Dynamics Of Sage Grouse Centrocercus Urophasianus Populations

Habitat Requirements and Management Recommendations for Sage Grouse
Rangeland Sustainability
Greater Sage-grouse Ecology, Chick Survival, and Population Dynamics, Parker Mountain, Utah
Effects of Agricultural Conservation Practices on Fish and Wildlife
Landscape-scale Factors Affecting Population Dynamics of Greater Sage-grouse (Centrocercus Urophasianus) in North-central Montana, 2001-2004
Alturas Field Office
Ecology, Conservation, and Management of Grouse
Riparia
Spatial and Temporal Changes of Sage Grouse Habitat in the Sagebrush Biome
Enabling Sustainable Energy Transitions
Greater Sage-Grouse Response to Coal-bed Natural Gas Development and West Nile Virus in the Powder River Basin, Montana and Wyoming, USA
Proceedings RMRS.
Acoustic Communication in the Greater Sage-Grouse (Centrocercus Urophasianus) an Examination Into Vocal Sacs, Sound Propagation, and Signal Directionality
Biology: The Dynamic Science
Greater Sage-Grouse
State and Local Efforts to Protect Species, Jobs, Property, and Multiple Use Amidst a New War on the West Part 1 and 2
Ely Energy Center Project
Greater Sage-Grouse
Animal Behavior After Translocation into Novel Environments
Mediated Modeling

Modeling Sage-grouse Habitat Using a State-and-transition Model
Wildlife Management and Conservation
Summary of science, activities, programs, and policies that influence the rangewide conservation of greater sage-grouse (Centrocercus urophasianus)
A Large-scale Multi-seasonal Habitat Prioritization and an Analysis of Structural Connectivity for the Conservation of Greater Sage-grouse in Wyoming
Ecology, Conservation, and Management of Grouse
Cumulative Effects in Wildlife Management
Operationalizing the Concepts of Resilience and Resistance for Managing Ecosystems and Species at Risk
Factors Related to Success and Participants09 Psychological Ownership in Collaborative Wildlife Management
Technical Note
Prescribed Fire Effects on Vegetation and Arthropod Dynamics, and Sampling Techniques in a Wyoming Big Sagebrush Community
Ecology and Conservation of Lesser Prairie-Chickens
Sage-Grouse Habitat Restoration Symposium Proceedings
Bridger-Teton National Forest (N.F.), Off-highway Vehicle Route Designation Project
The North American Grouse: Their Biology and Behavior
Factors Affecting Greater Sage-grouse (Centrocercus Urophasianus) Survival and Movement in South-central Utah
Quantifying Habitat Importance for Greater Sage-grouse (Centrocercus Urophasianus) Population Persistence in an Energy Development Landscape
Effects of Agricultural Conservation Practices on Fish and Wildlife
The Leading Edge of the Big Sagebrush Distribution
This Land
Atlantic Rim Natural Gas Field Development Project

SHANNON SELLERS

Habitat Requirements and Management

Recommendations for Sage Grouse Univ of California Press
'Mediated Modeling' is an approach to participatory environmental decision-making. It uses system dynamics models in a public setting to enable participants to learn about and see the consequences of various possible decision paths for their

communities and ecosystems.

Rangeland Sustainability Frontiers Media SA

"This compact book argues that ideas about accountability and legitimation - drawn from work on environmental governance - can open up new analytical perspectives on what is holding back effective energy system transformation. With bite-size chapters and illustrative cases that draw on the work of five expert witnesses, this is a novel intervention into debates over the politics of energy transition."--Professor Gavin Bridge, Durham University, UK "The book theorizes and advances the research frontier on legitimation practices and accountability with a carefully crafted analysis bridging scholarly fields of environmental governance, political economy, energy research and democratic theory. It is a must-read for all students and scholars interested in shaping more legitimate, democratic and accountable energy transition from the local to global context." - Professor Karin Bäckstrand, Stockholm University, Sweden This open access book reframes sustainable energy transitions as being a matter of resolving accountability crises. It demonstrates how the empirical study of several practices of legitimation can analytically deconstruct energy transitions, and presents a typology of these practices to help determine whether energy transitions contribute to sustainability. The real-world challenge of climate change requires sustainable energy transitions. This presents a crisis of accountability legitimated through situated practices in a wide range of cases including: solar energy transitions in Portugal, urban energy transitions in Germany, forestland conflicts in Indonesia, urban carbon emission targets in Norway, transport electrification in the Nordic region, and biodiversity conservation and energy extraction in the USA. By synthesising these cases, chapters identify various dimensions wherein practices of legitimation construct specific accountability relations. This book deftly illustrates the value of an analytical approach focused on accountable governa nce to enable sustainable energy transitions. It will be of great use to both academics and practitioners working in the field of energy transitions. Siddharth Sareen is a postdoctoral researcher at the Centre for Climate and Energy Transformation at the University of Bergen, Norway.

Greater Sage-grouse Ecology, Chick Survival, and Population Dynamics, Parker Mountain, Utah JHU Press

Landscapes undergoing intensive energy extraction activities present challenges to the persistence of wildlife populations. Much of the oil and gas resources in western North America, underlie sagebrush (Artemisia spp.) ecosystems. The greater sage-grouse (Centrocercus urophasianus) is a sagebrush obligate that is dependent on this ecosystem for its entire life-cycle. I developed research objectives to: 1) spatially quantify habitat quality for female greater sage-grouse during the reproductive period in the Atlantic Rim Project Area (ARPA) of south-central, Wyoming, which was being developed for coalbed natural gas (CBNG) resources, 2) utilize a non-impacted offsite reference area (Stewart Creek [SC]) to assess factors potentially contributing to changes in habitat quality resulting from energy development during the nesting period, and 3) explore microhabitat conditions that were crucial to female greater sage-grouse reproduction. In a geographic information system (GIS) framework, I quantified habitat quality for greater sage-grouse in the ARPA by generating

a suite of habitat-specific environmental and anthropogenic variables at three landscape scales. My results showed that environmental and anthropogenic variables at multiple spatial scales were predictive of female greater sage-grouse occurrence and fitness. Anthropogenic variables related to CBNG development were predictive in all of the final occurrence models, suggesting that anthropogenic features were resulting in habitat avoidance through all summer life-stages. My fitness modeling illustrated habitat-specific and scale dependent variation in survival across the ARPA landscape. When mapped, the final ecological model identified habitat patches that were contributing the most to population persistence and that source-sink dynamics within the ARPA landscape may be shifting as a result of CBNG development. Documenting an anthropogenic impact that has already occurred yields limited inference unless a means of comparison is incorporated. I evaluated habitat and demographic responses of greater sage-grouse during nesting by comparing an energy development landscape (ARPA) to a non-impacted landscape (SC). I accomplished this by spatially shifting my nest occurrence and survival models from the ARPA to SC. In addition, I compared nest survival rates between the areas. My nest occurrence and survival models were predictive in SC without the CBNG predictor variable. Specific environmental variables that were robust predictors of nest occurrence in both areas included big sagebrush canopy cover and litter that represented dead standing woody vegetation and detached organic matter both at a 0.25-km2 scale. Further, the variability in shrub heights at a 1.0-km2 scale at was highly predictive of nest survival in both areas. The evidence of the predictive ability of my nest occurrence models in SC and the habitat likeness between areas allowed me to assess what greater sage-grouse nest selection in the ARPA might have looked like prior to the introduction of CBNG development by replacing time (pre-development data) with space (using SC as a spatial control). I modeled the ARPA RSF against the SC nest occurrence data (i.e., nest selection in the absence of CBNG development) and then spatially shifted the adjusted model back to the ARPA. However, the range of variability in habitat conditions between the ARPA and SC caused the spatial shifting of the models to function poorly in practice. This elucidates an important consideration in choosing spatial control related habitat variability and the predictive errors associated with extrapolation out of the range of the data used to train the RSF. Thus for a spatial control to function well, not only do habitat conditions need to be similar to the impacted area but the range of variability in habitat conditions need to also be comparable. Understanding habitat selection at macrohabitat and microhabitat scales is critical to conserving and restoring greater sage-grouse habitat. Because of the similar ecological conditions, my microhabitat selection analysis for the greater sage-grouse during the nesting, early and late brood-rearing periods incorporated both the ARPA and SC. Nest microhabitat selection was positively correlated with mountain big sagebrush (A. tridentata vaseyana) and litter cover. I found that female greater sage-grouse preferred areas with greater sagebrush cover and greater perennial grass cover during early and late brood-rearing. However, I did not find forb cover to be predictive of early or late brood-rearing occurrence. My findings suggest that sage-grouse inhabiting xeric sagebrush

habitats (less than 25 cm annual precipitation) rely on sagebrush cover and grass structure for nesting as well as brood-rearing and that these structural characteristics may be more important than forb availability at the microhabitat scale. (Abstract shortened by UMI.)

Effects of Agricultural Conservation Practices on Fish and Wildlife

Univ of California Press

Habitat for wildlife species that depend on sagebrush ecosystems is of great management concern. Evaluating how management activities and climate change may affect the abundance of moderate and high-quality habitat necessitates the development of models that examine vegetation dynamics, but modeling tools for rangeland systems are limited. I developed state-and-transition models using a combination of scientific literature and data for climate, soils, and wildfire to examine how different types of natural events, management activities, changing climate, and potential future vegetation dynamics may interact and affect the abundance of habitat for the greater sage-grouse (Centrocercus urophasianus). Specific periods examined include the era prior to 1850, the current era, and late in the 21st century in southeastern Oregon. A primary purpose of this study was to evaluate the use of climate data to define most event probabilities and, subsequently, the relative mix of ecological states, community phases, and sage-grouse habitat with an eye towards a modeling approach that was objective, repeatable, and transferrable to other locations. Contrary to expectations, model results of the conditions prior to 1850 indicated fire may not have been the most important disturbance factor influencing sage-grouse habitat abundance, merely the most visible. Other, more subtle disturbances that thinned sagebrush density, such as drought, herbivory, and weather-related mortality, may have been equally or more important in shaping sage-grouse habitat. Sage-grouse breeding habitat may have been slightly more abundant than levels currently recommended by sage-grouse biologists, brood-rearing habitat may have been as or more abundant, but wintering habitat may have been less abundant. Under the current conditions, livestock grazing during severe drought, postfire seeding success, juniper expansion probabilities, and the frequency of vegetation treatments were the most important determinants of sage-grouse habitat abundance. The current vegetation trajectory would lead to considerably less nesting, brood-rearing, and wintering habitat than sage-grouse biologists recommend. Model results suggested reducing or eliminating livestock grazing during severe drought, increasing postfire seeding success, and treating at least 10% of the so-called expansion juniper each year was necessary to maintain higher levels of sage-grouse habitat, although nesting and brood-rearing habitat remained in short supply. I examined three potential future climates based on long-term climate trends in southeastern Oregon and modeled climate and ecosystem projections for the Pacific Northwest generally. The first scenario produced warmer and drier conditions than present, the second scenario warmer and wetter conditions in winter, and the third scenario warmer and wetter conditions in summer. The implications for sage-grouse habitat abundance were very different between these three scenarios, but all would likely result in the loss or near complete loss of cooler, moister sagebrush communities important for nesting and brood-rearing.

Salt desert shrub and warmer, drier sagebrush communities could expand under the first scenario but would have a high risk of displacement by cheatgrass. Juniper woodlands could increase in density and salt desert shrub may expand slightly under the second scenario. The remaining sagebrush communities would remain at high risk of displacement by cheatgrass. Pinyon-juniper woodland could largely displace sagebrush in the third scenario. Sage-grouse habitat quality likely would decline in all three scenarios and the abundance decrease significantly in the second and third scenario.

Landscape-scale Factors Affecting Population Dynamics of Greater Sage-grouse (Centrocercus Urophasianus) in North-central Montana, 2001-2004 Univ of California Press

The thesis is an inquiry into the acoustic communication of a very unusual avian species, the Greater Sage-Grouse, Centrocercus urophasianus. One of the most outstanding features of this animal's dynamic mating display is its use of paired air sacs that emerge explosively from an esophageal pouch. My first line of inquiry into this system is a review of the form and function of similar vocal apparatuses, collectively called vocal sacs, in birds. Next, with a combination of mathematical models and field measurements, My collaborator and I investigate the acoustic environment where the Greater Sage-Grouse display. The complexities of this acoustic environment are relevant both to the birds and to the subsequent examinations of the display's properties. Finally, my collaborators and I examine a cryptic component of the acoustic display --- directionality --- which we measured simultaneously from multiple locations around free moving grouse on their mating grounds.

Alturas Field Office Penguin

Habitat loss is widely recognized as the primary cause of global declines in biodiversity and is linked to human disturbances through widespread land-use changes (Menon et al., 2001). As a consequence, wildlife species must persist on landscapes that are greatly modified and fragmented (Moilanen et al., 2005). Disruptions affecting the structural connectivity can hinder ecological flows of energy, nutrients and the natural dispersal of species across the landscape. Therefore, in order to conserve wildlife populations, we are challenged with securing areas where species are most likely to survive in the long run while maintaining habitat connectivity to facilitate natural ecological processes and meta-population dynamics (Gardner et al., 1993; Early and Thomas, 2007). Identifying conservation priority areas is an essential step in wildlife conservation planning. In order to achieve long term conservation success amid increasing developments and environmental degradation, we must aim for biologically and ecologically comprehensive and justifiable approaches that take multiple factors into consideration when defining conservation priority areas. In addition, when prioritizing the landscape, we must also account for the variations in habitat use caused by seasonal changes throughout the annual cycle in order to protect indispensable habitat across all seasons and life-stages. Thus, my first objective was to develop an annual habitat prioritization for greater sage-grouse (Centrocercus urophasianus; hereafter sage-grouse) in Wyoming, USA by combining nesting, summer and winter habitat selection models in an ecologically meaningful way using a quantitative spatial prioritization tool. I assessed the capacity of Wyoming's current

sage-grouse protected areas for capturing priority areas across the full annual cycle in order to quantify the importance of a multi-seasonal (i.e., annual) habitat prioritization. While, the annual habitat prioritized substantial as well as very similar fractions of the best habitat from each individual season, results indicated that the protected areas did not account for 52% of the top 25% of best annual habitat. As expected, the individual seasonal analysis confirmed that the protected areas contained more nesting priority habitat and failed to capture substantial fractions of summer and winter priority habitat. My second objective was to model connectivity between sage-grouse lek sites by applying circuit theory across the annual habitat model. I calculated the correlation between connectivity and habitat use across the annual and nesting habitat selection models to test if greater connectivity resulted in larger and more stable populations independent of habitat. I examined these trends across years of high population as well as years of low population. The structural connectivity of the landscape was not strongly correlated with the relative probability of habitat use across both nesting and annual habitat models (r = 0.3). Increasing connectivity was associated with increasing population sizes at leks and decreasing variability in lek counts; thus signifying that structural connectivity has a positive influence on population abundance and supports greater stability at lek sites. These trends also extended across years of high population as well as years of population declines, therefore indicating the importance of structural connectivity across the full cycle. Overall, my research explicitly integrates across all seasonal habitats supporting a multi-seasonal approach over a single-season approach for identifying priority areas in order to shield sage-grouse from human induced disturbances across the full annual cycle. Furthermore, I found that the structural connectivity of the landscape is beyond a simple summarization of habitat availability; therefore, when prioritizing the landscape and identifying core areas for protection, considering areas of high structural connectivity in addition to good quality habitat would enhance overall conservation outcomes across the full annual cycle.

Ecology, Conservation, and Management of Grouse Elsevier

Russell/Hertz/McMillan, BIOLOGY: THE DYNAMIC SCIENCE 4e and MindTap teach Biology the way scientists practice it by emphasizing and applying science as a process. You learn not only what scientists know, but how they know it, and what they still need to learn. The authors explain complex ideas clearly and describe how biologists collect and interpret evidence to test hypotheses about the living world. Throughout, Russell and MindTap provide engaging applications, develop quantitative analysis and mathematical reasoning skills, and build conceptual understanding. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Riparia Island Press

"The book contains the essential information that wildlife biologists and managers use to manage wildlife populations today, and it gives students the information they need to pursue a profession in wildlife management and conservation"--

Spatial and Temporal Changes of Sage Grouse Habitat in the Sagebrush Biome CRC Press

Grouse—an ecologically important group of birds that include capercaillie, prairie chickens, and ptarmigan—are distributed throughout the forests, grasslands, and tundra of Europe, Asia, and North America. Today, many grouse populations are in decline, and the conservation and management of these charismatic birds is becoming a global concern. This volume summarizes current knowledge of grouse biology in 25 chapters contributed by 80 researchers from field studies around the world. Organized in four sections—Spatial Ecology, Habitat Relationships, Population Biology, and Conservation and Management—the chapters offer important insights into spatial requirements, movements, and demography of grouse. Much of the research employs emerging tools in ecology that span biogeochemistry, molecular genetics, endocrinology, radio-telemetry, and remote sensing. The chapters explore topics including the impacts of climate change, energy development, and harvest, and give new evidence for life-history changes in response to human activities.

Enabling Sustainable Energy Transitions Cengage Learning

Understanding how population dynamics respond to landscape-scale disturbance and disease are crucial for effective wildlife management and conservation. Two new potential stressors on greater sage-grouse (Centrocercus urophasianus) populations in the Powder River Basin of Montana and Wyoming are coal-bed natural gas (CBNG) development and West Nile virus (WNv). I first examined how CBNG development, habitat, and other landscape features influenced trends in the abundance of displaying males and the status of sage-grouse leks. Second, I used rates of WNv-induced mortality and seroprevalence from radio-marked birds to estimate rates of WNv infection. Third, I studied the influence of female characteristics, season, and environmental variables on nest, brood, and female survival. I then used population models to estimate potential impacts of WNv on population growth. From 2001-2005, numbers of males on leks in CBNG fields declined more rapidly than leks outside CBNG. Of leks active in 1997 or later, only 38% within CBNG remained active by 2004-2005, compared to 84% of leks outside CBNG. By 2005, leks in CBNG had 46% fewer males per active lek than leks outside CBNG. Persistence of 110 leks was positively influenced by proportion sagebrush habitat within 6.4 km of the lek and negatively affected by CBNG development at multiple scales. Prohibiting CBNG development within 0.4 km of sage-grouse leks is inadequate to ensure lek persistence. From 2003-2005, minimum WNv-related mortality rates from 1 July-15 September ranged from 2.4-13.3% and maximum possible rates ranged from 8.2-28.9%. In spring 2005 and 2006, 10.3% and 1.8% respectively, of newly-captured females tested seropositive for neutralizing antibodies to WNv. Annual WNv infection rates were lower in habitats without CBNG development. Summer mortality from WNv occurred every year, decreased annual female survival rates by 0-27% per year, and reduced estimates of population growth by 7-10% per year. Changes in epizootiology of WNv and in distribution and management of surface water from CBNG development will play an important role in long-term impacts of WNv on greater sage-grouse populations in the Powder River Basin. Management should focus on eliminating man-made water sources that support breeding mosquitos known to vector the virus.

Greater Sage-Grouse Response to Coal-bed Natural Gas Development and West Nile Virus in the Powder River Basin, Montana and Wyoming, USA CRC Press
"This Technical Note is primarily a review of literature on the fundamental habitat requirements of sage grouse and habitat management methods that may be used to perpetuate the species. It does not reiterate the life history, past distribution, species characteristics, and population dynamics"--Page 1.
Proceedings RMRS. Lulu.com
Greater sage-grouse (Centrocercus urophasianus) adult and juvenile survival have been identified as critical demographic parameters. However, little is known regarding the dynamics of juvenile sage-grouse. From 2008-2010, I used radio-telemetry and 2 transmitter types to monitor 91 juvenile sage-grouse. Program MARK was used to analyze survival data. Over-winter survival was 0.802 - 0.982 and 0.687 - 0.969 for females and males, respectively. Fall survival rates were 0.522 - 0.623 for females and 0.332 - 0.449 for males. Survival from fall through winter was 0.418 - 0.616 for females and 0.228 - 0.435 for males. For both years combined, the probability predation caused death was 0.705, and probability harvest caused death was 0.159. The probability unreported harvest caused death was 0.091. Sex (p= 0.103) and transmitter type (p = 0.09) affected survival. Back-mounted transmitters negatively affected survival and their use should be avoided to minimize experimental bias. Sage-grouse age and breeding status may affect susceptibility to harvest. Radiotelemetry data collected from 1998-2009, maximum likelihoods, and profile likelihood confidence intervals ([alpha] = 0.1) were used to assess hen harvest risk by breeding status. The probability of harvest was 0.087 (0.035-0.171) and 0.011 (0.001-0.039) for brood hens and non-brood hens, respectively. More research is needed to determine the acceptable harvest rates for juvenile and adult hen sage-grouse. Future harvest management actions should attempt to shift harvest away from juveniles and the hens associated with them. Sage-grouse are dependent on sagebrush (Artemisia spp.) during winter months. Impacts to wintering areas could have a disproportionate effect on population size. On Parker Mountain, sage-grouse used winter habitats characterized by 0-5% slopes regardless of aspect and slopes 5-15% south to west in aspect. The timing of movements to wintering areas varied between years. In 2008 movements occurred rapidly during November, whereas in 2009 movements were slow and meandering beginning in late September and continuing through November. A vast majority of significant winter use (areas with kernel density estimates of>.94 locations per km2) was on a small percentage, 3%, of the available habitat. Some critical wintering areas may not be readily identifiable in typical years.

Acoustic Communication in the Greater Sage-Grouse (Centrocercus Urophasianus) an Examination Into Vocal Sacs, Sound Propagation, and Signal Directionality CRC Press
"The bibliography is a guide to recent scientific literature covering effects of agricultural conservation practices on fish and wildlife. The citations listed here provide information on how conservation programs and practices designed to improve fish and wildlife habitat, as well as those intended for other purposes (e.g., water quality improvement), affect various aquatic and

terrestrial fauna"--Abstract.

Biology: The Dynamic Science Univ of California Press

"The bibliography is a guide to recent scientific literature covering effects of agricultural conservation practices on fish and wildlife. The citations listed here provide information on how conservation programs and practices designed to improve fish and wildlife habitat, as well as those intended for other purposes (e.g., water quality improvement), affect various aquatic and terrestrial fauna"--Abstract.

Greater Sage-Grouse Springer Nature

Summarizing current knowledge of grouse biology, this volume is organized in four sections--spatial ecology, habitat relationships, population biology, and conservation and management--and offers insights into spatial requirements, movements, and demography of grouse. Much of the research employs emerging tools in ecology that span biogeochemistry, molecular genetics, endocrinology, radio-telemetry, and remote sensing.--Adapted from publisher description on back cover.

State and Local Efforts to Protect Species, Jobs, Property, and Multiple Use Amidst a New War on the West Part 1 and 2 Frontiers Media SA

"Here's everything one needs to know about sage-grouse, but it's much more than that. From the probing analyses of sage-grouse biology, one gains a broader understanding the ecology and conservation imperatives of sagebrush habitats throughout the West."—John A. Wiens, Chief Conservation Science Officer, PRBO Conservation Science "The threats facing Sage-grouse and the sagebrush habitats of the West are as vast as the landscape itself. Anyone’s foray into confronting this monumental conservation challenge should begin in the pages of this book.”-Ben Deeble, Sagebrush-Steppe Project Leader

Ely Energy Center Project

Big sagebrush (Artemisia tridentata) is endemic to semiarid western North America. Big sagebrush plant communities are important for recreating and grazing but are also essential habitat for many plant and animal species including the greater sage-grouse (Centrocercus urophasianus). Recent predictions suggest that climatic suitability for big sagebrush under future climate change will increase along the northeastern edge of the existing big sagebrush distribution or the predicted leading edge. The main objective of my research was to characterize big sagebrush plant communities adjacent to the leading edge of the distribution using both field and modeling studies. I used a field study to characterize the established plant community and the seed bank in plant communities adjacent to the leading edge. I quantified the plant community composition, soil texture, and cover as well as the seed bank for 3 sites in northeastern Montana, USA. I also used a paired soil water and individual plant model (STEPWAT) to assess big sagebrush plant community response to climate change. I ran simulations under current and future climate conditions for mid and late-century predictions using 10 Global Circulation Models (GCMs) for 10 sites adjacent to the predicted leading edge of the big sagebrush distribution. In big sagebrush plant communities adjacent to the leading edge, there was less than 30% similarity in the relative abundance of species between the established plant community and the seed bank. This difference was primarily driven by an overrepresentation of annual forbs and an underrepresentation of

big sagebrush in the seed bank compared to the established plant community. Simulations of big sagebrush plant communities adjacent to the leading edge showed no substantial change in plant community functional type composition under future climate for mid and late-century time periods. Sagebrush and total biomass decreased in the future but, depending on the scenario and GCM, there was a wide range of potential biomass values for all functional groups varying in direction of change and amplitude. These results support future predictions of no change in climatic suitability for big sagebrush plant communities adjacent to the leading edge. Current big sagebrush plant communities adjacent to the leading edge appear to be able to respond well to climate change. These communities could support big sagebrush range expansion into the leading edge given the availability of seeds. My work will help inform the management of these communities under future climate change.

Greater Sage-Grouse

Admired for its elaborate breeding displays and treasured as a game bird, the Greater Sage-Grouse is a charismatic symbol of the broad open spaces in western North America. Unfortunately these birds have declined across much of their range—which stretches across 11 western states and reaches into Canada—mostly due to loss of critical sagebrush habitat. Today the Greater Sage-Grouse is at the center of a complex conservation challenge. This multifaceted volume, an important foundation for developing conservation strategies and actions, provides a comprehensive synthesis of scientific information on the biology and ecology of the Greater Sage-Grouse. Bringing together the experience of thirty-eight researchers, it describes the bird’s population trends, its sagebrush habitat, and potential limitations to conservation, including the effects of rangeland fire, climate change, invasive plants, disease, and land uses such as energy development, grazing, and agriculture.

Animal Behavior After Translocation into Novel Environments

As humans continue to encroach on wildlands, quality and quantity of wildlife habitat decreases before our eyes. A housing development here, a shopping mall there, a few more trees cut here, another road put in there, each of these diminishes available habitat. Unless the cumulative effects of multiple simultaneous development projects are recognized and incorporated at the beginning of project development, we will continue to see wildlife habitat disappear at unprecedented rates. Divided into two parts, Cumulative Effects in Wildlife Management emphasizes the importance of recognizing cumulative effects and highlights the necessity of their bearing on future policy. It begins with an outline of the differences between direct, indirect, and cumulative effects of anthropogenic impacts on wildlife habitat and addresses the similarities and differences in US and Canadian policies, legal and economic ramifications, and the confusion that stems from lack of consideration, communication, and forward planning. Section 1 also describes the current standard means of quantifying cumulative effects as proposed by the Council on Environmental Quality. Section 2 presents a series of case studies that deepen our appreciation of how anthropogenic influences interconnect and how this heightened level of understanding influences our ability to make informed decisions. Case studies include cumulative effects in the Canadian Arctic, border issues with

Mexico, suburban and exurban landscapes, scenic resources, and the cumulative impacts of energy development on sage-grouse. Without a conscious knowledge of what is happening around us, we will not be able to incorporate an effective land ethic, and natural resources will be the ultimate loser. Cumulative Effects in Wildlife Management brings to light the crucial connections between human expansion and habitat destruction for those managers and practitioners charged with protecting wildlife in the face of changing landscapes.

Mediated Modeling

This book describes the underlying water conditions and geologies that support viable riparia, illustrates the ecological characteristics of riparia, and discusses how riparia are used by human cultures as well as how riparia can be used to sustain environmental quality. In recent years riparian management has been widely implemented as a means of improving fisheries, water quality, and habitat for endangered species. This book provides the basic knowledge necessary to implement successful, long-term management and rehabilitation programs. Treats riparian patterns & processes in a holistic perspective, from ecological components to societal activities Contains over 130 illustrations and photos that summarize this complex ecological system Synthesizes the information from more than 6,000 professional articles Sidebars provide a look into ongoing research that is at the frontiers of riparian ecology and management