CHAPTER 3 FIGURES

Figure 3-1. BLM Casper Field Office, Medicine Bow National Forest and Thunder Basin National Grassland

[Diagram of wind speed and direction data for Casper Mountain, Wyoming, 2011-2013, with various wind speed intervals marked on a compass rose and data for specific dates and times.]
Figure 3-2. BLM Kemmerer Field Office and Bridger-Teton National Forest

Figure 3-3. BLM Newcastle Field Office & Thunder Basin National Grassland
Figure 3-4. BLM Pinedale Field Office & Bridger-Teton National Forest

Figure 3-5. BLM Rawlins Field Office & Medicine Bow National Forest
Figure 3-6. BLM Rock Springs Field Office & Bridger-Teton National Forest

Figure 3-7. Capacity to Disperse Pollutants Rock Springs, Wyoming
Figure 3-8. Criteria Pollutant Concentrations in the BLM Casper Field Office Area, Medicine Bow-Routt National Forest and Thunder Basin National Grassland

- NO2: Natrona County
- O3: Natrona County
- PM2.5: Natrona County
- PM10: Converse County
- SO2: Natrona County
Figure 3-9. Criteria Pollutant Concentrations in the BLM Kemmerer Field Office Area and Bridger-Teton National Forest

- NO2: Uinta County
- O3: Uinta County
- PM2.5:
- PM10: Lincoln County
- SO2: Uinta County
Figure 3-10. Criteria Pollutant Concentrations in the BLM Newcastle Field Office Area and Thunder Basin National Grassland

- NO2: Crook County
- O3: Crook County
- PM2.5: Weston County
- PM10: Weston County
- SO2: Weston County
Figure 3-11. Criteria Pollutant Concentrations in the BLM Pinedale Field Office Area and Bridger-Teton National Forest

- CO: Teton County
- NO2: Sublette County
- O3: Sublette County
- PM2.5: Sublette County
- PM10: Sublette County
Figure 3-12. Ozone Concentrations in the Pinedale Field Office Area and Bridger-Teton National Forest

Boulder: AQS site ID 56-035-0099
Daniel: AQS site ID 56-035-0100
Juel Springs: AQS site ID 56-035-1002
Figure 3-13. Criteria Pollutant Concentrations in the BLM Rawlins Field Office Area and Medicine Bow National Forest

NAAQS

CO: Laramie County
NO2: Carbon County
O3: Carbon County
PM2.5: Albany County
PM10: Albany County
SO2: Carbon County
Figure 3-14. Criteria Pollutant Concentrations in the BLM Rock Springs Field Office Area and Bridger-Teton National Forest

CO: Sweetwater County
NO2: Sweetwater County
O3: Sweetwater County
PM2.5: Sweetwater County
PM10: Sweetwater County
SO2: Sweetwater County
Figure 3-15. Daily Visibility near Sage-grouse Planning Area Bridger Wilderness

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Bridger station: BRID1
Visibility measured every 3 days from 1988 through present
Figure 3-16. Daily Visibility near Sage-grouse Planning Area Yellowstone National Park

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Yellowstone National Park station: YELL1, YELL2
Visibility measured every 3 days from 1988 through present
Figure 3-17. Daily Visibility near Sage-grouse Planning Area North Absaroka Wilderness

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE North Absaroka station: NOAB1
Visibility measured every 3 days from 2000 through present
Figure 3-18. Daily Visibility near Sage-grouse Planning Area Cloud Peak Wilderness

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Cloud Peak station: CLPE
Visibility measured every 3 days from 2002 through present
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Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Brooklyn Lake station: BRLA1
Visibility measured every 3 days from 1993 through 2003
Figure 3-20. Daily Visibility near Sage-grouse Planning Area Rocky Mountain National Park

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Rocky Mountain National Park station: ROMO1
Visibility measured every 3 days from 1990 through present
Figure 3-21. Daily Visibility near Sage-grouse Planning Area Thunder Basin

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Thunder Basin station: THBA1
Visibility measured every 3 days from 2002 through present
Figure 3-22. Daily Visibility near Sage-grouse Planning Area Boulder Lake

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Boulder Lake IMPROVE station: BOLA1
Visibility measured every 3 days from 2010 through present
Figure 3-23. Annual Visibility (Standard Visual Range) near Sage-grouse Planning Area
Bridger Wilderness

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Bridger station BRID1

20% cleanest
average
20% haziest
Figure 3-24. Annual Visibility (Standard Visual Range) near Sage-grouse Planning Area
Yellowstone National Park

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Yellowstone National Park station YELL1, YELL2
Figure 3-25. Annual Visibility (Standard Visual Range) near Sage-grouse Planning Area
North Absaroka

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE North Absaroka station: NOAB1
Figure 3-26. Annual Visibility (Standard Visual Range) near Sage-grouse Planning Area
Cloud Peak

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Cloud Peak station: CLPE1
Figure 3-27. Annual Visibility (Standard Visual Range) near Sage-grouse Planning Area
Rocky Mountain National Park

Data taken from Inter-Agency Monitoring of Protected Visual Environments
IMPROVE Rocky Mountain National Park station: ROMO1
Figure 3-28. Mean Annual Precipitation pH in the Sage-grouse Planning Area Pinedale, Wyoming

Data taken from National Atmospheric Deposition Program
NADP Pinedale station WY06
Normal range of precipitation pH:
5.0 - 5.6 (Seinfeld, 1986)
Figure 3-29. Mean Annual Precipitation pH in the Sage-grouse Planning Area

Data taken from National Atmospheric Deposition Program
NADP Pinedale station WY06
NADP Sinks Canyon station WY02
NADP South Pass station WY97
Figure 3-30. Mean Annual Concentrations of Nitrogen Compounds near Sage-grouse Planning Area Pinedale, Wyoming

Data taken from Clean Air Status & Trends Network CASTNet Pinedale station PND165
Typical concentrations for remote areas:
HNO₃: 0.05 - 0.8 ug/m³
NH₄: 0.2 ug/m³
NO₃: 0.5 ug/m³
Figure 3-31. Mean Annual Concentrations of Nitrogen Compounds near Sage-grouse Planning Area Centennial, Wyoming

Data taken from Clean Air Status & Trends Network
CASTNet Centennial station CNT169
Typical concentrations for remote areas:
HNO3: .05 - 0.8 ug/m3
NH4: .2 ug/m3
NO3: .5 ug/m3
Figure 3-32. Mean Annual Concentrations of Nitrogen Compounds near Sage-grouse Planning Area Yellowstone National Park

Data taken from Clean Air Status & Trends Network
CASTNet Yellowstone station Yel408
Typical concentrations for remote areas:
HNO₃: .05 - 0.8 μg/m³
NH₄: .2 μg/m³
NO₃: .5 μg/m³
Figure 3-33. Mean Annual Concentrations of Nitrogen Compounds in the Sage-grouse Planning Area Pinedale

Data taken from Wyoming Air Resources Monitoring network WARMS Pinedale station

Typical concentrations for remote areas:
- HNO₃: 0.05 - 0.8 ug/m³
- NH₄: 0.2 ug/m³
- NO₃: 0.5 ug/m³
- tNO₃: 0.1 - 0.8 ug/m³

FIG-30  Wyoming Greater Sage-Grouse Land Use Plan Amendment
Figure 3-34. Mean Annual Concentrations of Sulfur Compounds near Sage-grouse Planning Area Pinedale, Wyoming

Data taken from Clean Air Status and Trend Network
CASTNet  Pinedale station:  PND165
Typical concentrations for remote areas
SO2:  2.6 - 26 ug/m3
SO4:  2.5 ug/m3
Figure 3-35. Mean Annual Concentrations of Sulfur Compounds near Sage-grouse Planning Area Centennial, Wyoming

Data taken from Clean Air Status & Trend Network
CASTNet Centennial station: CNT169
Typical concentrations for remote areas
SO2: 2.6 - 26 ug/m³
SO4: 2.5 ug/m³
Figure 3-36. Mean Annual Concentrations of Sulfur Compounds near Sage-grouse Planning Area Yellowstone National Park

Data taken from Clean Air Status & Trend Network
CASTNet Yellowstone station: YEL408
Typical concentrations for remote areas
SO2: 2.6 - 26 ug/m3
SO4: 2.5 ug/m3
Figure 3-37. Mean Annual Concentrations of Sulphur Compounds in the Sage-grouse Planning Area Pinedale

Data taken from Wyoming Air Resources Monitoring System (WARMS) Pinedale station
Typical concentrations for remote areas
SO2: 2.6 - 26 µg/m³
SO4: 2.5 µg/m³
Figure 3-38. Total Nitrogen Deposition in Pinedale

Total N Deposition

PND165

Source: CASTNET NADP—NTRP/REM

Only complete years are shown

Wyoming Greater Sage-Grouse Land Use Plan Amendment

FIG-35
Figure 3-39. Total Nitrogen Deposition in Yellowstone National Park

**Total N Deposition**

YEL406

![Bar Chart: Total Nitrogen Deposition in Yellowstone National Park (1997-2010)]

- **Source**: CASTNET/NOAP—NITRPREM
- **Note**: Only complete years are shown.
Figure 3-40. Total Nitrogen Deposition in Centennial

Total N Deposition

Source: CASTNET/NOAP—NIT/NPPREM

Only complete years are shown.
Figure 3-41. Total Sulphur Deposition in Pinedale

**Total S Deposition**

**PND165**

![Graph](image)

Source: CASTNET/NAQP-NITV/PREM

Only complete years are shown.

**FIG-38**

*Wyoming Greater Sage-Grouse Land Use Plan Amendment*
Figure 3-42. Total Sulphur Deposition in Yellowstone National Park

Total S Deposition

YEL408

Source: CASTNET/ADAP—N7V/FREM

Only complete years are shown.
Figure 3-43. Total Sulphur Deposition in Centennial

Total S Deposition

CNT 169

Source: CASTNET/NAOIP-NiginPREM

Only complete years are shown.

FIG-40  Wyoming Greater Sage-Grouse Land Use Plan Amendment
Figure 3-44. Climate Change in Northern Latitudes

Northern Latitudes
(90°N-23.6°N)

Temperature Anomaly (°C)

1900 1920 1940 1960 1980 2000

Source: NASA, Goddard Institute for Space Studies (http://data.giss.nasa.gov/gistemp/graphs_v3/)
Figure 3-45. Average Temperature and Precipitation Trends

Rate of Long-Term Trend Temperature Change (top; °F per decade)
& Precipitation Change (bottom; inches per decade) – FULL YEAR

Based on 1941-2005 data
Trend begins 1976

Based on 1931-2005 data
Trend begins 1976

Rate of Change:
-1.20 to -0.80
-0.80 to -0.40
-0.40 to -0.20
-0.25 to -0.10
-0.10 to 0.10
0.10 to 0.20
0.25 to 0.40
0.40 to 0.60
0.60 to 0.80
0.80 to 1.00
1.00 to 1.20

FIG-42  Wyoming Greater Sage-Grouse Land Use Plan Amendment
Figure 3-46. Socioeconomic Study Area, Planning Area, and Surface Land Tenure
Figure 3-47. Distribution of Soil Stability Ratings Forestwide for the Bridger-Teton National Forest
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Figure 3-51. Average Number of Displaying Male Greater Sage-Grouse per Lek (1996-2011) in the Thunder Basin National Grassland

Figure 3-52. Minimum Estimated Greater Sage-Grouse Population (1998-2011) in the Thunder Basin National Grassland
Figure 3-53. Prairie Dog Acres in the Thunder Basin National Grassland

Figure 3-54. Number of Displaying Male Sharp-tailed Grouse Observed Annually (2003-2011) in the Thunder Basin National Grassland
Figure 3-55. Percent of Active Raptor Nests in the Thunder Basin National Grassland
Figure 3-56. Elk Population for the Thunder Basin National Grassland

Rochelle Hills Elk Population

- Estimated Population
- Population Objective
Figure 3-57. Pronghorn Antelope Herd Units for the Thunder Basin National Grassland

Figure 3-58. Highlight Herd Population for the Thunder Basin National Grassland
Figure 3-59. North Black Hills Population for the Thunder Basin National Grassland

![North Black Hills Antelope](image)

Figure 3-60. Gillette Herd Population for the Thunder Basin National Grassland

![Gillette Antelope](image)
Figure 3-61. Cheyenne River Herd Population for the Thunder Basin National Grassland

Cheyenne River Antelope

ANIMALS


0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000 55,000 60,000 65,000

Estimated Population
Population Objective

Figure 3-62. North Converse Population for the Thunder Basin National Grassland

North Converse Antelope

ANIMALS


0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000

Estimated Population
Population Objective
Figure 3-63. Mule Deer Herds for the Thunder Basin National Grassland

Mule Deer Habitat
on Thunder Basin National Grassland

Powder River

Black Hills

Cheyenne River

North Converse

Wright

Billings
Figure 3-64. Powder River Mule Deer Herd Population for the Thunder Basin National Grassland

Figure 3-65. Cheyenne River Mule Deer Herd Population for the Thunder Basin National Grassland
Figure 3-66. Black Hills Mule Deer Herd Population for the Thunder Basin National Grassland

![Black Hills Mule Deer Herd Population Graph](image)

Figure 3-67. North Converse Mule Deer Herd Population for the Thunder Basin National Grassland

![North Converse Mule Deer Herd Population Graph](image)
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