Range-wide Greater Sage-grouse Habitat Connectivity Analysis Background/Overview

The BLM manages the majority of remaining greater sage-grouse habitat and as a result, has a key role in the conservation of the species and its habitat. Approximately half of all remaining greater sage-grouse habitat is under BLM administration. Goal 2 of the BLM National Sage-Grouse Habitat Conservation Strategy is intended to enhance knowledge of resource conditions and priorities to support habitat maintenance and restoration efforts. Completion of the range-wide greater sage-grouse habitat connectivity analysis project is an important action (2.1.2) in support of achieving this goal. In addition, the project is also an important element of the BLM National Assessment, Inventory, and Monitoring (AIM) Strategy.

Increased knowledge about the location and condition of habitats and major plant communities on BLM managed lands across broad regional settings in terms of connectivity (or fragmentation) has become an important concern in recent years. The BLM National Science and Technology Center (NSTC) has developed a GIS-based approach to analysis, monitoring, and evaluation of sage-grouse and other species habitat to help address this need. BLM is preparing this tool to support species conservation planning, wildlife program planning and implementation, monitoring and reporting of landscape conditions, land use planning, and NEPA analysis in large, regional geographic settings. This is particularly important when addressing the need to increase understanding of significant habitat areas and associated linkages in relation to the regional or range-wide context and setting. The GIS-based analysis approach is repeatable over time, readily institutionalized into BLM, and is conducted with data from existing sources and programs. Input and support from each affected BLM State is essential and necessary to complete the sage-grouse habitat connectivity analysis project. The Director has made this a priority for completion by June 1, 2007 so it is imperative that each affected state participate.

Range-wide Greater Sage-grouse Habitat Connectivity Analysis

The range-wide greater sage-grouse habitat connectivity analysis is an important element of the BLM National Sage-Grouse Habitat Conservation Strategy. By June 1, 2007 the Director has directed a complete analysis of greater sage-grouse habitat connectivity across the range of the species. Specific key management questions addressed by the range-wide greater sage-grouse habitat connectivity analysis product will be:

- *Where are the significant greater sage-grouse habitat areas?*
- *How much is there?*
- *What is the condition in terms of connectivity/fragmentation?*
- *Where is connectivity being maintained, improved, or deteriorating over time?*
- *What is inducing these changes over time?*

Analysis Approach

The approach used to conduct the range-wide GS-G habitat connectivity analysis is a raster-based GIS application that links land cover and topographic data with disturbances and land use. The analysis determines the current location of the GS-G habitat patches and evaluates the level of connectivity, or conversely fragmentation, in these patches within a large regional area, at a 30 meter minimum cell size. The open-architecture structure of the model incorporates very large data sets from a wide variety of existing sources. Model inputs meet a fundamental requirement that they cover the entire analysis area to avoid data "holes". The analysis is repeatable, thus

allowing for determination of change in the characteristics of the GS-G habitat patches over time. The overall structure of the analysis model is illustrated by the flowchart in Figure 1. On one side of the overall model is a *GS-G habitat sub-model* that corresponds to the GS-G habitat features on the landscape. On the other side is a series of disturbance related components that make up the *overall disturbance sub-model*. Disturbance components are features that affect or influence the GS-G and habitat. Construction of each submodel requires extensive interaction between the GIS modeler and scientists knowledgeable of GS-G habitat preferences, home range, movements, and habitat use patterns in the region. Once the GS-G habitat and overall disturbance components are constructed they are combined into a GS-G habitat sub-model and the overall disturbance sub-model, respectively. The scored results from both sub-models are integrated on a cell-by-cell basis to form the GS-G habitat connectivity model. GS-G habitat core areas and relative isolation metrics are derived from the associated output.
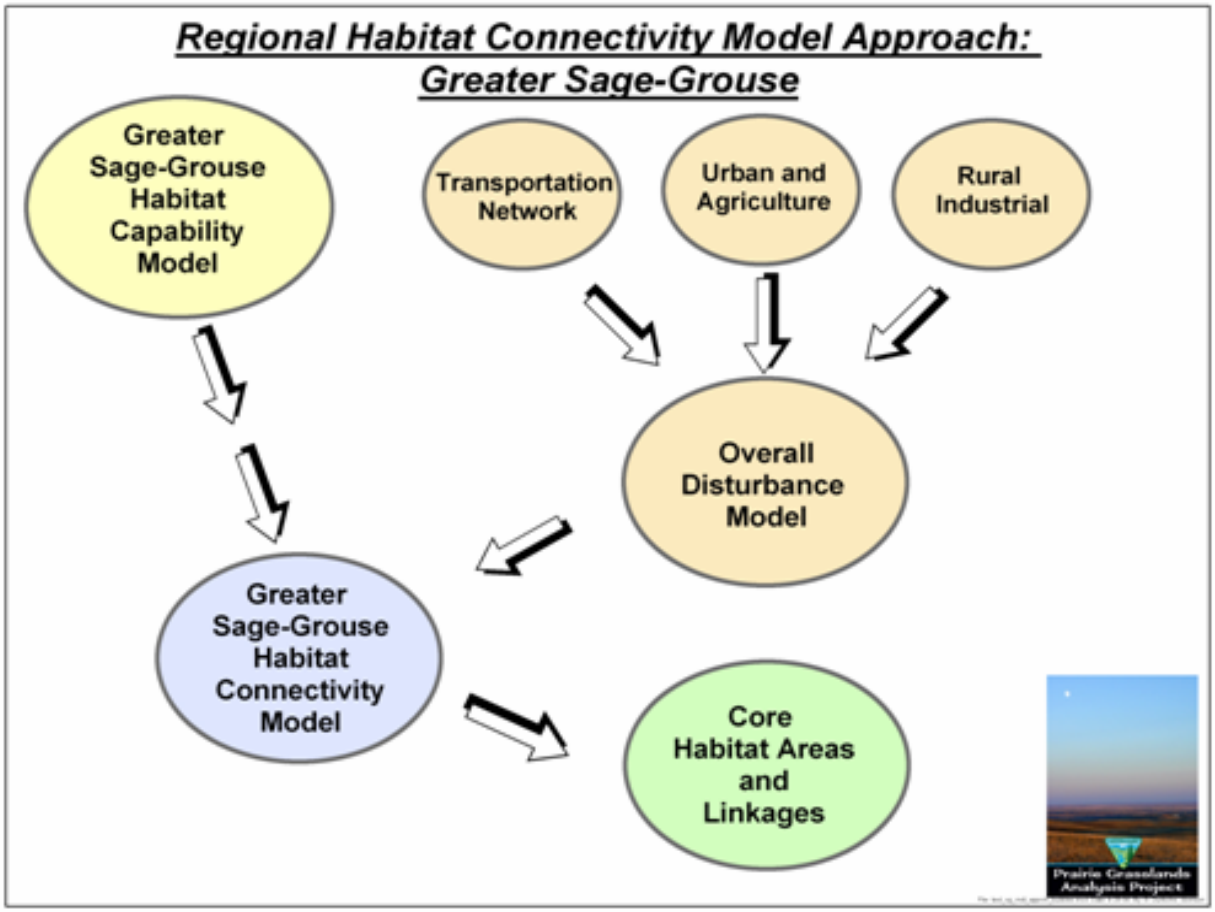
Figure 1. Simplified depiction of regional habitat connectivity/fragmentation analysis approach featuring greater sage-grouse as the focal species.