National Defense Center for Energy and Environment

ENVIRONMENTAL DNA SURVEILLANCE OF THREATENED/ENDANGERED SPECIES ON MILITARY RANGES

PROJECT OVERVIEW

Environmental DNA (eDNA) analysis, or the detection of trace DNA shed by organisms into their environment, can offer a rapid, non-invasive, and cost-effective option for monitoring threatened and endangered species (TES), but this state-of-the-art technology is underutilized on military installations. This project (1) demonstrated the use of eDNA analysis as a viable monitoring tool to inform wildlife management on military lands; (2) evaluated sampling, laboratory, and analytical strategies to optimize eDNA detection performance; and (3) developed protocols and guidance materials to facilitate wide-spread adoption of eDNA surveillance techniques for monitoring TES and other species of conservation concern on military ranges.

Analyzing eDNA in water samples to detect threatened and endangered species on military installations

BENEFITS

This project demonstrated the use of eDNA, and associated cost-efficiencies, to greatly expand existing survey efforts for several federally listed species that occur on military ranges, ensuring greater access and flexibility for military training. Generally, eDNA analysis can be 2–70 times less expensive than conventional sampling. At Fort Johnson, Alligator Snapping Turtle eDNA surveys had 5.5 times higher detection rates, required 40% less labor, and allowed 84% more streams to be sampled/year compared to conventional trapping, resulting in potential savings of up to $40K/year for just a single species on a single installation. Multiplied across all TES species and installations, the costs savings would be significant for DoD.

PATH FORWARD

Methods for using eDNA analysis to monitor threatened and endangered species have since been transitioned and are now currently in use at 19 partner DoD installations. Documentation and guidance produced will further facilitate the adoption of eDNA technology for wildlife management on DoD lands, providing installation biologists and military land managers with detailed study design guidelines, field sampling protocols, and opportunities for collaborative support from Army eDNA scientists.

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FOR FURTHER INFORMATION

National Defense Center for Energy and Environment (NDCEE)
http://www.denix.osd.mil/ndcee/
Construction Engineering Research Laboratory (CERL)
https://www.erdc.usace.army.mil/Locations/CERL/About-CERL/