COOPERATIVE ECOSYSTEM STUDIES UNIT
REQUESTS FOR STATEMENT OF INTEREST

To conduct a project entitled

Population Viability Analysis for Feral Horse Management Scenarios at Theodore Roosevelt National Park

February 4, 2025

Responses to this request for Statement of Interest (SOI) will be used to identify a lead for a project to be funded by the National Park Service (NPS) for purposes of feral horse management at Theodore Roosevelt National Park (THRO, park)

PROJECT TITLE

Conduct Population Viability Analysis for Feral Horse Management Scenarios at Theodore Roosevelt National Park

DEADLINE

We request that Statements of Interest be submitted by Thursday, February 20, 5:00 pm CT. This Request for Statements of Interest will remain open until that time.

CONTACT

Direct questions and statements of interest to: Blake McCann, blake_mccann@nps.gov, 701-623-4730 x1433.

BACKGROUND

Theodore Roosevelt National Park manages feral horses (currently with a herd size of roughly 200 animals), alongside native elk, bison, and other species of conservation concern. Non-native species including horses and cattle were ranched free-range in the Badlands of North Dakota since the late 1800s. With park establishment in 1947, efforts began to remove cattle and horses from NPS lands. However, in 1956, when the park perimeter was fenced (enclosing approximately 46,000 acres) to enable re-introduction of bison, remnant bands of horses remained within the South Unit of THRO. Roundup and sale became the primary method of horse herd management. An Environmental Assessment was completed in 1978 defining management techniques and establishing a population objective of 35-60 animals. Since then, much research (habitat use, forage, genetics, contraception, etc.) has been conducted and published on this herd, and current research includes a spatial use study informed by combination GPS/VHF collars. THRO seeks to build off this research and develop scenario-driven population viability models that will support science-informed decision making as the park sets future herd management policies and objectives.

BRIEF DESCRIPTION OF ANTICIPATED WORK

NPS wishes to conduct a Population Viability Analysis (PVA) that considers horse herd genetics, management scenarios, population objectives, and biological factors, to ensure that management

actions minimize the ecological effects of the herd on the natural ecology of the park while satisfying concerns regarding genetic diversity of the horse herd.

Key questions include:

-Which management scenario(s) increase and sustain genetic diversity of the horse herd at healthy levels (i.e. in the absence of genetic disease and inbreeding depression) for the next century or longer?

-What number of horses and demographic stratification of the herd is necessary to ensure the herd's genetic diversity, relative to intensity of management?

-Which external genetic sources provide the greatest benefit to the herd for genetic augmentation, given the current genetics and phenotypic variation of the herd.

We anticipate that this PVA will evaluate demographic and genetic change over time (informed by current herd genetics and potential source herd genetics) using up to ten distinct management scenarios and up to six putative source herds for gene flow to augment the herd.

The NPS has an extensive catalog of existing data and samples that the selectee may utilize to conduct this analysis. Tissue samples (hair follicles) for approximately 95% of the herd will be provided by NPS. Microsatellite and ~70k single nucleotide polymorphism genotypes are already available for approximately half the herd and will be provided. We anticipate the selectee, in consultation with NPS, will evaluate the adequacy of the existing samples and data for completing PVA analysis. Where additional data are required to perform modeling or constrain uncertainty in the modeling, the selected investigator, in consultation with NPS, may analyze additional molecular markers (e.g., microsatellites, mitochondrial DNA, single nucleotide polymorphism, nuclear sequence, whole genome technology, or other appropriate molecular tools).

This project seeks to have preliminary results by September 30, 2025. Subsequently, final PVA results will be compiled in a professional format and submitted for peer review and publication in a scientific journal. Genetic and other ancillary research objectives will be supported, based on vendor interest, but the key deliverable of a rigorous PVA, as described above, must be the primary focus of the project in the near term. Park staff and other subject matter experts on feral horses will be identified by NPS to collaborate with the selectee, to support scenario development and parameterization of the PVA, and the project will be further supported through a research permit authorized by the park.

The candidate selected will be required to prepare a Statement of Work regarding the research to be conducted. The candidate selected will also be required to submit status reports (1-4 per year) each year of the agreement to provide updates on measure of progress and meeting objectives.

KEY PRODUCTS

-PVA-parameterizable management scenarios co-developed with NPS and stakeholders.

-Individual-based PVA model including all code, parameters, viability estimates, uncertainty estimates, and other model outputs required to reproduce the model on NPS systems.

-Data (including raw output files and code used for post-processing) obtained from genetic analyses.

-Code used for statistical analysis with sufficient documentation to reproduce analyses on NPS systems.

-Peer-reviewed final report detailing individual-based population viability analysis comparing alternative management scenarios for the feral horse herd. Materials and methods appendices should thoroughly document all laboratory analyses, modeling, and statistical analyses.

PERIOD OF PERFORMANCE

Please note, this project seeks to have preliminary results by September 30, 2025, but the full period of performance for this Cooperative Ecosystem Studies Unit Cooperative Agreement will be up to 36 months.

MATERIALS REQUESTED FOR STATEMENT OF INTEREST

Please provide the following via e-mail attachment to blake_mccann@nps.gov
(Maximum length: 7 pages, single-spaced 12 pt. font).

1. Name, affiliation and contact information.
2. Brief Statement of Qualifications including:
    a. Biographical Sketch
    b. Relevant past projects and clients with brief descriptions of these projects - demonstrated results including links to published works.
    c. Staff, faculty or students available to work on this project and their areas of expertise.
3. A detailed study proposal that summarizes strategy, approach, and special capabilities, timelines, roles and responsibilities of personnel, specific tasks to be conducted, and deliverables. Please be as specific as possible.
4. A detailed cost estimate of the proposed work to include a breakdown of all labor, materials, and travel (see attached worksheet).

FUNDS AVAILABLE AND ELIGIBILITY

We are intending to use fiscal year 2025 funds for this project. A budget of $70,000 to $80,000 inclusive of 17.5% Cooperative Ecosystem Studies Unit (CESU) indirect costs is anticipated to be available for this effort during 2025. NPS is actively seeking additional funds for this effort, and the cooperator needs to be able to scale up or extend the project if additional funds become available. Non-federal partners of any CESU network are eligible to apply. Entities that are eligible and willing to join a CESU network prior to the final award are also eligible to apply.

REVIEW

Statements of Interest will be evaluated based on qualifications and experience of the principal investigator, and project team and proposed approach. Based on review of the Statements of Interest, a principal investigator will be invited to prepare a full application.

Knowledge, Skills, and Abilities Sought

- Knowledge of population genetics and implementation of PVA for social mammals including modeling of genetic change over time, based on gene flow, population demographics, social structure, and biological factors, ideally in mixed-grass prairie ecosystems.
- Experience in large mammal population management and human dimensions.
- Demonstrated ability to work as part of a large culturally diverse teams consisting of individuals, organizations, and tribal representatives.
- Special experience and knowledge of mammalian ecology, population genetics, and molecular statistics.
- Special experience and knowledge of Population Viability Analysis and related statistical approaches.
- Experience with equid species is preferred, but not required.