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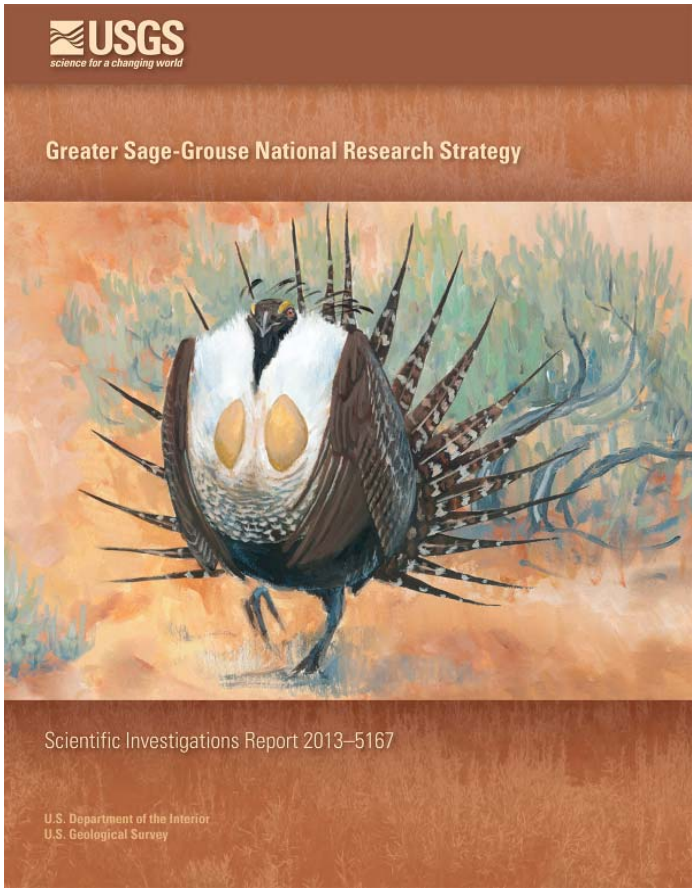
Greater Sage-Grouse National Research Strategy



Available at http://pubs.usgs.gov/sir/2013/5167

Background

The condition of the sagebrush ecosystem has been declining in the Western United States, and greater sage-grouse (*Centrocercus urophasianus*), a sagebrush-obligate species, has experienced concurrent decreases in distribution and population numbers. This has prompted substantial research and management to improve the understanding of sage-grouse and its habitats and to address observed decreases in distribution and population numbers. The amount of research and management has increased as the year 2015 approaches, which is when the U.S. Fish and Wildlife Service is expected to decide whether or not to protect the species under the Endangered Species Act.

The U.S. Geological Survey (USGS) undertook the development of the Greater Sage-Grouse National Research Strategy (Research Strategy) to addresses information and science relating to the greater sage-grouse and its habitat across portions of 11 western states. This Research Strategy provides an outline of important research topics to ensure that scientific information needed for planning, research, and resource management is identified and documented in a comprehensive manner. Further, by identifying priority topics and critical information needed for planning, research, and resource management, the Research Strategy provides a structure to help coordinate members of an expansive research and management community in conducting priority research.

How the USGS Became Involved

In 2012, the Sage-Grouse Executive Oversight Committee of the Western Association of Fish and Wildlife Agencies requested that the USGS lead the development of the Research Strategy. This request was motivated by a practical need to systematically connect existing research and conservation plans with persisting or emerging information needs. Managers and researchers also wanted to reduce redundancy and help focus limited funds on the highest priority research and management issues.

A Four-Step Process

- Research needs, questions, ideas, and uncertainties about sage-grouse populations, sagebrush habitats, and change agents were identified by conducting a thorough review of national and state conservation assessments, plans, and strategies (Table 1).
- Research questions were categorized into themes and topics.
- Topics were prioritized using a focus group of representatives from federal and state agencies (Table 2).
- The written report was drafted by USGS staff, followed by collegial review, peer review, and revision. The review and approval of the final publication was consistent with USGS Fundamental Science Practices.

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Table 1. Conservation and management documents reviewed to identify research needs and management issues.

Citation	Title
Wyoming Sage-Grouse Working Group, 2003	Wyoming greater sage-grouse conservation plan
Nevada Sage-Grouse Conservation Team, 2004	Greater sage-grouse conservation plan for Nevada and eastern California
Stinson and others, 2004	Washington state recovery plan for the greater sage-grouse
Montana Sage Grouse Work Group, 2005	Management plan and conservation strategies for sage grouse in Montana – Final
McCarthy and Kobriger, 2005	Management plan and conservation strategies for greater sage-grouse in North Dakota
Stiver and others, 2006	Greater sage-grouse comprehensive conservation strategy
Idaho Sage-Grouse Advisory Committee, 2006	Conservation plan for the greater sage-grouse in Idaho
South Dakota Department of Game, Fish, and Parks, 2008	Greater sage-grouse management plan South Dakota 2008–2017
Colorado Greater Sage-Grouse Steering Committee, 2008	Colorado greater sage-grouse conservation plan
Utah Division of Wildlife Resources, 2009	Utah greater sage-grouse management plan
Stiver and others, 2010	Sage-grouse habitat assessment framework
Hagen, 2011	Greater sage-grouse conservation assessment and strategy for Oregon: A plan to maintain and enhance populations and habitat
Knick and Connelly, 2011	Greater sage-grouse: Ecology and conservation of a landscape species and its habitats
Sage-grouse National Technical Team, 2011	A report on national greater sage-grouse conservation measures
U.S. Department of the Interior, 2012	Sage-grouse conservation objectives draft report
Range-wide Interagency Sage-Grouse Conservation Team, 2012	Near-term greater sage-grouse conservation action plan
Manier and others, 2013	Summary of science, activities, programs and policies that influence the range-wide conservation of greater sage-grouse

Table 2. Strategic sage-grouse research framework.

Sage-Grouse Biology

- Develop spatially explicit population models that incorporate the complexities of biological processes and dynamic habitats and derive scenarios that reflect local management to support planning decisions.
- Determine links among functional connectivity (intermixing of birds), habitat conditions, and habitat configuration using genetic evidence and sage-grouse movement patterns.
- Develop options for a unified approach for monitoring sage-grouse across its range and within multiple periods of its life cycle.

Habitat Management

- Determine links between multi-scale habitat condition and configuration and sage-grouse population processes.
- Inform site-level management, restoration, mitigation, and rehabilitation activities through integrated study of restoration practices, ecosystem succession, recovery rates, ecosystem function, and environmental covariates.
- Determine the components of habitat suitability that affect the ability of individual sage-grouse to move through the landscape and populations to mix.

Change Agents

- Determine the effects of loss of habitat and the ecological influence of new or altered landscapes due to surface disturbance on sage-grouse behavior and population characteristics.
- Examine the effects of conifer encroachment on sagebrush, and the effectiveness of management treatments to restore functioning sage-grouse habitat in areas where encroachment occurs.
- Develop new practices or improve existing practices to reduce or eliminate the spread of invasive species and to restore sagebrush that is affected by invasive plant species.
- Assess fire history and fire-recovery rates in a way that informs planning efforts and deployment of resources for future fire events, improve the understanding of effective post-fire restoration methods, and link these to sage-grouse population and behavioral data to increase understanding of the response of sage-grouse to fire.
- Determine the influence of herbivory, including grazing by domestic livestock and wild horses, burros, and ungulates, on sage-grouse populations and habitat conditions, and develop options that minimize negative outcomes.