

EDNA AUTOSAMPLERS FOR SURVEYING THREATENED AND ENDANGERED SPECIES ON MILITARY INSTALLATIONS

PROJECT OVERVIEW

Military lands host more than 500 mission-impacting threatened and endangered species (TES), requiring installations to balance training with federal TES protections. Conventional wildlife surveys are labor-intensive, costly, and often infeasible in sensitive, hazardous, or restricted habitats. Environmental DNA (eDNA)—trace DNA shed into the environment—offers a more sensitive, cost-effective alternative, but sampling workflows are procedurally complex, contamination-prone, and dependent on external labs, limiting adoption. Automated eDNA samplers address these barriers, autonomously collecting and preserving samples with minimal training. This project will demonstrate and validate Smith-Root eDNA Autosamplers at Fort Polk, Redstone Arsenal, and Naval Base Ventura County, delivering guidance for independent, installation-led eDNA surveillance.

BENEFITS

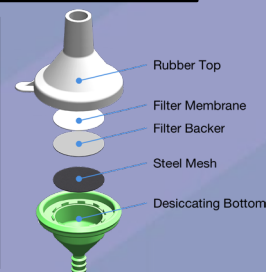
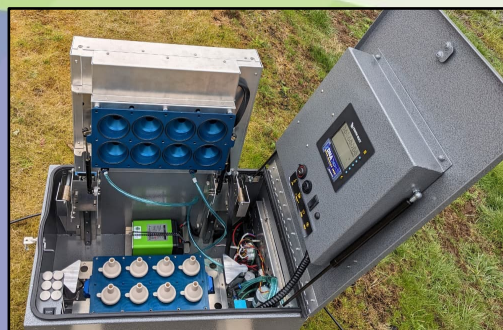
Automated eDNA sampling expands monitoring capability without harming TES or disturbing fragile habitats, enables sustained coverage of live-fire and other restricted zones without exposing personnel to risk, and supports more frequent biomonitoring at labor-constrained installations. Standardized, contamination-resistant, automated sampling enables installation-led eDNA surveys, strengthening ESA compliance, INRMP implementation, and mission readiness. Preliminary estimates indicate broad adoption could save millions annually and significantly reduce CO₂ emissions.

PATH FORWARD

Automated eDNA sampling for TES on military installations is currently at TRL 6—commercially available and manufacturer-validated but not yet evaluated in an operational setting. Still ahead, paired automated and conventional eDNA surveys at Fort Polk, Redstone Arsenal, and Naval Base Ventura County will advance the technology to higher TRLs by quantifying performance, cost, and data quality across diverse habitats and management needs. The resulting protocols and guidance will facilitate broad adoption of eDNA technologies across military installations.



Smith-Root eDNA Autosampler deployed at stream (above) and open, with eight filters loaded (below).



Self-preserving eDNA filters

DoD Executive Agent

Office of the Assistant Secretary of the Army for Installations, Energy, and Environment

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FOR FURTHER INFORMATION

National Defense Center for Energy and Environment
<http://www.denix.osd.mil/ndcee/home>

U.S. Army Engineering Research Development Center, Construction Engineering Research Laboratory (ERDC-CERL)
<https://www.erd.c.usace.army.mil/Locations/CERL/>