, which focused on exploring the movements of HAGA by direct tracking and examination of their genetic population structure. The field crew on this project, nicknamed "Team Gallinule", consisted of Charles, Alejandra, a collaborator and federal research technician named Marty Kawasaki, and another research assistant named Amanda Sandor. The team captured, banded, and collected feather samples from an additional 63 gallinules as part of this ongoing research, and also collected samples from 3 wetlands that have never before been sampled. The HAGA research team also collected resighting information on previously banded individuals, contributing to life-history and

survival information, and outfitted 15 HAGA with coded radio transmitters to track their locations across time.

Charles and his assistants also gave public outreach presentations to raise the conservation profile of Hawaiian waterbirds; these took the form of a public-access TV spot (http://olelo.granicus.com/MediaPlayer.php?view_id=19&clip_id=55737), an educational lecture at a state park (https://www.youtube.com/watch?v=XbAYM9PnpRg), and talks for the Hawaii Audubon Society and a grassroots environmental non-profit called the Livable Hawaii Kai Hui.

This summer experience provided excellent opportunities for professional and academic development for Alejandra, whose current career aspirations are to become a wildlife scientist or ecologist. She received training in research methods from field ecology, ornithology, and animal behavior. She gained valuable experience in capturing, handling, measuring, and banding wild birds, performing outdoor ecology research, and working with collaborators as part of a scientific team. Alejandra received academic and professional mentoring from Charles as well as two other scientists, one a state and the other a federal employee.

Images:

Alejandra holds a HAGA while it is being fit for a radio-transmitter; hood

Alejandra surveys a wetland for HAGA using a playback of recorded calls

Team gallinule in front of a community-restored wetland after giving a talk on wetland conservation in Hawaii

Alejandra measures the tarsus (leg) length of a captured gallinule