Warren J. Baker Endowment
for Excellence in Project-Based Learning
Robert D. Koob Endowment *for Student Success*

FINAL REPORT

Final reports will be published on the Cal Poly Digital Commons website(http://digitalcommons.calpoly.edu).

I. Project Title

UAV Wildlife Tracking

II. Project Completion Date

12/31/2019

III. Student(s), Department(s), and Major(s)

(1) Kevin Bender, Electrical Engineering Department, Electrical Engineering

(2) Tyler Couvrette, Electrical Engineering Department, Electrical Engineering

(3) Nicolas Cucinella, Electrical Engineering Department, Electrical Engineering

(4) Katie White, Animal Science Department, Animal Science

(5) Sarah Bartak, Animal Science Department, Animal Science

(6) Christopher Boone, Mechanical Engineering Department, Mechanical Engineering

(7) Olivia Lockhart, Aerospace Engineering Department, Aerospace Engineering

IV. Faculty Advisor and Department

Dr. Marc Horney, Animal Science Department

Dr. Dean Arakaki, Electrical Engineering Department

V. Cooperating Industry, Agency, Non-Profit, or University Organization(s)

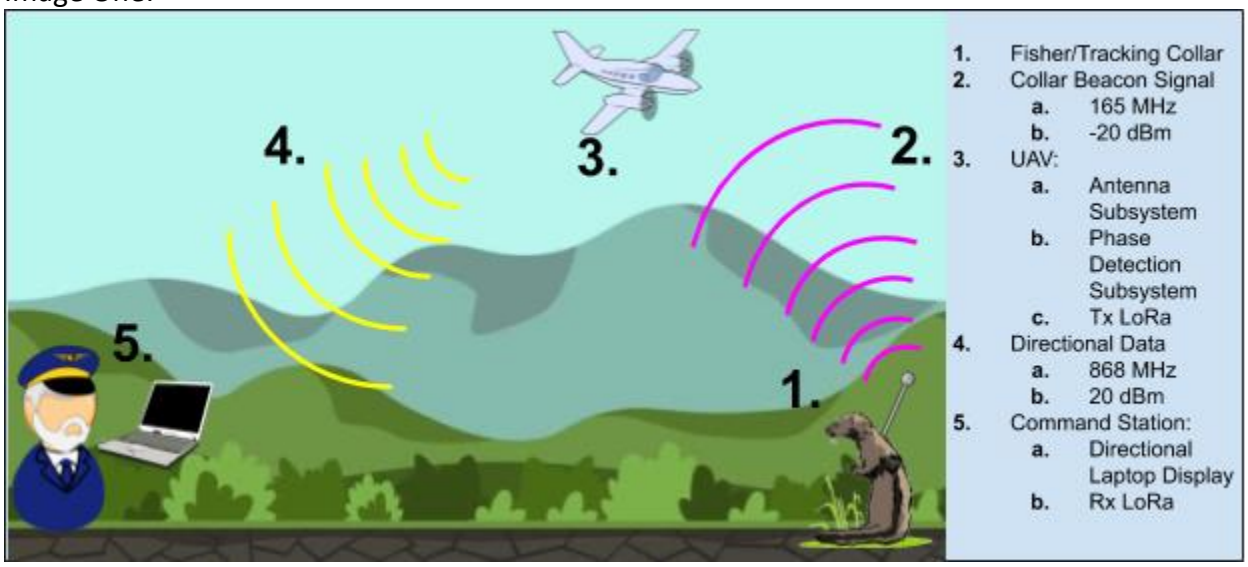
United States Forest Service

VI. Executive Summary

Over the past year, this team has designed and prototyped the first modular aerial tracking system used with Lotek systems. Students developed new technology necessary to integrate the existing USFS collars with a drone. The design is capable of adapting with the technology allowing for future development in efficiency and automation. Looking forward, this project will enable the USFS, with the aid of Cal Poly students, to better understand collared animals like the fisher, and it will continue to push for innovative ideas to not only support other animal conservation, but to provide solutions to future challenges.

Image one is a diagram of the system used in this project. Students developed new technology that allowed collar signals on the endangered fisher (1) to be received by antenna placed onto the UAV (3) and transmitted to a on ground team of Cal Poly students for processing (5).

Image One:



VII. Major Accomplishments

(1) Designed and prototyped the first modular aerial tracking system used with Lotek systems in cooperation with the United States Forest Service.

(2) Mapped areas in the Sierra Mountain Range to determine potential launch sites for the Unmanned Aerial Vehicle to allow tracking of the Endangered Fisher.

(3) Interviewed by and had a Mustang News article published about the project to the Cal Poly College of Engineering page. Link to the article can be found here: https://engineering.calpoly.edu/search-weasels

VIII. Expenditure of Funds

The project was awarded $2,694.59. No travel was required this year, so all funds allocated for that use were not used. Equipment purchases totaled $1,197.70 to complete the project. This totally resulted in 44% of the total budget to be utilized leaving $1,496.89 remaining in the account upon completion.

IX. Impact on Student Learning

The UAV Wildlife Tracking project developed into a multiple disciplinary collaboration. Students from the Electrical Engineering department got to apply their knowledge on a real-world example project. Animal Science students had the opportunity to apply animal behavior principles to a larger more complex engineering system. The Aerospace Engineer student got the opportunity to bridge the gap between engineering and real-world application by providing unmanned aerial vehicle information and providing flight plan information and specs. Together this project brought students together on a consistent project that would probably never have worked together without this experience. Moving forward this multiple disciplinary project will continue to advance due to the generous support from the Baker Koob Endowment.