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May 24, 2013

Mr. Tim Rubald
State of Nevada Sagebrush Ecosystem Program
timrubald@sagebrusheco.nv.gov

**Subject: Conservation Credit System**

Dear Mr. Rubald:

Attached please find The Nature Conservancy's (TNC) executive summary response to the State of Nevada Sagebrush Ecosystem Program Request for Information (RFI) for a Conservation Credit System for Sage-Grouse Habitat. TNC would be pleased to provide further details about the attached methodology upon request. Please note that TNC's first application of the methodology is underway to develop a conservation plan for 1.2 million acres of land, both private and public, managed by Newmont Mining.

Thank you for your consideration.

Sincerely yours,

Michael Cameron
Associate State Director

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# Sage Grouse Conservation Forecasting

## A Methodology for Establishing Metrics and Forecasting Sage-grouse Habitat Suitability in Nevada

**May 24, 2013**

### Executive Summary

Following is The Nature Conservancy's (TNC) response to the State of Nevada Sagebrush Ecosystem Program Request for Information (RFI) for a Conservation Credit System for Sage-Grouse Habitat. TNC's Greater Sage-Grouse (GSG) Conservation Forecasting approach integrates computer-based, operational state-and-transition models developed by TNC's Director of Conservation Ecology, Dr. Louis Provencher, with GSG habitat suitability or population viability models. The approach applies metrics that can be used to establish equivalencies to compare changes in habitat suitability (positive and negative), or population viability, across locations and time.

Critically, sagebrush ecosystems are dynamic and change over time. Indeed, it is the general decline of these systems that has led the U.S. Fish and Wildlife Service (FWS) to determine that GSG warrant listing under the Endangered Species Act (ESA). A successful mitigation framework and conservation credit system will need to account for the expected change to future habitat suitability (or population viability) of positive management actions and of disturbances (both disturbances that are undesirable and those that are favorable to GSG). TNC's state and transition models are a quantitatively rigorous tool for predicting changes over time to all ecological systems and vegetation classes on which GSG depend. TNC's state and transition models have been utilized by the U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS),and U.S. Park Service in Nevada for regulatory decision support under the National Environmental Policy Act (NEPA)[1], and for Nevada's 2012 State Wildlife Action Plan revisions by the Nevada Department of Wildlife (NDOW). The approach supports the following features and products:

- Spatially explicit sage-grouse habitat restoration action plans for mitigation areas, including forecasting the likely degree of effectiveness of alternative conservation actions and management scenarios;
- Identify the most cost-effective combinations of management actions using Return on Investment (ROI) analysis;
- Evaluate likely degree of impact over time of negative disturbances;
- Evaluate resilience of existing habitat;
- Account for background ecological trends, cycles, and severe events that are currently, and will continue to alter vegetation into the future (e.g., continuing spread of cheatgrass); and differentiate between changes to future habitat viability that are due to such background trends from those changes that are due to management actions.

[1] Ward Mountain Landscape Conservation Forecasting (Ely Ranger District and Ely BLM District), Great Basin National Park Landscape Conservation Forecasting, Cave & Lake Valleys Landscape Conservation Forecasting (Ely BLM District), South Spring Valley Landscape Conservation Forecasting (Ely BLM District).

- Provide metrics and equivalencies for calculation of net impacts of disturbance and mitigation actions;
- Peer reviewed scientific methodology and documentation necessary to support regulatory decision making; and
- Establish a foundation and framework for long-term monitoring of Greater sage-grouse viability.

The planning approach includes several elements: 1) soil surveys and inventory of ecological site descriptions; 2) high-resolution remote sensing to confirm ecological systems and current vegetation classes; 3) estimation of current habitat condition using ecological departure and habitat suitability/population viability indices for GSG and, potentially, other critical species, including mule deer and pygmy rabbit;[2] 4) iterative workshops with local range experts to calibrate models and develop management alternatives; 5) forecasting the effects, and cost-effectiveness, of alternative management scenarios; 6) production of treatment maps and final report documentation.

Based on TNC's current understanding of the model that will be developed by Dr. Peter Coates for the State, and our understanding of how the State intends to use this model, we believe TNC's tools are fundamentally complimentary with Dr. Coates' model. Insofar as the Coates' model will be used to establish baseline information on the geographic distribution of current GSG habitat types and values, TNC's methods will enable participants in the Nevada Conservation Credit System to estimate the likely changes to those values over time that will result from: a) disturbance actions (e.g. infrastructure development); b) management actions (e.g. revegetation, mowing, tree removal, etc.); and c) background disturbances.

TNC's methodology supports a high degree of precision and accuracy. It is not clear to TNC, based on available information in the RFI, how the level of rigor of TNC's models will and should be reconciled with spatial data of different resolutions that may be used as part of the State's crediting system. Spatial scale will effect estimates of mitigation equivalencies.

The approach is transparent in the following respects: a) the model parameters and algorithms are available for review; b) the models are calibrated for each application to account for variability of conditions across the landscape, such as success/failure rates and costs of management actions; and c) management scenarios are developed using an iterative expert workshop approach that includes public and private sector local range managers who are most familiar with the landscape.

TNC's methodology is not offered as a comprehensive approach for the State of Nevada's conservation credit system. It does not speak to what should be appropriate mitigation ratios or tolerances for data precision and uncertainty (especially spatially) that will affect State-wide calculations of equivalencies. It does not speak to the required processes or protocols for bringing parties together into exchanges and facilitating transactions. Nor does it speak to the fiduciary aspects of a credit system. Rather it provides a rigorous and scientifically defensible methodology for metrics, establishing equivalencies, and accounting. Moreover, the system requires ground-verified high resolution remote sensing data, and the availability of robust GSG demographic data. Given the data and time requirements of the modeling tools, the most appropriate scale for the application of TNC's methodology typically will range from between 50,000 acres up to two or more million acres.

Of the concepts listed in the RFI, TNC's methodology can contribute to the following:

[2] Mule deer and pygmy rabbit are imperiled by the same general loss of habitat experienced by GSG, and will benefit from many of the same actions taken to conserve GSG.

- Metrics to determine fair market values for specific GSG habitat management actions in all types of GSG habitat.
- Metrics to value habitat disturbances and impacts (including over time as vegetation matures.)
- Metrics to be developed for mitigation actions that address and reduce the risks to GSG and their habitat in Nevada. Concepts include, but are not be limited to:
    a. Actions on public and private lands;
    b. Actions in seasonal habitats;
    c. Actions that incorporate state and transition models to guide treatments that would maintain or enhance ecological resistance to invasive weeds and site resilience after disturbance; and,
    d. Actions that address wildfire and invasive species.

TNC will provide more thorough documentation of the methodology upon request.

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