

# TECHNICAL NOTES

U. S. DEPARTMENT OF AGRICULTURE

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Sage Grouse

The attached technical note, issued by Utah, is transmitted to you for incorporation into the Nevada Technical Notes - Biology Series. Please record the Nevada number in your Biology Index. rs



John Capurro  
State Resource Conservationist

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE

UTAH

NATURAL RESOURCES CONSERVATION SERVICE

June 16, 1997

ECS BIOLOGY TECHNICAL NOTE UT190-7-2  
190-VI

SUBJECT: ECS - BIOLOGY - UPLAND GAME - SAGE GROUSE

Purpose. To provide supplemental information on sage grouse habitat management and to update previous technical notes on sage grouse.

Supersedes. All previous technical notes on sage grouse.

Effective Date. When received.

Background: Due to declining populations from habitat loss, habitat restoration(s) have been submitted as priorities for the EQIP (Environmental Quality Improvement Program), WHIP (Wildlife Habitat Incentives Program) and CRP (Conservation Reserve Program). These new programs will be in effect until 2002 and provide an opportunity to enhance or restore habitat for sage grouse. The long term goal of habitat restoration and/or enhancement is to prevent the sage grouse population from declining to the point where it will be listed under the Threatened or Endangered Species Act. Due to the long term decline in the population of this species, it is already listed as a state sensitive species.

The "Brief Guidelines for Maintaining and Enhancing Sage Grouse Habitat on Private Land in Utah" (Jeffrey L. Beck and Dean L. Mitchell, UDWR 5/19/97) is provided by the Division of Wildlife Resources (DWR). It supplements the technical note (originally issued March 1970), on habitat management for sage grouse. The March 1970 technical note has been reprinted (without changes) and is included in this mailing. These are meant to complement the **Guidelines for Maintenance of Sage Grouse Habitats** (Braun, C.E., T. Britt and R.O. Wallestad, 1977). Two previous technical notes (12/74 and 5/1/79) referring to **Guidelines for Maintenance of Sage Grouse Habitats** have been updated and combined into one technical note and included in this mailing.

The supplemental guidelines from DWR are to aid in conservation planning that affects sage grouse habitat within Utah. The location map and vegetation information should be used as guides and specific recommendations on sage grouse habitat for your area

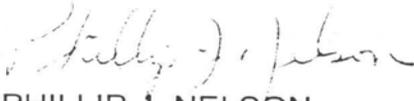
should be coordinated with the local DWR office as per the April 1, 1979, agreement to work together on plans involving sage grouse habitat.

DWR has made distribution of the supplemental guidelines within their agency. These guidelines are to be used when coordinating with partners and landowners on any proposed projects that could involve sage grouse habitat.

**Discard:** All previous technical notes on sage grouse within the upland game section and the previous index.

**Filing Instructions:** File Technical Notes in the Biology section of the Technical Notes binder behind the divider "Upland Game" in the order shown on the June 1997 index. An updated index has also been provided. File the new index of Utah Technical Notes immediately preceding the divider for Agronomy.

**Contact:** Bob Sennett, Wildlife Biologist, at (801) 524-5054.



PHILLIP J. NELSON  
State Conservationist

Enclosure

cc: (w/encl)  
Biologists, NRCS, Western States  
Dean Mitchell, DWR, SLC, UT  
Jeff Beck, DWR, Price, UT

# BRIEF GUIDELINES FOR MAINTAINING AND ENHANCING SAGE GROUSE HABITAT ON PRIVATE LANDS IN UTAH

Jeffrey L. Beck (Lands Biologist) and Dean L. Mitchell (Upland Game Coordinator)  
Utah Division of Wildlife Resources  
19 May 1997

## INTRODUCTION

In Utah, sage grouse (*Centrocercus urophasianus*) inhabit sagebrush habitat of the Colorado Plateau and Great Basin geographic regions from 6,000 to 9,000 feet in elevation. The largest populations of sage grouse are found in Rich County, Park Valley area (Box Elder County), on Diamond and Blue Mountains (Uintah County) and on Parker Mountain (Wayne County). Other smaller populations are found scattered in the Central and Southern parts of the state.

Historically, segments of all of Utah's 29 counties were thought to provide adequate habitat for sage grouse. Early pioneer journals suggest that sage grouse were abundant in the early 1800s. Today, sage grouse are found in 21 of Utah's counties (Mitchell et al. 1996).

Large fragments of historical sage grouse habitat have been lost in Utah. Losses and degraded habitat are attributed to agricultural and urban developments that have eliminated sagebrush. Overgrazing by domestic livestock has also contributed to a decline in sage grouse numbers.

It is estimated that sage grouse in Utah occupy only 50% of the habitat they once did and are one-half as abundant as they were prior to 1850. Annual strutting ground counts indicate an average of only 10 cocks per ground; a decrease of 51% from the long-term average (Mitchell et al. 1996). Population decreases in Utah are attributed to a decline in quantity and quality of habitat. Because of rangewide population declines, there have been recent threats by two conservation organizations to petition the U.S. Fish and Wildlife Service to list sage grouse under the Federal Endangered Species Act.

Recent research conducted in Utah and Colorado suggest that two species of sage grouse inhabit Utah. All Utah birds north of the Colorado River are classified taxonomically as being of the eastern race of sage grouse in North America. Nearly all birds found south and east of the Colorado River are thought to belong to a new species described as the Gunnison sage grouse. The Gunnison birds differ from all other sage grouse by being significantly smaller in size, exhibiting different breeding behaviors, and possessing specialized feathers (Hupp and Braun 1991, Young et al. 1994, Braun and Young 1995). In addition, the genetic makeup of Gunnison sage grouse is apparently markedly different than the eastern race of sage grouse.

Hunting is not believed to be a limiting factor on large sage grouse populations found in good habitat. The estimated annual harvest of sage grouse in Utah is less than 25% of the population.

Approximate annual mortality of sage grouse is 60%. Therefore, Utah's annual sage grouse harvest is within the harvestable surplus.

The only way to avoid Federal listing of sage grouse is to protect and enhance their habitats. The remainder of this document discusses critical habitats and ways to safeguard and maintain them.

## **HABITAT REQUIREMENTS**

Sage grouse occur only in the sagebrush-steppe of western North America. Sagebrush and sagebrush habitat are essential for survival of sage grouse populations. Sage grouse have specialized digestive systems. They lack a muscular gizzard, which limits their diets to soft foods (Patterson 1952).

Important areas of sagebrush rangeland that need to be protected and can be enhanced to provide optimal habitat for sage grouse include: strutting grounds (leks), water sources (springs, seeps, creeks, and livestock water developments), wet meadows, forb-dominated meadows, and south and west-facing ridges and slopes where grouse are known to winter.

### **Food**

Food habits of adult sage grouse change on a seasonal basis; however, sagebrush (*Artemisia* spp.) leaves are eaten throughout the year. Dependence on sagebrush, primarily big sagebrush (*A. tridentata*), reaches a peak from October through April when sagebrush leaves constitute the entire diet. In May, sage grouse diets change from being dominated by sagebrush to being dominated by forbs; in September diets switch back from forbs to sagebrush (Braun et al. 1977).

Juvenile sage grouse are dependent on insects and succulent forbs as critical food sources after hatching and up until brood dispersal in the fall. Broods will often relocate to forb-rich areas during the summer (Wallestad 1971). Peterson (1970) reported insects composed 60% of 1-week-old sage grouse chick diets and declined to 5% of the diet of 12-week-old chicks in central Montana. Insects commonly eaten by sage grouse chicks include grasshoppers, beetles, and ants (Johnson and Boyce 1990).

### **Cover**

Sagebrush-dominated rangelands provide habitat for all life requirements (i.e., cover, reproduction [strutting grounds], nesting, brood-rearing, and winter habitat) of sage grouse (Braun et al. 1977). Chemical and mechanical sagebrush treatments usually increase grass density and biomass. Grasses out compete shrubs and perennial forbs used by sage grouse for food and cover. Thus, sagebrush reduction efforts often reduce or even eliminate sage grouse populations.

Strutting grounds or leks are considered to be the center of sage grouse activities. It is imperative that sage grouse leks be protected. Sage grouse prefer open areas surrounded by sagebrush to strut on. The majority of nesting and brood-rearing activities occur within 2 miles (3 km) of a lek (Braun et al. 1977). Sage grouse have been known to establish new leks on recently disturbed sites (e.g., burns, gravel pits, and domestic sheep salting areas) (Connelly et al. 1981, Hulet 1983). However, sage grouse do not readily accept new strutting areas once existing grounds are destroyed .

Braun et al. (1977) summarized results from several sage grouse nesting studies and concluded that hens most frequently selected nesting sites in sagebrush stands containing 20-40 % canopy coverage. According to Braun et al. (1977), sage grouse hens in several studies normally selected the tallest shrubs at a site to nest under. The height of sagebrush commonly used varied from 7 (17 cm) to 31 (79 cm) inches. Sage grouse broods often feed in areas with lower sagebrush canopy cover and rest in areas with a higher canopy cover of sagebrush. Autenrieth (1976) reported that average sagebrush canopy at brood feeding sites was 10.4% and 30% at loafing sites.

Sage grouse prefer stands of sagebrush of at least 20% canopy cover for winter habitat (Hulet et al. 1984). Differences in topography, vegetative cover, and weather may force sage grouse to inhabit less than 10% of sagebrush-dominated ranges in winter. Some sage grouse populations are sedentary where suitable habitat remains year-round. Other populations must migrate to areas where suitable sagebrush habitat exists above winter snow levels (Hupp and Braun 1989). For example, sage grouse that spend summers in north-central Utah's Strawberry Valley migrate 15-20 miles (24.1-32.2 km) to winter in suitable habitat (Welch et al. 1990).

## RECOMMENDATIONS (Partially adapted from Braun et al. 1977:104)

1. Areas with less than 20% live sagebrush cover or on steep (20% or more gradient) upper slopes with skeletal soils where big sagebrush is 12 inches (30 cm) or less in height will not be subjected to treatments designed to remove sagebrush.
2. A 2 mile (3 km) radius area around all leks will be designated a grouse breeding complex. No sagebrush will be treated within this buffer zone.
3. Sagebrush control will not be attempted in areas known to have supported wintering concentrations of sage grouse within the past 10 years.
4. No sagebrush control will be attempted along streams, meadows, or secondary drainages (dry and intermittent). A 328-ft (100 m) strip (minimum) of living sagebrush will be retained on each edge of meadows and drainages.
5. When sagebrush control is absolutely unavoidable in sage grouse range, all treatment measures should be applied in irregular patterns using topography and other ecological considerations. Widths of treated and untreated areas can vary for the convenience of application technique; except, treated areas will not be wider than 100 ft (30 m) and untreated areas will be at least as wide as treated areas.
6. Range seedings will focus on establishment of forbs (Table 1) and subspecies of big sagebrush (*A. tridentata* spp.) (Table 2). Grasses (Table 3) that do not out compete beneficial forbs and shrubs should also be considered in seeding mixtures. Soil type, elevation, and amount of precipitation (Table 2) should be considered when determining suitability of plant materials to various locations.
7. When practical, big sagebrush root stock rather than seed should be planted to increase survivability.
8. Seedings designed strictly to increase grass production are discouraged. Seedings that contain a mixture of perennial grasses and forbs and big sagebrush are preferred.
9. Insecticides should not be applied in brood-rearing areas until after the critical period (1 September) of chick insect-consumption.
10. Fences should be erected around water sources and wet meadows existing in brood-rearing areas to restrict livestock, thereby protecting vulnerable forbs and grasses.
11. Livestock grazing should be managed to allow optimum growth of forbs and grasses. Unrestricted or overgrazing eliminates critical herbaceous plants from sagebrush rangelands and is detrimental to sage grouse populations.

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## APPENDIX

Table 1. Forbs<sup>a</sup> to be considered in seedings designed to enhance sage grouse habitat. Some forbs hold potential for food as well as providing habitat for insects eaten by grouse.

Common Name	Scientific Name <sup>b</sup>	Sagebrush	Notes
		Subspecies <sup>c</sup>	
Alfalfa	<i>Medicago sativa</i>	t, v	Preferred
Balsamroot	<i>Balsamorhiza</i> spp.	v	Potential
Cicer milkvetch	<i>Astragalus cicer</i>	v	Preferred
Clovers	<i>Trifolium</i> spp.	meadows	Potential
Lupines	<i>Lupinus</i> spp.	v	Preferred
Penstemons			
Eaton's	<i>Penstemon eatonii</i>	t, v	Potential
Palmer	<i>Penstemon palmeri</i>	t, w	Potential
Rocky mountain	<i>Penstemon strictus</i>	v	Potential
Wasatch	<i>Penstemon cyananthus</i>	v	Potential
Prickly lettuce	<i>Lactuca serriola</i>	w, t	Preferred
Sainfoin	<i>Onobrychis viciifolia</i>	v	Potential
Small burnet	<i>Sanguisorba minor</i>	t, v	Potential
Western yarrow	<i>Achillea millefolium</i>	t, v, w	Preferred
Yellow sweet-clover	<i>Melilotus officinalis</i>	t, v, w	Preferred

<sup>a</sup> Forb information provided by Richard Stevens, Great Basin Experiment Station, Ephraim, Ut.

<sup>b</sup> From Welsh et al. (1993).

<sup>c</sup> Sagebrush types are: t = tridentata (basin big sagebrush); v = vaseyana (mountain big sagebrush); and w = wyomingensis (Wyoming big sagebrush)

Table 2. Big sagebrush (*A. tridentata*) subspecies suitable for planting in sage grouse habitat.

Common Name	Scientific Name <sup>a</sup>	Suitability <sup>c</sup>	
		Elevation (ft)	Precipitation (in)
Basin big	<i>tridentata</i>	3,000 to 7,000	11 to 15
Mountain or Vasey's	<i>vaseyana</i>	5,000 to 10,000	14 to 30
Wyoming <sup>b</sup>	<i>wyomingensis</i>	3,000 to 6,000	8 to 10

<sup>a</sup> From Welsh et al. (1993).

<sup>b</sup> Wyoming big sagebrush is more palatable to sage grouse and big game than basin big sagebrush.

<sup>c</sup> Sagebrush information provided by Richard Stevens, Great Basin Experiment Station, Ephraim, Ut.

Table 3. Grasses<sup>a</sup> to be considered in seedings designed to enhance sage grouse habitat.

Common Name	Scientific Name <sup>b</sup>	Sagebrush Subspecies <sup>c</sup>	Notes
<b>Introduced Grasses</b>			
Orchardgrass, Paiute	<i>Dactylis glomerata</i>	v	Bunch grass
Perennial mountain rye	<i>Secale montanum</i>	t, v	Bunch grass
Russian wildrye	<i>Elymus junceus</i>	w	Bunch grass
Timothy	<i>Phleum pratense</i>	v	Bunch grass
<b>Native Grasses</b>			
Bluebunch wheatgrass	<i>Elymus spicatus</i>	t, v	Bunch grass
Great Basin wildrye	<i>Elymus cinereus</i>	t, v	Bunch grass
Green needlegrass	<i>Stipa viridula</i>	v	Bunch grass
Idaho fescue	<i>Festuca idahoensis</i>	t, v	Bunch grass
Indian ricegrass	<i>Stipa hymenoides</i>	w	Bunch grass
Sandberg's bluegrass	<i>Poa secunda</i>	t, v	Bunch grass
Sheep fescue	<i>Festuca ovina</i>	t, v	Bunch grass
Sherman big bluegrass	<i>Poa ampla</i>	v	Bunch grass
Streambank wheatgrass	<i>Elymus riparium</i>	v	Sod-forming
Thickspike wheatgrass	<i>Elymus lanceolatus</i>	t, v, w	Sod-forming
Western wheatgrass	<i>Elymus smithii</i>	t, v, w	Sod-forming

<sup>a</sup> Grass information provided by Richard Stevens, Great Basin Experiment Station, Ephraim, Ut.

<sup>b</sup> From Welsh et al. (1993).

<sup>c</sup> Sagebrush types are: t = tridentata (basin big sagebrush); v = vaseyana (mountain big sagebrush); and w = wyomingensis (Wyoming big sagebrush).