COST-EFFECTIVE AUTONOMOUS MONITORING OF MILITARY RANGES FOR THREATENED/ENDANGERED SPECIES

PROJECT OVERVIEW

Many DoD installations currently survey threatened/endangered species (TES) as a requirement of federal regulations but surveys can be costly and time-intensive. The objective of this project was to demonstrate and validate the use of autonomous cameras (e.g. game cameras) and machine learning software for animal identification and surveys. The demonstration and validation includes 1) field validation of the autonomous recording devices for monitoring TES on military lands, 2) testing of machine learning algorithms for detecting animals on images and videos; and 3) preparation of guidance documents for use by military land managers.

Game camera images of wildlife and pollinators at Fort Bliss, Fort Hood, and Fort McCoy.

BENEFITS

Results of this demonstration documented 1) high accuracy (95%) for open source deep learning algorithms to identify whether or not animals are present in game camera images; 2) Up to 50 times higher effectiveness for the use of cameras to document insect visitation at flowers compared to traditional methods, and (3) Use of AI algorithms to prescreen game camera images resulted in 300-fold decrease in labor costs. As a result of this program, cameras have been employed at Fort Bliss (TX), Fort Polk (LA), Fort Hood (TX), Fort McCoy (WI), PTA (HI), and Camp Ripley (MN)

PATH FORWARD

Technology transfer has been accomplished through 1) results of demonstration included in presentations to National Military Fish and Wildlife Association; 2) software training and tutorials to installation personnel; 3) five articles in scientific journals, including guidance on set-up and deployment of cameras; and 4) a game camera loaner program was initiated whereby cameras were purchased and deployed at several installations. Additional technology transfer activities are ongoing including coordination with US Army G-9, presentations to military personnel and additional journal articles in preparation.

FOR FURTHER INFORMATION

National Defense Center for Energy and Environment
http://www.denix.osd.mil/ndcee/home
US Army Corps of Engineers Engineer Research and Development Center – Construction Engineering Research Laboratory
https://www.erdc.usace.army.mil