

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

FY 2014 STATEMENT OF NEED

Resource Conservation and Climate Change (RC) Program Area

RECOVERY OF ECOLOGICAL PROCESSES IMPACTED BY NON-NATIVE INVASIVE SPECIES IN THE PACIFIC ISLANDS

1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to improve our fundamental and applied understanding of ecological processes in the Pacific Islands that have been altered by the introduction of non-native invasive species (NIS) on lands and near-shore coastal environments managed by the Department of Defense (DoD). Improved understanding is needed to support recovery of key ecological processes that are important to the long-term sustainability of Pacific Island ecosystems.

Research proposals are sought that improve our understanding of: (1) how key ecological processes have been altered from their historical condition by the introduction, establishment, and spread of NIS and (2) how to restore these processes to restore ecological function, desired ecosystem services, and to the extent feasible, the recovery of threatened, endangered, and at-risk species (TER-S).

Research needs include but are not limited to improvements in our understanding of the following:

1. Effects of altered ecological processes, such as seed dispersal, and how such disrupted processes may need to be restored in the absence of those extirpated species that may have served such purposes.
2. Implications of the management actions taken to control various NIS, with a focus on resultant alterations in native and non-native species trophic interactions and the subsequent effects on native species persistence, especially TER-S, and ecological processes.
3. Conditions necessary to foster recovery of extirpated or nearly extirpated TER-S when such recovery is still possible, including how changes in genetic diversity and the presence of introduced diseases and pathogens may affect recovery.
4. Management of novel ecosystems and desired ecosystem services when recently extirpated species cannot be restored.
5. Implications of climate change on recovery, resilience, and adaptive capacity of mostly native or desired novel ecosystems and their subsequent management in a dynamic environment.

Proposals submitted in response to this SON may address one or more of the research needs listed above. Proposals to develop single taxon NIS control methods will not be considered.

2. Expected Benefits of Proposed Work

The desired outcomes are knowledge and tools for managers to: (1) recover or establish ecological processes in mostly native or desired novel ecosystems that are now or are potentially impacted by NIS, (2) establish those conditions that foster the recovery of TER-S where and when feasible and desirable, and (3) address the implications of climate change for recovery and subsequent management.

3. Background

The Pacific Islands, because of their isolation, possess unique biological diversity. Many of the species are endemics. This evolutionary legacy also makes the natural biotic communities that DoD manages susceptible to anthropogenic disturbance, be it human development or the introduction of non-native species. In particular, introduced species that have become invasive have altered the composition, structure, and ecological function of Pacific Island ecosystems. Responses to date have focused primarily on control or eradication strategies for the worse invaders, such as the brown tree snake (*Boiga irregularis*) on Guam. In the long-term, however, recovery strategies will need to recognize that non-native species will likely remain at certain levels and native species extirpations may not be reversed. As a result, the focus of this SON is not on the direct control of invasive species; instead, the focus is on proposals that examine other challenges associated with recovery of Pacific Island ecosystems altered by invasion. In particular, these challenges include those ecological processes in the Pacific Islands that have been altered by NIS and either their subsequent recovery or establishment to restore ecological function, desired ecosystem services, and TER-S recovery. Finally, climate change and climate variability may alter remnant ecological processes in these already stressed ecosystems. Process recovery in native or desired novel ecosystems will need to take future changes in climate into account.

Complementary SERDP/ESTCP-Funded Projects: SERDP and ESTCP have supported several projects relating to recovery of dry and wet tropical forests and TER-S in the Pacific. A brief description of these completed and ongoing projects can be found at the SERDP and ESTCP website (www.serdp-estcp.org/Program-Areas/Resource-Conservation-and-Climate-Change).

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. Two 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 five years in length and vary considerably in cost consistent with the scope of the effort. It is expected that most proposals will fall into this category.

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 \$150,000 and approximately one 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

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For Core proposal submission due dates, instructions, and additional solicitation information, visit the SERDP website at www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations.