

**Strategic Environmental Research and Development Program  
(SERDP)**

**FY 2022 STATEMENT OF NEED**

**Resource Conservation and Resiliency (RC) Program Area**

**THREATENED, ENDANGERED, AND AT RISK TERRESTRIAL  
SPECIES' RESPONSE TO MULTIPLE STRESSORS**

**1. Objective of Proposed Work**

The objective of this Statement of Need (SON) is to advance scientific understanding of Department of Defense (DoD) relevant threatened, endangered, and at risk species (TES) and their population response to exposure from multiple stressors. Of particular interest is interdisciplinary research (i.e., terrestrial ecology, non-linear systems, toxicology/epidemiology, stress physiology, population biology, or others) to explore solutions to the problem of predicting the effects of multiple stressor interactions with population, including the relevant theory, data, and measurement systems required for understanding the cumulative effects of exposure to multiple stressors. Terrestrial species of relevance to DoD include, but are not limited to, the Golden-cheeked warbler (*Setophaga chrysoparia*), Streaked Horned lark (*Eremophila alpestris strigata*), and Least Bell's vireo (*Vireo bellii pusillus*). All proposers must provide the rationale for species selected for examination in their proposals.

**2. Expected Benefits of the Proposed Work**

The expected benefit of the proposed work is the development of fundamental knowledge regarding the impact of multiple stressors on DoD relevant terrestrial species. The knowledge derived from this research will ultimately be used for the development of improved and more cost effective ecosystem management methods, particularly for DoD-relevant TES populations.

**3. Background**

Much of the existing research on interactions between effects of stressors on living systems involves factorial experiments with species or systems in settings where treatments can be replicated and controlled. Factorial experiments are useful for detecting the presence of interactions, but because such systems are usually only exposed to one level of each stressor, they lack sufficient information to predict responses at varying levels of stressors present in nature. Meta-analyses of results from studies of multiple stressors on various species have been conducted, but often no general pattern emerges that allows for stressor effect prediction.

Currently, in the absence of alternative approaches, environmental assessments may not quantify cumulative effects or merely point out concerns surrounding potential synergistic effects. Those that do attempt to make predictions to guide management actions may rely on the predicted effects of individual stressors in spite of the consensus that such reliance may be misplaced. A similar problem also holds for estimating the effect of multiple doses of the same stressor. The current

state of knowledge then is that cumulative risk from exposure to multiple stressors can often not be predicted based on existing information for individuals or their populations.

#### **4. Cost and Duration of Proposed Work**

The cost and time to meet the requirements of this SON are at the discretion of the proposer. The proposals must describe a complete research effort. It is anticipated that the scope of this SON is such that a multi-disciplinary team will be required to execute a successful effort. Nonetheless, single investigator efforts may compete successfully. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. Preference will be given to proposals that best address and integrate the research objective. Two proposal options are available:

**Standard Proposals:** These proposals describe a complete research effort. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. SERDP projects normally run from two to four years in length and vary considerably in cost consistent with the scope of the effort but must not exceed \$900,000 per year. Preference will be given to proposals that efficiently address and integrate specific research objectives. Project budgets vary but must remain consistent with the scope of the effort.

**Limited Scope Proposals:** Proposers with innovative approaches to the SON that entail high technical risk or have minimal supporting data may submit a Limited Scope Proposal for funding up to \$250,000 and approximately two year in duration. Such proposals may be eligible for follow-on funding if they result in a successful initial project. The objective of these proposals should be to acquire the data necessary to demonstrate proof-of-concept or reduction of risk that will lead to development of a future Standard Proposal. Proposers should submit Limited Scope Proposals in accordance with the SERDP Core Solicitation instructions and deadlines.

#### **5. Point of Contact**

Kurt Preston, Ph.D.

Program Manager for Resource Conservation and Resiliency  
Strategic Environmental Research and Development Program (SERDP)

4800 Mark Center Drive, Suite 16F16

Alexandria, VA 22350-3605

Phone: 502-528-0796

E-Mail: [Kurt.T.Preston@usace.army.mil](mailto:Kurt.T.Preston@usace.army.mil)

For Core proposal submission due dates, instructions, and additional solicitation information, visit the [SERDP website](#).