

I. EXECUTIVE SUMMARY

The Gunnison Sage-grouse Rangewide Conservation Plan is the culmination of almost 2 years of effort by the Rangewide Steering Committee and others. Yet in many ways, it is a continuation of a conservation planning process that began almost as soon as a Ph.D. student named Jessica Young verified her and other biologists' suspicions that the sage-grouse in Gunnison, adjacent areas in southwest Colorado, and a portion of southeast Utah were different than sage-grouse further north. Although not officially designated as a new species by the American Ornithologists' Union until 2000, the first local work group was formed in the Gunnison Basin in 1995, and their plan completed in 1997. Other local work groups quickly followed suit; local plans were completed for Crawford, Dove Creek and the San Miguel Basin populations in 1998, and for the Monticello (Utah), Piñon Mesa, and Poncha Pass populations in 2000.

This Rangewide Conservation Plan is intended to supplement local plans, and to offer a rangewide perspective, so as to ensure that the cumulative result of conserving local populations is conservation of the species. It is intended as guidance to aid in the Gunnison sage-grouse conservation efforts of federal land management agencies, various industry groups, the Colorado Division of Wildlife, and the Utah Division of Wildlife Resources, as well as local work groups. While we hope and trust that it will serve as a blueprint for management actions by these groups and others, and as a catalyst for increased attention and action, it is not a legal document, a regulatory document, a Recovery Plan under the Endangered Species Act (ESA), nor a NEPA (National Environmental Policy Act) decision document. Representatives of the U.S. Forest Service, Bureau of Land Management, National Park Service, and Fish and Wildlife Service participated in the preparation of this plan, but these agencies will consider this guidance as well as other information following established public participation protocols when preparing decision documents under NEPA or the ESA.

We include substantial information on Gunnison sage-grouse that was not available to local work groups when their plans were developed, such as new information on biology, genetic diversity, habitat use, population estimation, and a population viability analysis. We analyzed the capability of habitats to support grouse, and evaluated threats to local populations. For these reasons we strongly suggest local work groups review the Rangewide Conservation Plan in its entirety, update their local plans, and adopt the conservation strategies proposed in order to meet or exceed population and habitat target ranges identified.

A guiding philosophy of this plan is that conservation works best when implemented at the most local level possible. Maintaining sustainable local economies will in the long run be the most cost-effective and socially acceptable means to conserve Gunnison sage-grouse. It was our intent that this plan would provide the scientific basis upon which local and rangewide conservation efforts could be based.

Gunnison sage-grouse occupy a small fraction of their historical range, having been extirpated by habitat conversion from much of their presumed historical distribution in southwest Colorado, southeast Utah, northeast Arizona, and northern New Mexico. Distribution was probably always somewhat fragmented, but fragmentation has been greatly exacerbated by habitat loss. Currently (2004 data), we estimate approximately 3,200 breeding birds occur in 7 populations, approximately 2,400 of which occur in the Gunnison

Basin. Gunnison sage-grouse have relatively low genetic diversity compared to greater sage-grouse, and genetic information suggests most populations are isolated from each other.

Potential threats to Gunnison sage-grouse are varied, but numerous. Low genetic diversity, genetic drift from small population sizes, habitat issues (loss, degradation, and fragmentation from a variety of causes), the interaction of these with predator communities, and impacts of drought are the most significant threats facing Gunnison sage-grouse. Of these, by far the greatest threat is the permanent loss, and associated fragmentation and degradation of sagebrush habitat associated with urban development and/or conversion. We employed a spatially explicit model in an attempt to predict where most urban growth would occur between now and 2020, and evaluated parcel sizes as an index to short-term risk. The immediacy and extent of this threat varies from population to population and within subpopulations. Nevertheless, some level of land use planning, easements, fee-title acquisitions, or voluntary agreements not to develop private land, will be necessary in all populations.

A population viability analysis was conducted with *VORTEX* software as an aid to setting population size targets, and to determine which demographic parameters of sage-grouse influence population growth rates the most. *VORTEX* is a stochastic, individually based model, which means variability in survival and recruitment rates is incorporated. We also incorporated a severe drought into the model, which increased chick mortality over a 3-year period with a probability of occurrence of 1 in 100 years. Impacts of “normal” (less severe) droughts should be factored into the mean and variance of survival and recruitment rates used. The model suggested that chick mortality, followed by adult female mortality, most strongly influenced population growth rates. Relative extinction probabilities during a simulated 50-year period were very high for very small populations (less than 25 birds), and low (0 to 0.8%) for populations of 3,000 birds. Populations could only be considered “secure” (95% probability of persistence at stable growth rates) if they contained 500 or more individuals. Modeled loss of genetic diversity after 50 years was significant at all population sizes, but a population size of 3,000 retained 92-94% of genetic diversity initially present. Somewhat simplistic models of augmentation suggested extinction probabilities could be lowered substantially, and genetic diversity retention could be increased greatly, by supplementing small populations, if and when population sizes decline precipitously.

We evaluated alternative models for how sage-grouse population size increases as the amount of available habitat increases. The model in which sage-grouse populations increased linearly with increasing habitat size (no density dependence) was the best fit to the data. We used this model to estimate how many birds each population could support given the amount of habitat within currently occupied areas and other areas that could possibly be used with habitat improvement. Although habitat improvement could increase populations above modeled estimates, this analysis suggested that population targets in several local conservation plans are probably not achievable, given the amount of current and potential habitat.

Conservation strategies were identified for all significant threats to Gunnison sage-grouse, with a conservation goal of retaining large enough populations within the Gunnison Basin and elsewhere to have less than a 1% modeled risk of extinction, and to retain over 90% of genetic diversity over this 50-year time frame. While the Gunnison Basin is clearly the cornerstone for the preservation of this species, smaller populations retain 25% of the overall genetic diversity (not found in the Basin), and collectively represent a sizable pool of

individuals to buffer catastrophic, unforeseen losses in the Gunnison Basin. Population targets were recommended for each population based on an assessment of current and potential habitat, potential habitat improvements, and conservation needs. Targets represent an expected long-range average, along with a range of variation expected around this long-term average: Gunnison – 3,000 (range 1,730-5,280), San Miguel Basin – 450 (260-792), Monticello, UT – 300 (173-528), Dove Creek – 200 (115-352), Crawford – 275 (159-484), Piñon Mesa – 200 (115-352), and Poncha Pass – 75 (43-132).

To achieve and maintain these population targets, we identified local conservation strategies and local habitat protection goals. The most significant threat to Gunnison sage-grouse is permanent habitat loss from urban development or conversion. To meet these goals we recommend protecting 90% of all habitats currently occupied, or that become occupied through future expansion, through some combination of voluntary agreements, land use planning, easements, fee-title acquisition or land trades. We also present habitat guidelines to serve as a benchmark against which to evaluate habitat conditions, and develop strategies to minimize habitat degradation from other causes.

The Rangewide Conservation Plan is the first up-to-date and rigorous assessment of rangewide population and habitat data for Gunnison sage-grouse. However, it was evident in developing this plan that there are many gaps in our knowledge about Gunnison sage-grouse and sagebrush habitat, particularly in the context of a constantly changing landscape. Therefore, the Steering Committee recognizes the need to continually reevaluate and revise local and rangewide conservation plans in the light of new information, tools, and techniques, as part of an adaptive management process. An adaptive management program is an iterative process that uses information from research and monitoring projects to evaluate the relative effectiveness of alternative management plans, identify where important information is lacking, and to develop more effective management plans in order to accomplish the population and habitat goals of the Rangewide Plan. The Steering Committee will develop and implement an objective and quantitative adaptive management program in cooperation with the signatories of the Rangewide Plan and the local work groups.