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Greater Sage-Grouse Plan Implementation

Rangewide and State Monitoring Report Summary

Background: The Sage-Grouse Monitoring Framework

- The 2015 land use plans include the Greater Sage-Grouse Monitoring Framework as an Appendix
- Identifies a suite of metrics for monitoring:
  - The national planning strategy
  - Land use plan implementation
- Requires a 5-year summary of monitoring results
- The Monitoring Framework is not affected by the 2019 Amendments

THE GREATER SAGE-GROUSE MONITORING FRAMEWORK

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Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam
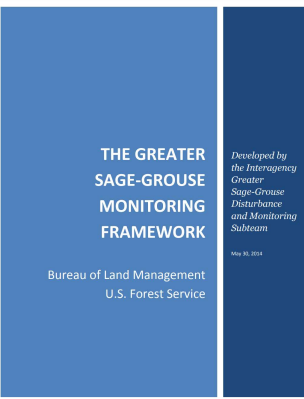
May 30, 2014

- The Sage-Grouse Monitoring Framework is an appendix in every 2015 sage-grouse land use plan amendment or revision
- It forms the basis for the BLM's monitoring report, outlining two levels of monitoring: The National Planning Strategy & Land Use Plan levels
- For each level of monitoring, a suite of metrics are identified and the BLM has aggregated information to address each in our monitoring report

Background: The Sage-Grouse Monitoring Framework

The national planning strategy (Rangewide) metrics:

1. Sagebrush availability and condition
2. Habitat degradation and intensity of activities
3. Population estimation and change
4. BLM and USFS contribution to changes in the amount of sagebrush
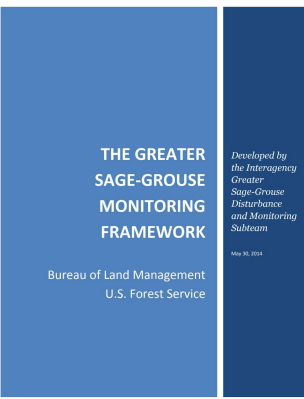5. BLM and USFS contribution to disturbance

- There are 5 metrics identified to evaluate the national planning strategy
- These constitute the "rangewide" portion of the BLM report

Background: The Sage-Grouse Monitoring Framework

The land use plan metrics (BLM State Office):

1. Habitat objectives
2. Achievement of land health standards
3. Disturbance objectives
4. Population trends

- There are four metrics identified for the land use plan monitoring
- These constitute each state office report, which are individual appendices to the rangewide report

The Monitoring Report – Structure

- The Rangewide portion of the Monitoring Report and 6 appendices address the national planning strategy metrics
- Each BLM State Office addresses the land use plan metrics in its own appendix (9 total)

- The BLM report is comprised of the main body plus 6 appendices (tables) addressing the rangewide topics
- Appendices to the rangewide report summarize information within each BLM State Office with a sage-grouse land use plan, plus a report for Washington state (Columbia basin population)

The Monitoring Report – Structure

The Rangewide and State Office report sections follow a similar format:

- Introduction
- Methods
- Results
- Discussion / Conclusions

However, the extents and information used to inform the metrics differ

Contents

- A similar format is used for both levels of reporting
- Different suites on information are used the rangewide and state office reports, however
- This information is summarized/analyzed at different scales as well

Rangewide Metrics – Scale of Analyses

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- 105 BSUs
- Metrics are aggregated to BSUs in two Regions
- Metrics are aggregated to BSUs Rangewide

Great Basin Region

Rocky Mountain Region
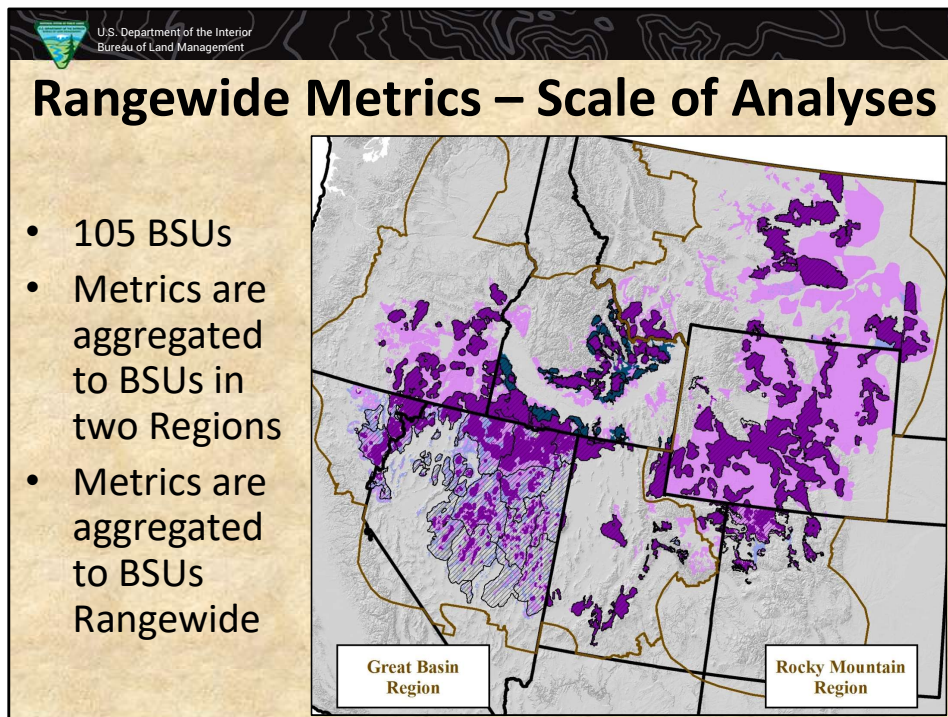
The BLM set the *minimum* extent for the majority of analyses used to evaluate the national planning strategy to *Biologically Significant Units (BSUs)*.

A BSU is a geographic unit of **Priority Habitat Management Areas** (Important HMA in ID)

BSUs are also the extent at which:
       Anthropogenic disturbance caps are evaluated (in addition to project scale)
       Habitat and population adaptive management triggers are evaluated

The **BSU scale** is used to address the following national planning strategy metrics:
1. Sagebrush availability (not condition)
2. Habitat degradation and intensity of activities
3. Population estimation and change –> Defer to SO Reports and USGS/State Wildlife Agency efforts
4. BLM and USFS contribution to changes in the amount of sagebrush
5. BLM and USFS contribution to disturbance

Rangewide Metrics – Scale of Analyses

The sagebrush condition metric:

- **Type 1 BLM lands** – Likely sage-grouse habitat
- **Type 2 BLM lands** – Other BLM rangelands
- Delineated in 2012 as part of the Landscape Monitoring Framework (LMF)

Sage-Grouse Habitat Type

- Type I Sage-Grouse Habitat
- Type II BLM Rangelands

Year	Type	BLM Sample	BLM Acres
2013	I	1,416	52,516,548
2013	II	577	100,355,684
2014	I	1,481	53,170,382
2014	II	686	110,743,171
2015	I	1,342	52,991,622
2015	II	621	108,396,312
2016	I	1,483	53,329,663
2016	II	787	108,772,929
2017	I	1,534	53,437,770
2017	II	531	105,122,253
2018	I	1,036	52,330,851
2018	II	510	103,048,838

- The condition portion of the rangewide report is informed by the BLM's Landscape Monitoring Framework data collection and analysis effort.
- In 2012, BLM rangelands were divided into "Type I" and "Type II" categories, where the best available information was used to identify likely sage-grouse habitats on BLM managed lands (Type I).
- Field sampling was intensified in the Type I areas to better inform vegetation structure and composition analyses in sage-grouse habitat.
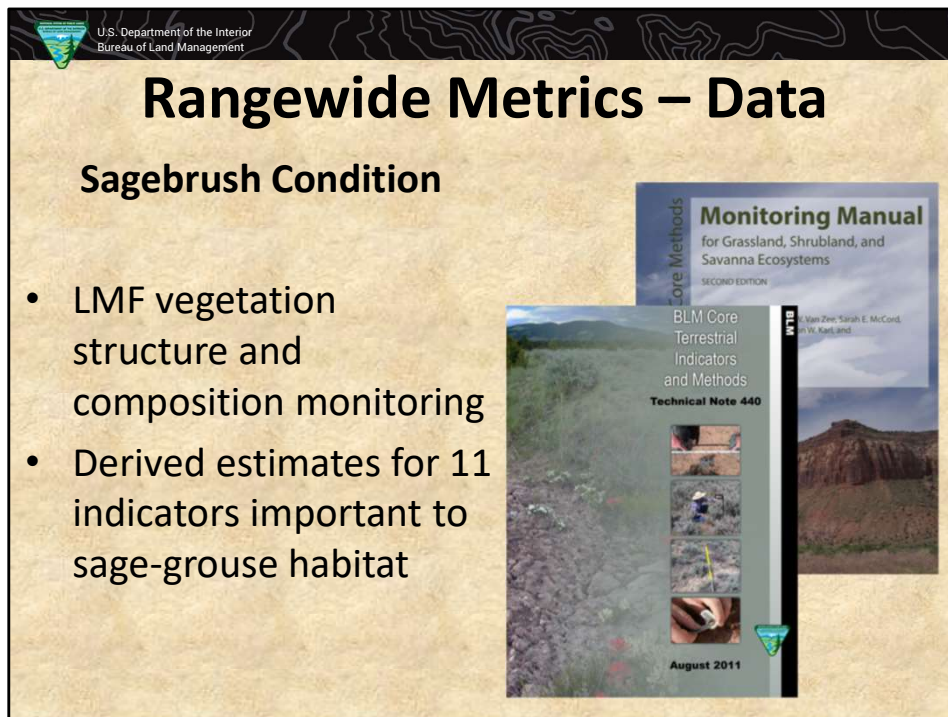
Rangewide Metrics – Data

Sagebrush availability & BLM and USFS contribution to changes in the amount of sagebrush

- LANDFIRE existing vegetation type (EVT): *current* sagebrush vegetation communities
- LANDFIRE biophysical settings (BpS): areas *historically capable* of supporting sagebrush vegetation communities
- Updated annually to remove areas lost to:
  - Fire (Fire perimeters, Monitoring Trends in Burn Severity)
  - Agricultural conversion (USDA - National Cropland Data)
  - Impervious surfaces (National Land Cover Database)
- 2012 – 2017, summarized by Surface Management Agency (BLM, USFS, Other Federal, State, Private)

- The monitoring framework outlines how LANDFIRE data is used to track sagebrush (EVT) loss
- We use LANDFIRE models of historical potential (BpS) to frame the sagebrush extent and loss estimates relative to areas believed to be capable of supporting sagebrush
- Each year areas of sagebrush lost to fire and agricultural conversion removed from this dataset, with impervious surface data being utilized approximately every 5 years based on its update frequency
- We present this sagebrush availability metric for years 2102 through 2017.
- This time lag is due to the availability of the Monitoring Trends in Burn Severity dataset, which is used to remove sagebrush lost to large (>1k acres) fires. The data is avaible 1.5 – 2 years after the fire season.
- This information is summarized by surface management agency (BLM data)

Rangewide Metrics – Data

Sagebrush Condition

- LMF vegetation structure and composition monitoring
- Derived estimates for 11 indicators important to sage-grouse habitat

The sagebrush condition metric is informed by on-the-ground- data, collected on BLM managed rangelands.

11 indicators are estimated:

1. Percent cover of sagebrush on BLM rangelands
2. Mean sagebrush species height in inches on BLM rangelands
3. Proportion of sagebrush that is columnar shaped on BLM rangelands
4. Proportion of sagebrush that is spreading shaped on BLM rangelands
5. Percent cover of perennial grasses and perennial forbs on BLM rangelands
6. Mean herbaceous plant species height in inches on BLM rangelands
7. Percent cover of bare ground on BLM rangelands
8. Proportion of BLM rangelands with nonnative invasive species present
9. Proportion of BLM rangelands where ≥25% of foliar cover is comprised of nonnative invasive species
10. Proportion of vegetation composed of annual grasses on BLM rangelands
11. Proportion of vegetation composed of nonnative invasive plant species on BLM rangelands

Rangewide Metrics – Data

Habitat degradation and intensity of activities & BLM and USFS contribution to disturbance

- Spatial data representing energy and infrastructure acquired annually
- Converted to polygons based on rulesets outlined in the Monitoring Framework
- Estimates of anthropogenic footprints and density of energy/mining activity
- 2015 - 2019

Table 6. Geospatial data sources for habitat degradation (Measure 2).

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

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- The BLM has been acquiring and combining spatial data representing anthropogenic development across the range
- These data are combined to estimate the footprints of energy and other infrastructure according to rulesets outlined in the Monitoring Framework
- Density of energy and mining activities are also estimated
- Each year, updated data are acquired and analyzed facilitating a trend analysis for 2015 - 2019

State Office Metrics – Scale of Analyses

1. Habitat objectives:
   - Habitat Management Areas (PHMA, GHMA, etc)
   - Seasonal Habitats (if available)
   - Habitat adaptive management trigger summary at BSU scale
2. Achievement of land health standards
   - Allotments with sage-grouse habitat
3. Disturbance objectives
   - Surface disturbing project summaries within PHMA & IHMA and disturbance cap compliance
4. Population trends
   - Population adaptive management trigger summary at BSU scale

- Each State Office repot addresses the land se plan metrics at slightly different scales as detailed here.
- These scales are identified in either the land use plan (habitat objectives, disturbance objectives, adaptive management triggers) or existing BLM scales of decision making (allotments for land health)

State Office Metrics – Data

1. Habitat objectives:
   - AIM and LMF monitoring locations → Count of plots meeting/not meeting by HMA & seasonal habitat
   - LMF based estimates at the state level
   - Habitat adaptive management triggers tripped summary
2. Achievement of land health standards
   - Acres meeting all land health standards
   - Acres not meeting all land health standards, grazing was causal, and management was changed
   - Some states provide additional information
3. Disturbance objectives
   - BLM/State tracking of authorizations in PHMA / IHMA
4. Population trends
   - In conjunction with State partners
   - Population adaptive management triggers tripped summary

The data analyzed to inform each metric also vary by metric as described here.
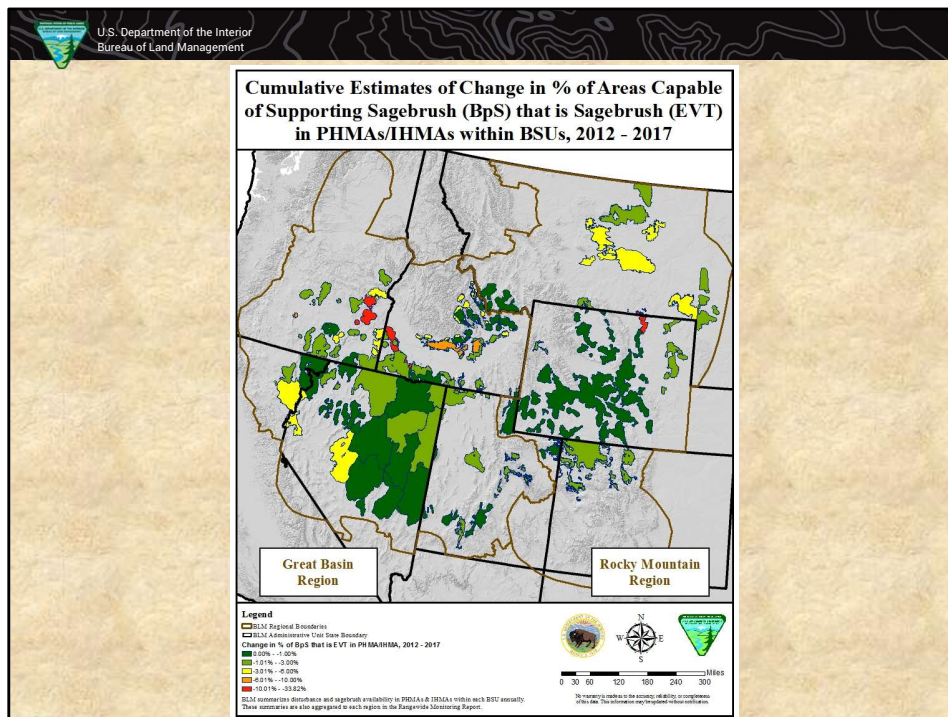
Findings

Rangewide Metrics: Sagebrush Availability

- Approximately 1.2M acres of sagebrush was last in PHMA/IHMA between 2012 – 2017
- Loss was greatest in the Great Basin (744k acres) vs Rocky Mountain (471k acres)
- Wildland fire is the largest cause of sagebrush loss at the rangewide scale
  - 75% of sagebrush loss in the Great Basin Region
  - 27% of sagebrush loss in the Rock Mountain Region
- Percent of areas *historically* capable of supporting sagebrush communities that are *currently* supporting sagebrush vegetation communities:
  - Great Basin 2012 ~79% → 2017 ~71%
  - Rocky Mountain 2012 ~86% → 2017 ~ 84%

- A great deal of sagebrush has been lost in PHMA/IHMA (as well as in other habitat management areas)
- The majority has been lost in the Great Basin BSUs
- The primary driver of all sagebrush loss has been wildland fire
- At the onset of monitoring, the great basin had a lower percentage of areas capable of supporting sagebrush in sagebrush than the rocky mountain region
- This remained true at the last year of data analysis

Cumulative Estimates of Change in % of Areas Capable of Supporting Sagebrush (BpS) that is Sagebrush (EVT) in PHMAs/IHMAs within BSUs, 2012 - 2017

- Sagebrush loss is not equally distributed across the landscape.
- This map identifies BSUs based on percent of change in sagebrush availability.
- Note that despite the rocky mountain region retaining more areas capable of supporting sagebrush in sagebrush, some BSUs have experienced a great deal of loss

Findings

Rangewide Metrics: Sagebrush Condition

- The beneficial attributes (sagebrush cover, height and shape, perennial grass and forb cover and height) remained relatively constant or displayed modest increases within sage-grouse habitats

- Of the nonbeneficial indicators of sagebrush community structure and composition monitored (bare ground, nonnative/invasive species, and annual grasses), nonnatives and annual grasses displayed an increase in presence and abundance within sage-grouse habitats.

- Invasives remain a threat and the monitoring data indicate that threat may be increasing

Findings

Rangewide Metrics: Habitat Degradation & Intensity of Development

- Estimates of anthropogenic footprints increased in PHMA/IHMA by approximately 0.3% from 2015 - 2019
- The Rocky Mountain Region accounted for ~68% of this increase.
- Density estimate changes were negligible (< 0.01 facilities/640 acres)
- No BSUs are estimated to exceed the 3% disturbance cap

- Modest increase of anthropogenic footprint in PHMA/IHMA
- Majority of this has occurred in the rocky mountain region
- Energy and mining density has remained fairly consistent
- No BSUs are estimated to be over the 3% cap

Cumulative Estimates of Change in % of PHMAs/IHMAs Disturbed within BSUs, 2015 - 2019
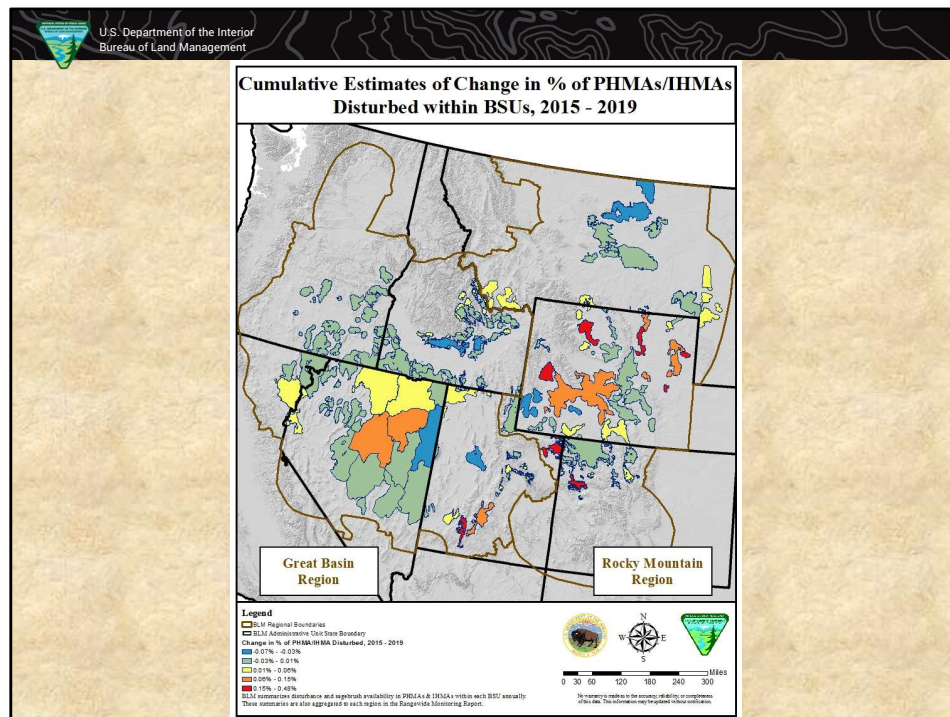
- Similar to sagebrush loss, changes in anthropogenic disturbance estimates are not uniform
- While the rocky mountain BSUs are the primary areas where anthropogenic disturbance has increased, some great basin BSUs have high increases as well

Findings

Rangewide Metrics: Contribution to sagebrush loss and disturbance

- Sagebrush loss in PHMA/IHMA was primarily on BLM managed lands (52%) and private lands (40%)

- Wildland fire and agricultural conversion do not reflect BLM/FS authorizations, but are primary drivers of loss

- Approximately 13% of sagebrush loss to impervious surfaces occurred on BLM managed lands

- Increases in estimated disturbance are primarily on BLM and privately managed lands (~50% and ~40% of the increase, respectively)

Findings

State Office Metrics

1. **Habitat objectives**:
   - Too variable to summarize succinctly here
   - 16 habitat adaptive management triggers have been tripped

2. **Achievement of land health standards:**
   - ~3 million acres of allotments with sage-grouse habitat have achieved, or are making progress towards achieving, all land health standards
   - Livestock grazing management was changed on more than 620,000 acres of allotments with sage-grouse habitat

- The state offices have summarized thousands of monitoring locations in sage-grouse habitats based on the habitat objectives tables' suite of indicators and benchmarks.
- Additionally, states provide descriptions of habitat adaptive management triggers that have been tripped
- A total of 16 triggers have been found to have tripped since 2015

- BLM has assessed and found that approximately 3 million acres within allotments that contain sage-grouse habitat are achieving or making progress towards achieving all land health standards
- Grazing management was changed on 620,000 acres in allotments with sage-grouse habitat where at least one land health standard was not achieved, and grazing was a causal factor for not meeting a standard.

Findings

State Office Metrics

3. **Disturbance objectives:**

   – A total of 604 *authorizations* representing approximately 73,000 acres in PHMA/IHMA

   – Authorization ≠ constructed

   – Exceptions to site-scale disturbance caps (two authorizations) are discussed.

4. **Population trends:**

   – In conjunction with State partners

   – 42 population adaptive management triggers have been tripped

- The state office reports detail 604 surface disturbing authorizations representing approximately 73,000 acres in PHMA and IHMA.
- These are not necessarily constructed to date & were in compliance with LUP management decisions regarding surface disturbing authorizations in PHMA/IHMA
- 2 projects exceeded site-scale caps, however the project level NEPA found a net benefit to this exceedance (avoiding undisturbed habitat etc)

- Population information is acquired from and analyzed with State partners
- A total of 42 population triggers have been tripped since 2015

Biologically Significant Units (BSUs) Where Adaptive Management Triggers Have Been Tripped* 2015 - 2019
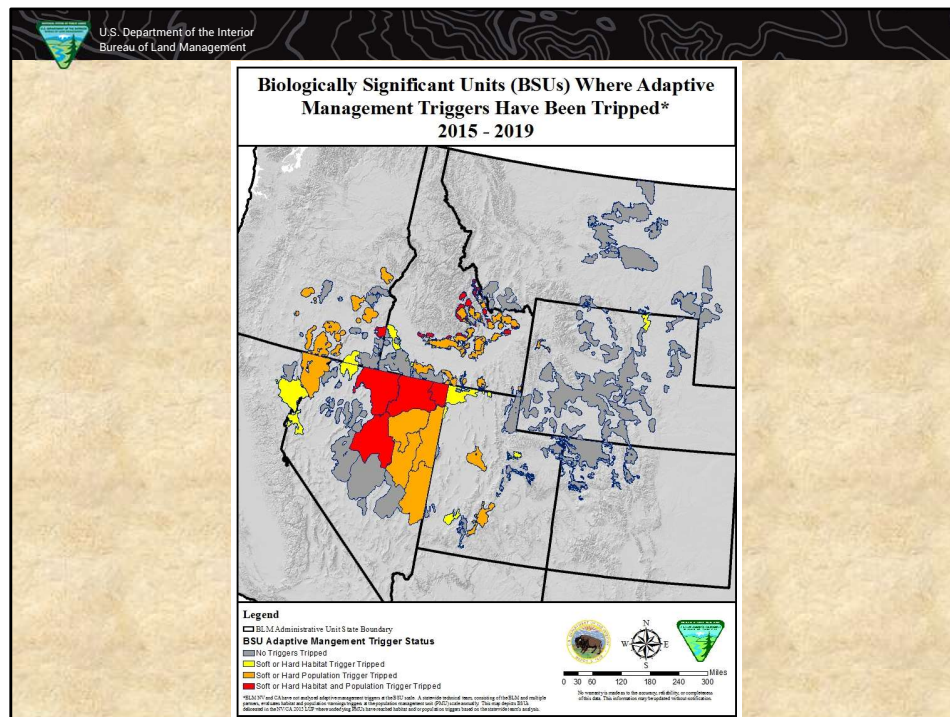
- This map illustrates which BSUs have had triggers tripped.
- Note that population and habitat trigger thresholds vary across each land use plan
- Multiple triggers can be tripped in a BSU
- NV BSUs have been cross-walked to the PMUs where triggers have tripped