

# *Sagebrush Habitat Management For Sage-grouse*



CPW Habitat Coordinators:  
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# Objectives:

## 1) Managing for Sage-grouse habitat structure

Table 1. GUSG breeding habitat guidelines<sup>a</sup>.

Vegetation Variable	BREEDING HABITAT <sup>b</sup>			
	Gunnison sage-grouse		Connelly et al. (2000)	
	Arid <sup>c</sup>	Mesic <sup>c</sup>	Arid	Mesic
Sagebrush Canopy <sup>d</sup> %	15 - 25	10 - 20	15 - 25	15 - 25
Non-sagebrush Canopy <sup>d</sup> %	5 - 15	5 - 15	-	-
Total Shrub Canopy <sup>d</sup> %	20 - 40	15 - 35	-	-
Sagebrush Height <sup>e</sup> cm (inches)	25 - 50 (9.8 - 19.7)	30 - 50 (11.8 - 19.7)	30 - 80 (11.8 - 31.5)	40 - 80 (15.7 - 31.5)
Grass Cover <sup>d</sup> %	10 - 30	20 - 40	-	-
Forb Cover <sup>e</sup> %	5 - 15	20 - 40	≥ 15	≥ 25
Grass Height <sup>f</sup> cm (inches)	10 - 15 (3.9 - 5.9)	10 - 15 (3.9 - 5.9)	> 18 (> 7.1)	> 18 (> 7.1)
Forb Height <sup>f</sup> cm (inches)	5 - 10 (2.0 - 3.9)	5 - 15 (2.0 - 5.9)	-	-

Table 3. GUSG winter habitat guidelines<sup>a</sup>.

Vegetation Variable	WINTER HABITAT <sup>b</sup>			
	Gunnison sage-grouse		Connelly et al. (2000)	
	Arid <sup>c</sup>	Mesic <sup>c</sup>	Arid	Mesic
Sagebrush Canopy <sup>d</sup> %	30 - 40	-	10 - 30	10 - 30
Sagebrush Height <sup>e</sup> cm (inches)	40 - 55 (15.8 - 21.7)	-	25 - 35 (9.8 - 13.8)	25 - 35 (9.8 - 13.8)

<sup>a</sup> Winter habitat guidelines were developed using GUSG data from Hupp (1987).

<sup>b</sup> Winter habitat is defined as sagebrush areas (Connelly et al. 2000) within currently occupied habitat that are available (i.e., not covered by snow) to sage-grouse in average winters.

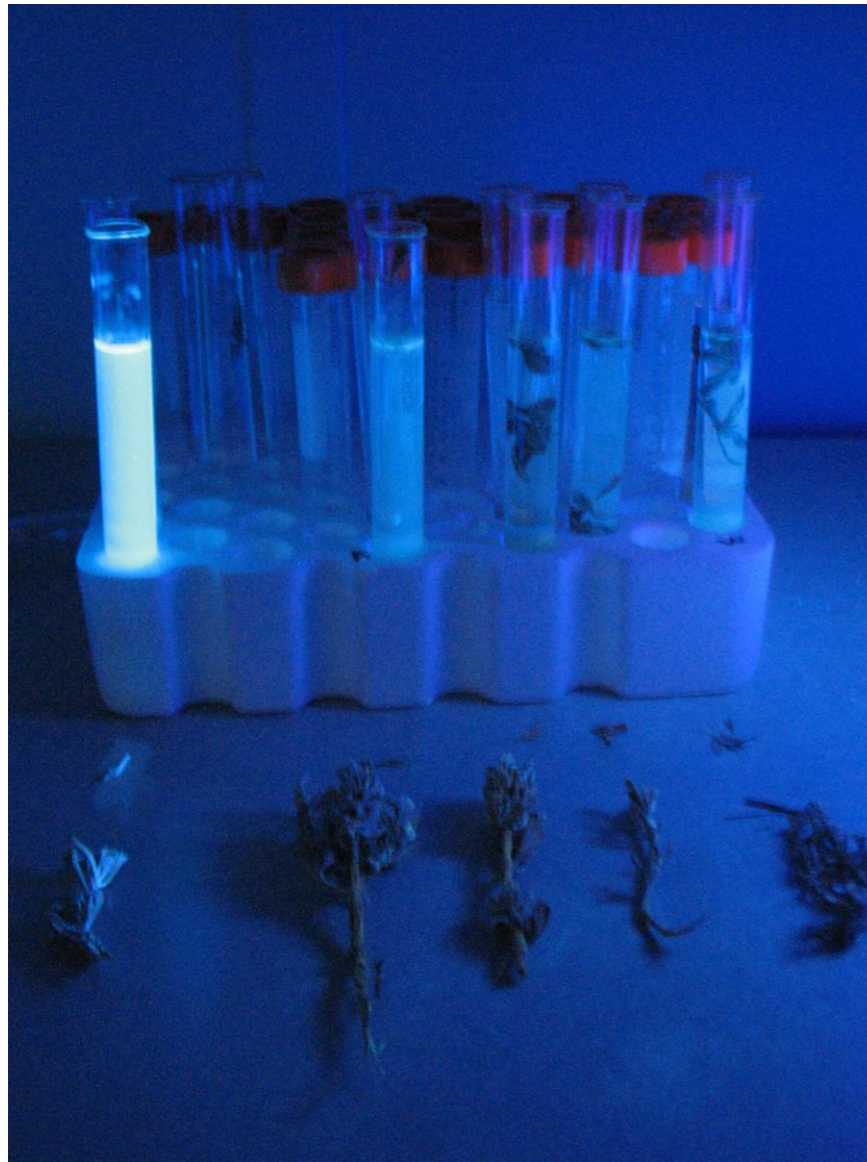
## 2) CPW capacity to partner on projects



Not A Treatment Seminar



# Identification and Management of Sagebrush Communities



**Table 1**—Twenty-three sagebrush taxa (species and subspecies) are listed in the order they are treated. Nomenclature follows McArthur (1983), with additional, newly described subspecies following Goodrich and others (1985), Rosentreter and Kelsey (1991), and Winward and McArthur (1995). The author chose to exclude taxa that are either beyond the geographic scope of this paper or that can be accounted for at a higher rank.

Scientific name	Common name
<b>Dwarf sagebrush</b>	
<i>Artemisia rigida</i>	Stiff sagebrush
<i>A. spinescens</i>	Bud sagebrush
<i>A. papposa</i>	Fuzzy sagebrush
<i>A. tripartita</i> ssp. <i>rupicola</i>	Wyoming threetip sagebrush
<i>A. bigelovii</i>	Bigelow sagebrush
<i>A. pygmaea</i>	Pygmy sagebrush
<i>Tanacetum nuttallii</i>	Chicken sage
<i>Artemisia longiloba</i>	Early sagebrush
<i>A. arbuscula</i> ssp. <i>longicaulis</i>	Lahontan sagebrush
<i>A. nova</i>	Black sagebrush
<i>A. arbuscula</i>	Low sagebrush
<b>Tall sagebrush</b>	
<i>A. cana</i> ssp. <i>cana</i>	Plains silver sagebrush
<i>A. cana</i> ssp. <i>bolanderi</i>	Bolander's silver sagebrush
<i>A. cana</i> ssp. <i>viscidula</i>	Mountain silver sagebrush
<i>A. tripartita</i> ssp. <i>tripartita</i>	Threetip sagebrush
<i>A. tridentata</i> ssp. <i>spiciformis</i>	Subalpine big sagebrush
<i>A. tridentata</i> ssp. <i>vaseyana</i>	Mountain big sagebrush
<i>A. tridentata</i> ssp. <i>vaseyana</i> var. <i>pauciflora</i>	
<i>A. tridentata</i> ssp. <i>wyomingensis</i>	Wyoming big sagebrush
<i>A. tridentata</i> ssp. <i>tridentata</i>	Basin big sagebrush
<i>A. tridentata</i> ssp. <i>xericensis</i>	Xeric big sagebrush
<b>Subshrub sagebrush</b>	
<i>Artemisia frigida</i>	Fringed sagebrush
<i>A. pedatifida</i>	Bird foot sage

Rosentreter

USDA Forest Service Proceedings RMRS-P-000. 2004

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Sagebrush Identification, Ecology, and Palatability Relative to Sage-Grouse



Minimum of 21 Sagebrush Taxa in Colorado



# Simplified By Site Characteristics

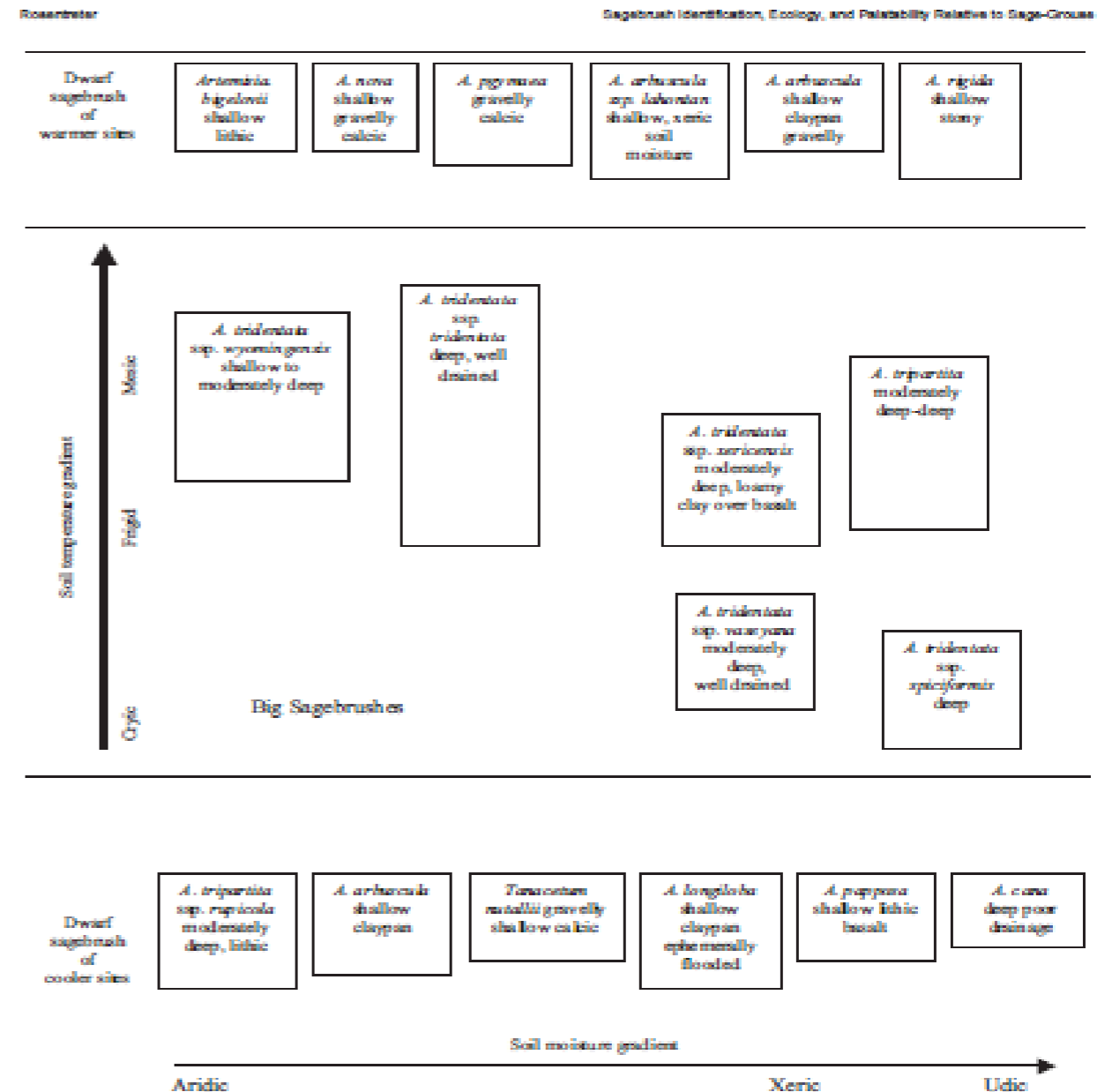
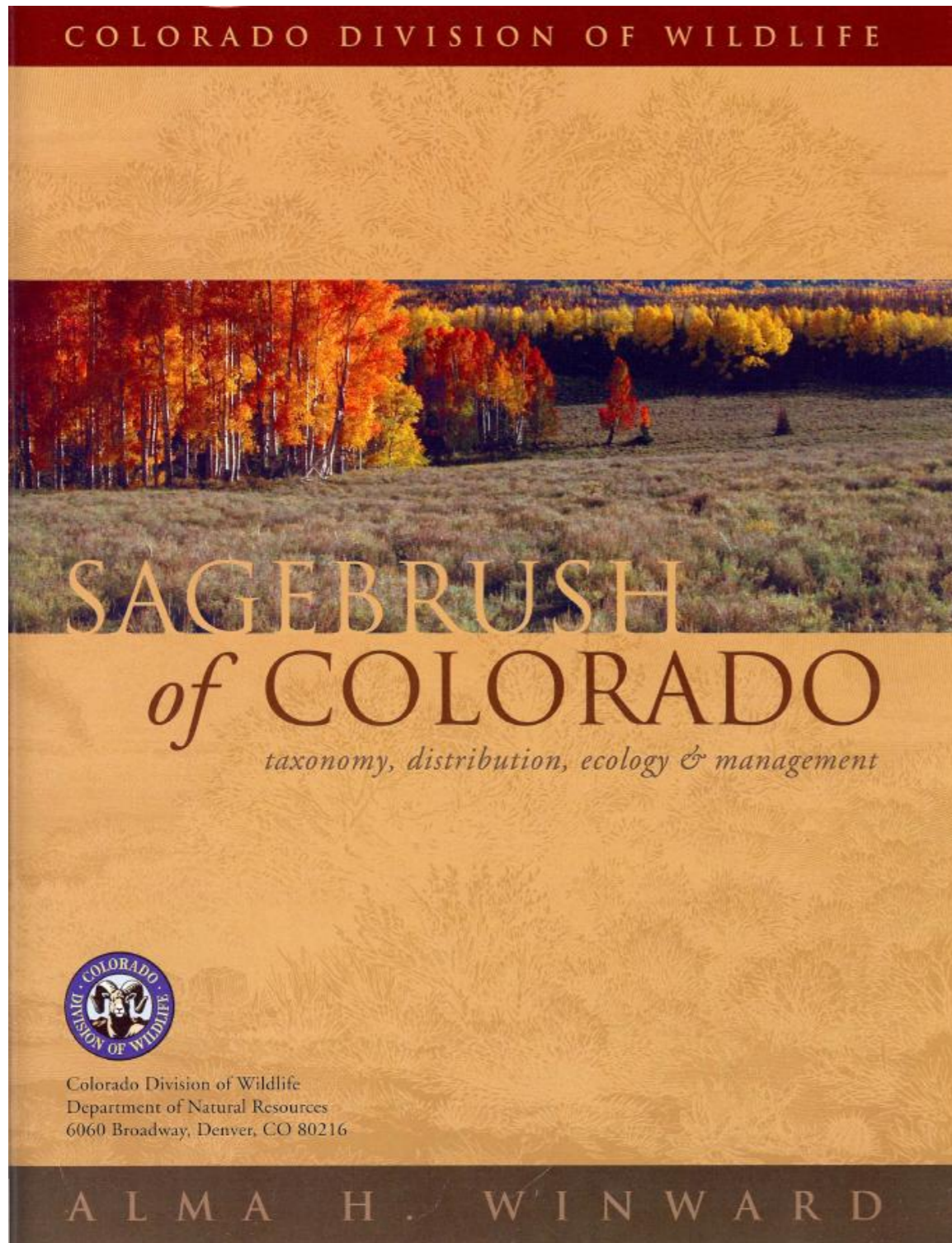


Figure 1—Environmental distribution of woody *Artemisia* taxa arranged by soil moisture, depth, texture, mineralogy, and soil temperature (modified from West 1988).



Sagebrush Ecosystem: Arid and semi-arid, sagebrush-dominated lands in the western United States and Canada that encompass the approximate boundaries of the historical range of greater and Gunnison sage-grouse (Wisdom et al. 2005).



# CSU Learning from the Land is building state-and - transition models for these sites....



Loamy 7-10"  
Moffat County (Western)



Sandy Land and Rolling Loam  
Moffat County (Eastern)



Mountain Loam  
Rio Blanco/ Garfield Counties



Lower, 7-12" annual precipitation

**Precipitation**

Higher, 14 -35" annual precipitation



Seasonal use by Sage-grouse varies greatly by year,  
annual precipitation patterns, and population



Elevation: 6,800' to 10,000'

Precipitation: Over 14"

Flowering/Seed Set: Seed Set Late September to October

Plants Usually Less Than 3' Tall

Site Characteristics: Higher Elevations Upper PJ to Mtn Shrub Zone And Up  
On A Wide Variety Of Soils



Mountain Big Sagebrush (*ssp. vaseyana*)



## Sage-grouse Habitat Value: (Varies by Population)

- Breeding To Exclusively Summer Habitat
- Winter If Not Snow Covered



Mountain Big Sagebrush (*ssp. vaseyana*)



Elevation: 2,600' to 7,200'

Precipitation: 8"- 12"

Flowering/Seed Set: Seed Set October to Early December

Plant Usually Less Than 3' Tall

Site Characteristics: Arid Sites With Coarse Textured Soils At Or Below PJ Zone



Wyoming Big Sagebrush (*ssp. wyomingensis*)



## Sage-grouse Habitat Value: (Typical Habitat of GrSG Rangeland)

- Breeding Habitat
- Summer Habitat If Associated Riparian
- Winter Habitat



Wyoming Big Sagebrush (*ssp. wyomingensis*)



Elevation: 2,300' to 11,500'

Precipitation: 7"-20"

Flowering/Seed Set: Late Spring to Early Summer / August to September

Plants Usually Less Than 20" Tall

Site Characteristics: Usually Clay Poorly Drained Soils and Wind-Swept Ridges



Low/Alkali/Early Sagebrush (*A. arbuscula*)



Elevation: 4,900' to 7,900'

Precipitation: 6"- 20"

Flowering/Seed Set: Late Summer / Seed Set September to October

Orange Seed Heads Remain On Plant Late Into Spring

Site Characteristics: Usually Rocky Shoulders and Shallow Coarse/Gravelly Soils



Black Sagebrush (*A. nova*)



## Sage-grouse Habitat Value:

- Limited Breeding Habitat
- Summer Habitat
- Preferred Winter Habitat Depending On Snow Depth

Eroding Alkali Sagebrush Shrubland



Low / Alkali / Early / Black Sagebrush



Elevation: 1,900' to 7,000'

Precipitation: 8" - 16"

Flowering/Seed Set: Seed Set October to December

Site Characteristics: Deep Well Drained Soils and Valley Bottoms



Basin Big Sagebrush (*ssp. tridentata*)



# Sage-grouse Habitat Value: (Includes Greasewood Complex)

- Summer Habitat
- Possibly Winter In Extreme Snow Years
- Historically May Have Been More Widely Utilized



Basin Big Sagebrush (*ssp. tridentata*)



# Sage-grouse Habitat Value: - Summer



*Riparian Habitat*



# *Habitat Management For Sage-grouse*



*Quantity Matters*



# Annual Precipitation Extremes

## Both Winter and Drought

Winter 2010 - 2011



Winter 2011 - 2012



Bush Form = Spreading



Bush Form = Columnar



*Structure and Diversity Matters*





# *Nesting Habitat*

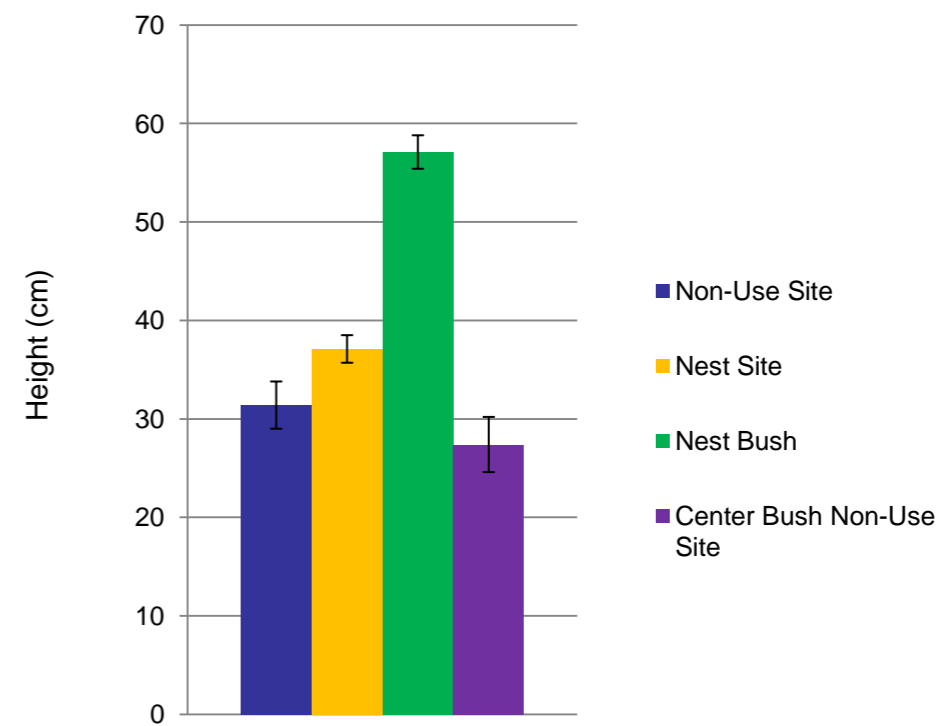
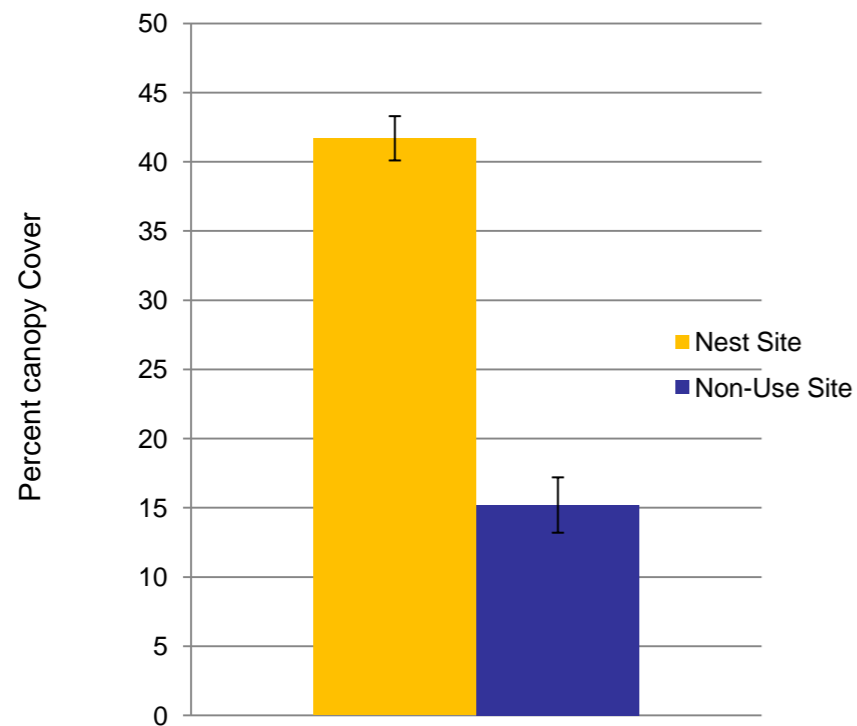


# Nest Vegetation Findings

North Park sage-grouse are nesting in THICK sagebrush stands (mean = 42% canopy cover)

Percent canopy cover at nest sites was 2.7 times higher at nest sites.

- North Park sage-grouse are nesting in areas with overall tall sagebrush and under TALL sagebrush plants (mean = 57 cm or 23 inch tall)



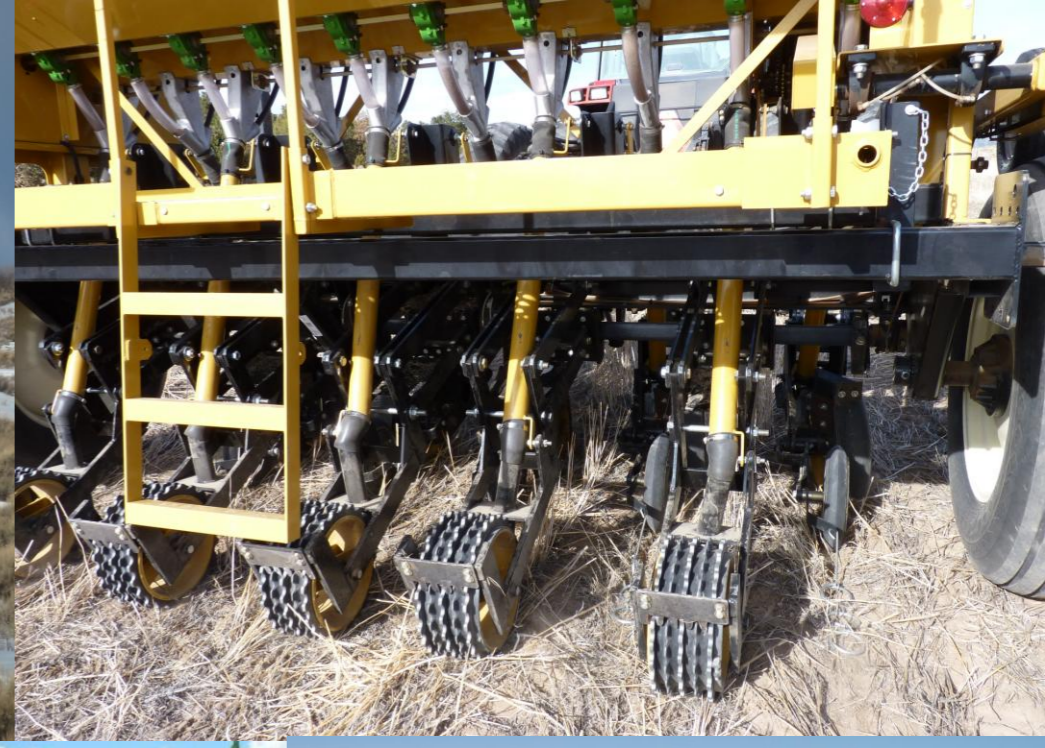


# *Habitat Management Tools*



Passive Management: Conservation Easements, Grazing Management, and Pro-active Property Maintenance





# Restoration/Reclamation





# *Mechanical Management: Common Treatment*





# *Chemical Management*





## *Prescribed Fire*



# *Restoration Techniques: What To Expect*





**FIRST, SIMPLY CHANGING THE ARRANGEMENT OF PLANTS ON THE LANDSCAPE DOES NOT CONSTITUTE HABITAT IMPROVEMENT. SAGEBRUSH IS NOT VERMIN.**

**SECOND, WE MUST THINK ABOUT THE FUNCTIONAL NEEDS OF SAGE GROUSE BEFORE ALTERING PLANT COMMUNITIES**

**THIRD, WE MUST HAVE RELIABLE KNOWLEDGE TO PREDICT HOW ANIMALS & PLANTS WILL RESPOND TO HABITAT MANIPULATIONS.**



**Setting Management Goals**



*BOTTOM LINE: ONCE DISTURBED  
A 15-30% CANOPY WILL LIKELY  
TAKE DECADES TO RE-ESTABLISH*



*WYOMING SAGEBRUSH*



# *FOR WYOMING SAGEGRUSH CONSIDER THE FOLLOWING:*

- Is the habitat occupied by sage-grouse now?
- When is it occupied and what role does it play?
- Seasonal habitats do not have to be in perfect ecological balance. For example, dirt and sagebrush make suitable winter habitat.
- Are perceived deficiencies being met in other adjacent areas?







# *Mountain Sagebrush Examples*



# *Recovery Time*

## Wyoming Big Sagebrush

Recovery from disturbance should not be expected in less than 25 years.

## Mountain Big Sagebrush

Recovery from disturbance should not be expected in less than 10 to 15 years.

Both Species Relatively Long Lived - Up to 200 Years

Succession Patterns: Sagebrush functions as either a subdominant shrub in PJ/Mtn Shrub sites or a dominant over story shrub as in areas like the Great Divide.

Each Succession Stage Takes 100's of Years





# Managing Toward The Future

- *Conservation Easements*

- *Expansion/Maintenance of Occupied Habitat*

- *Focusing On Disturbed Sites*





# *CPW SERVICES*

- *Seed Warehouse and Plant Materials*
- *Project Implementation Programs*
- *Local Staff Logistical Support*
- *Grouse Utilization Landscape Planning*





# Web Based Resources

Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

Ecological Site Descriptions: <http://esis.sc.egov.usda.gov/>

Sagemap: <http://www.sagemap.wr.usgs.gov/monograph.aspx>

SageSTEP: <http://sagestep.org>

Great Basin Research and Management Partnership:  
<http://greatbasin.wr.usgs.gov/GBRMP/index.html>

NRCS PLANTS: <http://plants.usda.gov>

