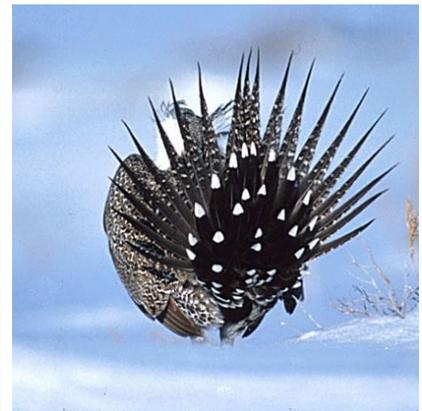
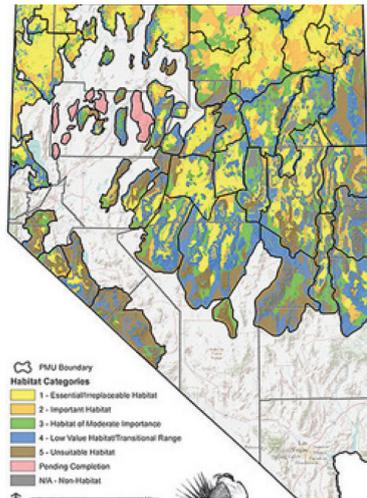


# REQUEST FOR INFORMATION



State of Nevada Conservation Credit System for Sage Grouse Habitat

State of Nevada Sagebrush Ecosystem Program

May 24, 2013





## EXECUTIVE SUMMARY

### Company Overview

HDR provides a full suite of consulting services with a professional staff that represents a full spectrum of scientific disciplines. Our business model is based upon strong local staffing supported by company-wide resources and expertise through 165 offices with over 7,700 employee-owners worldwide. We bring world experience and skills to our clients' doorstep.

For this project, we would integrate our diverse skills from our environmental, biological, GIS and economics staff to develop, test and utilize a variety of economic and environmental models. These models will be developed using state-of-the-art research findings and algorithms, typically with assistance from experts from academic institutions, resource management agencies, and research centers.

### Environmental, Biological, and GIS Specialists

HDR has highly qualified ecologists, biologists, environmental scientists, Geographic Information System (GIS) professionals, and other professional staff that would be incorporated into the team as necessary to support the translation of habitat and biological metrics into the economic model and build a public GIS application for the credit system as determined necessary by the council.

### Decision Economics Group

HDR's Decision Economics Group includes natural resource economists that are suited to support the Sagebrush Ecosystem Council in developing and analyzing economic components of the proposed Conservation Credit System. HDR's team offers highly-specialized economic and statistical services to assess the cost and benefit impacts of current and evolving government policies related to the protection and management of habitat.

HDR understands the delicate balance between the demands for the protection of the environment and health and the need for growth and jobs. We also understand the significant uncertainties in developing an effective greater sage-grouse habitat conservation credit program. We have a long history in demonstrating our expertise in applying economic analyses that integrates scientific knowledge while building consensus among stakeholders.

Resumes of potential team members are available upon request.



## HDR's Understanding of the Scope of Work

The State of Nevada's Sagebrush Ecosystem Program seeks innovative approaches to establishing fair market values for impacts to greater sage-grouse habitat from anthropocentric activities. The approach must be credible, flexible, and transparent. Its results should clearly communicate the costs of habitat disturbance to create incentives for effectively mitigating or avoiding habitat disturbances on both public and private land. To be successful, the methods should be consistent with other federal land management policies and impact evaluation methods of the Bureau of Land Management (BLM), U.S. Forest Service (USFS), and the Fish and Wildlife Service (FWS).

In fact, it is of particular interest for all concerned parties, that the habitat impact value system aid in the prevention of population decline. The credit system would be considered a regulatory mechanism to demonstrate sufficient protection and management of the species and habitat to the FWS, thereby contributing to the prevention of the listing of greater sage-grouse as an endangered species.

Accordingly, the approach should not only establish a goal related to the state's objective of no net loss of greater sage-grouse habitat, but also relate to a no net loss of greater sage-grouse population. As such, the analysis of fair market value should be population-adjusted, whereby higher costs of a disturbance occur when species populations are lower, not just when the quantities or quality of a habitat is impacted. A series of fair market values would need to be developed by region, habitat type or quality, and population level, and then be regularly updated to account for new species population estimates.

## Scope of Services

HDR proposes to offer the following services and deliverables at the discretion of the council:

- Conduct consensus-building workshops for the Conservation Credit System;
- Coordinate and participate in planning sessions with stakeholders throughout the development, modeling and analysis, and implementation of the credit system;
- Conduct economic and habitat modeling to develop habitat valuation for discrete habitat types and critical species requirements based on Dr. Coates' habitat suitability modeling;
- Based on the results of the modeling, assist the Sagebrush Ecosystem Council and stakeholders in establishing a framework and mechanisms for issuing credits and tracking mitigation success;
- Create an interactive GIS-based application for use by the public to estimate credit availability for particular mitigation and conservation activities;
- Update and maintain the economic and habitat models as needed to adjust for regional and national economic conditions and habitat and population dynamics.

These tasks and associated approaches are described further below.

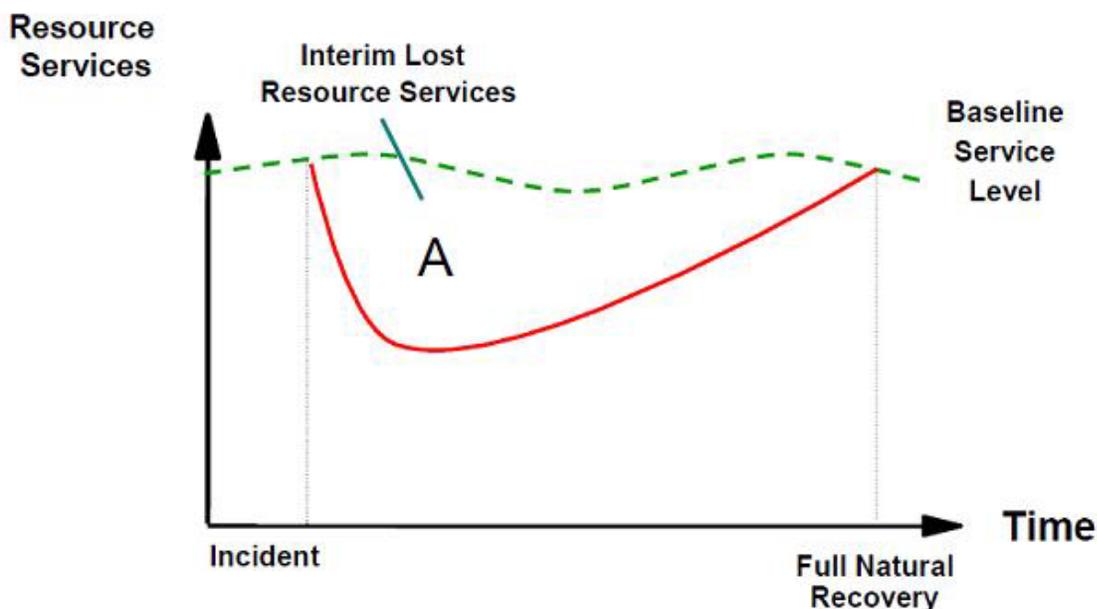


## Economic Approach to Developing Fair Market Value

HDR would propose to develop fair market values to meet the state's goals by integrating best practices and principles in ecosystem assessment and economic valuation. One approach to accomplishing this is a framework based on *Habitat Equivalency Analysis (HEA)*. HEA is a sound, and well-established approach that has been developed and applied by a variety of federal agencies to determine dollar-based impacts to ecosystem services in a natural resource damage assessment context. The basic approach of HEA involves determining the cost to create an equivalent habitat to what was disturbed or lost. A key feature of the HEA approach is that it can be applied separately on different habitat types, locations or qualities to develop metrics.

The HEA approach relies on two key calculations: (a) quality-adjusted acres of habitat disturbed or lost; and (b) quality-adjusted acres of habitat created. The physical disturbance or loss of an existing habitat requires an understanding of the current and disturbed conditions (including total loss). Existing conditions account for the levels of ecosystem services and population dynamics that naturally fluctuate or that respond to external changes. Reduced quantity and quality of ecosystem services are determined from the time of the disturbance to its recovery to natural baseline conditions (if applicable). Figure 1 conceptually illustrates a habitat disturbance that begins at the time of the disturbance and until it reaches full natural recovery. If acres of habitat are permanently lost, this figure would not show any recovery in habitat services.

**Figure 1: Diagram of Compensable Damages from Lost Resource Services<sup>1</sup>**

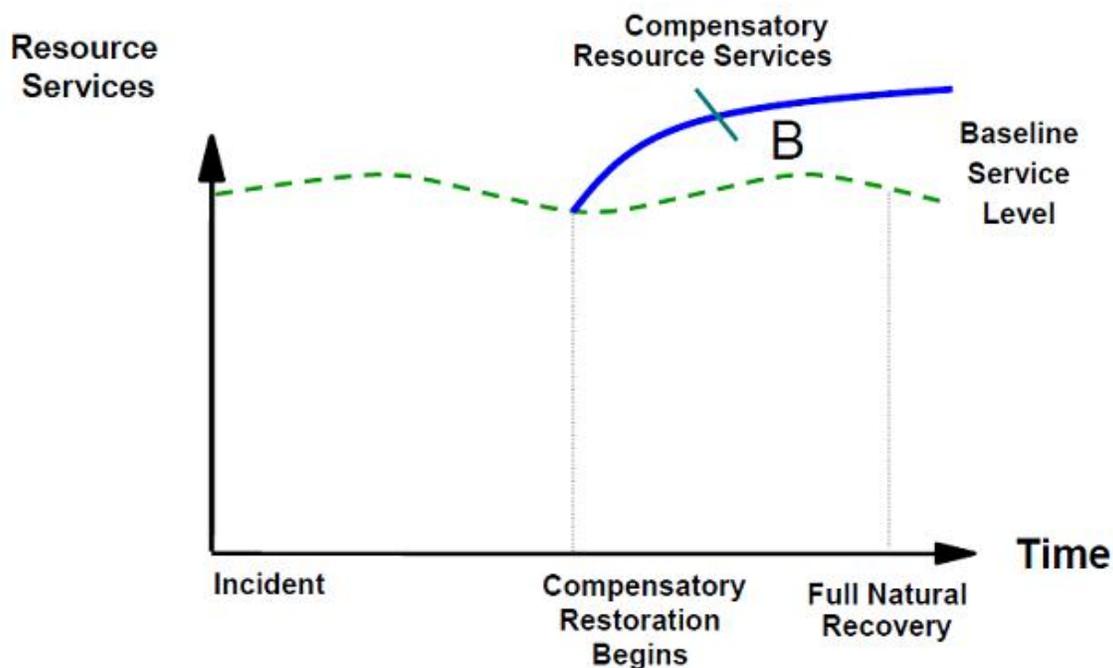


<sup>1</sup> Source: NOAA, 2011: <http://www.darrp.noaa.gov/economics/index.html>



HEA calculations determine the quantity of new, replacement acres services after accounting for quality differences. Figure 2 illustrates the replacement (or “compensatory”) acres of greater sage-grouse habitat services that would be scaled to equal any lost services, as depicted in Figure 2. In practice, this involves computing an amount of acre-years of lost habitat and determining the size of a habitat restoration project that would generate an equivalent number of acre-years of comparable habitat, adjusted for quality. The fair market value of the loss is determined from the lifecycle cost of replacing the habitat services in the rehabilitated or restored area.

**Figure 2: Diagram of Compensatory Gain in Resource Services<sup>2</sup>**



Assessments of greater sage-grouse habitat are inherently complex because of the need to account for a wide variety of factors influencing pre- and post-disturbance conditions, as well as the quality of services that may be eventually realized at the restored site. It is expected that the work on habitat suitability by the U.S. Geological Survey, led by Dr. Peter Coates, would provide a starting basis for habitat assessment. Among the considerations on factors including habitat quality are:

- Population of greater sage-grouse supported;
- Core-breeding areas;
- Types of habitat disturbances and impacts (potentially by industry);
- Permanent, temporary, and seasonal impacts;

<sup>2</sup> Source: NOAA, 2011: <http://www.darrp.noaa.gov/economics/index.html>



- Rate of growth in natural habitat service after restoration; and
- Habitat susceptibility to wildfires and invasive species.

The HEA approach can be applied to meet a number of the needs of the conservation credit system as listed in the RFI. For example, by being applicable for various types and quality of existing habitat, it would meet the needs of the scope by generating:

- Physical conversion metrics (on an acreage basis) that are associated with fair market values for specific greater sage-grouse habitat, including different seasonal uses;
- Dollar-based conversation metrics for typical lifecycle costs of habitat creation that relate to habitat disturbances and impacts;
- A market-based habitat conversation credit system that land owners can use as a structure or mechanism for efficiently creating compensatory habitat; and
- Restoration activities that reflect greater sage-grouse seasonal needs.

Also, by being linked to species population, the value of a HEA-based credit system would be adjusted if projects successfully mitigate species and habitat loss. The approach would be applicable for actions on public and private lands – wherever good quality habitat can be effectively created, protected and maintained. Finally, this approach could also be consistently applied for a wider array of habitat characteristics if it were desired to scale the credit system from greater sage-grouse habitat to the entire sagebrush ecosystem in the future.

### Uncertainty Analysis

Significant scientific and economic uncertainties are associated with establishing a Conservation Credit System. HDR proposes to account for these uncertainties through its *Risk Analysis Process (RAP)*. RAP is a structured approach to accounting for uncertainty that integrates the best available information on costs, performance and benefits, with local knowledge on the specific applicability of this information. For example, scientific studies may indeed shed light on the effectiveness of the rate of growth in habitat services due to recovery from wildfires, or conservation and habitat creation efforts, but if these studies have been conducted outside of our area of interest, some uncertainties remain. In addition, habitat replacement costs and capital and long-term maintenance may be difficult to forecast.

The RAP process entails a facilitated discussion to reach consensus among selected experts and stakeholders to reach conclusions about how to best use such data. We then facilitate consensus-building processes to agree on the influence of key factors that have an impact of the outcome. The conclusions also feed directly into HEA modeling by establishing quantified parameters that can be applied in specific areas or contexts. Accordingly, through RAP, the HEA will not simply be a scientific analysis, but become a more credible and transparent tool for establishing a robust Conservation Credit System. Results can be reviewed with the uncertainty dimensions to provide additional information on the upside and downside costs of different



credit system configurations. Through this process, our results stand up to scrutiny because they are built on the best available knowledge and stakeholder buy-in.

In sum, the RAP process would allow the council and stakeholders to identify and evaluate risks and benefits associated with the Conservation Credit System moving forward and identify the approaches and methods with the highest potential for success.

### **Structure and Mechanisms for the Conservation Credit System**

HDR views its potential role in the development of the structures and mechanisms for the credit system as a technical support role. HDR would aid in the development of the success criteria by using metrics developed through the HEA modeling. This task of developing the mechanisms may be better addressed by state policymakers and resource agencies familiar with Nevada's policies and regulations regarding financial systems. HDR still presents the following general concepts to address the Request for Information.

HEA modeling would provide a potential framework for developing specific mechanisms for assigning credit value. For example, credit may be immediately available for habitat enhancement projects that create additional habitat value instantaneously, such as the removal of encroaching pinyon pine and juniper trees within the sagebrush habitat matrix, or preserving core breeding. Other habitat restoration and mitigation projects may constitute receiving partial credit for the initial investment for habitat enhancement or creation, but would not receive full credit until specific success criteria are met.

HDR recommends that a database of all mitigation projects be created and success tracked through a common set of success criteria established by the council. The success criteria would be based on the net increase in habitat function and value over time. Credit could be issued in the form of habitat acres that would then be applied to offset discrete anthropogenic disturbances. The habitat acres credits would be based on metrics established through the HEA model for specific conservation efforts and project disturbances within specific habitat areas.

Guidelines would need to be developed to establish rules for credit transference and the use of credit to offset project disturbance within population management units or other measured and specified habitat units. Once mitigation actions and conservation efforts have been implemented, mechanisms to ensure the maintenance of habitat values over time would need to be developed. Existing mechanisms including bonding, mitigation banking, land owner incentive programs, debit systems, and other alternatives should be considered.

### **Public Interface Model**

The results of the HEA modeling and establishment of metrics would be used to develop an interactive model to assist land managers and private landowners in calculating project-level disturbance and conservation credits. Using a web-based GIS platform would allow for



geographic population and habitat data to be updated on a regular basis. This model could include “budgets” for population management units. Project disturbance and conservation/mitigation projects would be updated in this model on an annual basis. The budgets would be balanced on an annual basis to better track and achieve the no-net-loss goal.

### Model Updates and Maintenance

HDR would be available to provide model updates and maintenance as needed. The need to establish and maintain dynamic models is imperative in natural resource management applications. The models and metrics may need to be updated if better habitat or population data becomes available in the future. The model may need to be expanded and reconfigured to account for sagebrush habitat in general. In addition, the models and metrics can be adjusted to become more individual or population management focused should the greater sage-grouse become a listed species.

### Closing

HDR appreciates this opportunity to present these concepts and collaborate with the Sagebrush Ecosystem Council in support of developing a Conservation Credit System for greater sage-grouse habitat in Nevada.

Should you have any questions or require additional information to support your review and decision on selecting respondents to the Request for Information, please contact the following individuals:

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