

A Science Framework for Assessing Threats to Sagebrush Ecosystems and Greater Sage-grouse and Prioritizing Conservation and Restoration Actions



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Schedule

Evaluating species management guidance and monitoring programs for the Great Basin - June 25 at 1:00 PM (PDT)

Speaker: [Dr. John Boone, Great Basin Bird Observatory](#)



Species-based wildlife management in Nevada's Great Basin is conducted by multiple agencies using a diverse array of guidelines, protocols and information sets, many of which are outdated, incomplete or inconsistent. The first step of this project is to review the basis for species management in Nevada—focusing on a core set of avian species—to identify where opportunities for improvement exist. We then develop an array of both generalized and species-specific recommendations for more consistent and effective species management. These recommendations stress the use of monitoring data and incorporation of new information regarding disturbance buffers.

- Watch the [webinar recording](#)
- View the [presentation slides](#)
- Learn more about the [project](#)

Cheatgrass die-offs as an opportunity for restoration - July 14 at 1:00 PM (PDT)

Speaker: [Caren Dewberry, University of Nevada, Reno](#)

9:43 AM 8/17/2015

Talking: Envirolssues Inc.



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Speaker: [Chris Beaudoin, University of Nevada, Reno](#)

9:44 AM 8/17/2015

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Handouts - 0

Questions

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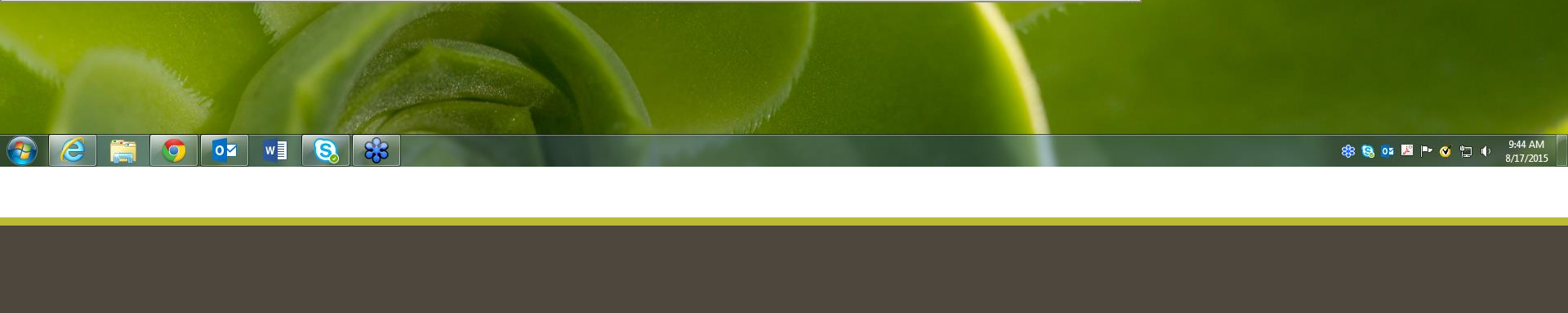

How will these data be incorporated with land managers?

Send

TEST: Cheatgrass die-offs as an opportunity for restoration

Webinar ID: 150-816-931

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Speaker: [Curtis Donath, University of Nevada, Reno](#)

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A Science Framework for Assessing Threats to Sagebrush Ecosystems and Greater Sage-grouse and Prioritizing Conservation and Restoration Actions





THE SECRETARY OF THE INTERIOR
WASHINGTON

ORDER NO. 3336

Subject: Rangeland Fire Prevention, Management and Restoration

Sec. 1 Purpose. This Order sets forth enhanced policies and strategies for preventing and suppressing rangeland fire and for restoring sagebrush landscapes impacted by fire across the West. These actions are essential for conserving habitat for the greater sage-grouse as well as other wildlife species and economic activity, such as ranching and recreation, associated with the sagebrush-steppe ecosystem in the Great Basin region. This effort will build upon the experience and success of addressing rangeland fire, and broader wildland fire prevention, suppression and restoration efforts to date, including the National Cohesive Wildland Fire Management Strategy, and ensure improved coordination with local, state, tribal, and regional efforts to address the threat of rangeland fire at a landscape-level.

Conservation & Restoration Strategy Action Item 7b iv



AN INTEGRATED RANGELAND FIRE MANAGEMENT STRATEGY

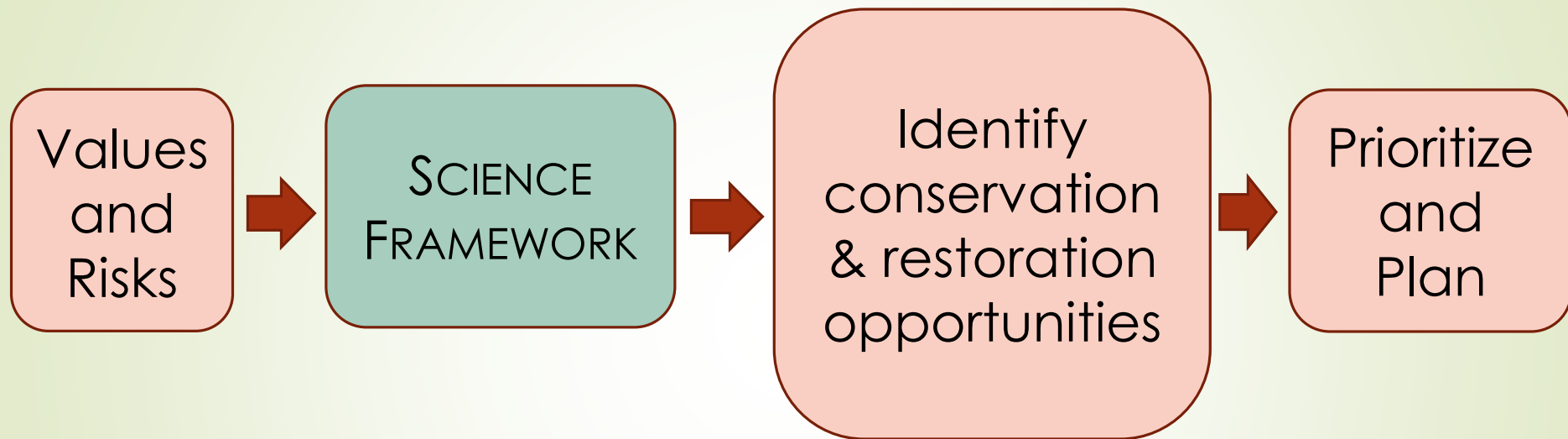


Final Report to the Secretary of the Interior

May 2015

- Guide the development of scientific information and tools for prioritizing areas for management
- Inform options for management activities across scales
- Provide clear linkages to existing assessments and plans
- Inform budget prioritization and adaptive management

Science Framework for the C&R Strategy



The Science Framework provides a holistic, science-based foundation for assessing resource values and threats across scales in the sagebrush biome

Science Framework Linkages

The Science Framework is linked to several SO 3336 components & multiple working groups

- Sagebrush ecosystems & sage-grouse
 - Invasive species (7bvii)
 - Restoration (7b v & vi)
- Fire & fuels management and suppression (7b i, ii, &iii)
- Climate change (new)
- Seed strategy (7 b ix)
- Actionable science plan (7 b viii)
- Monitoring (Crosscut #3)
- Data & geospatial (Crosscut #2)
- ❖ Mitigation



GRSG Mitigation Strategy

- ▶ Promote a consistent approach in determining mitigation requirements across the range of the species
- ▶ Use best available science in prioritizing mitigation locations at landscape scales
- ▶ Inform mitigation strategies at project scales
- ❖ *The Science Framework can inform these goals by providing a process, data, layers, and models to help managers and specialists target areas for mitigation activities and determine appropriate management strategies*

The Science Basis – Resilience and Resistance

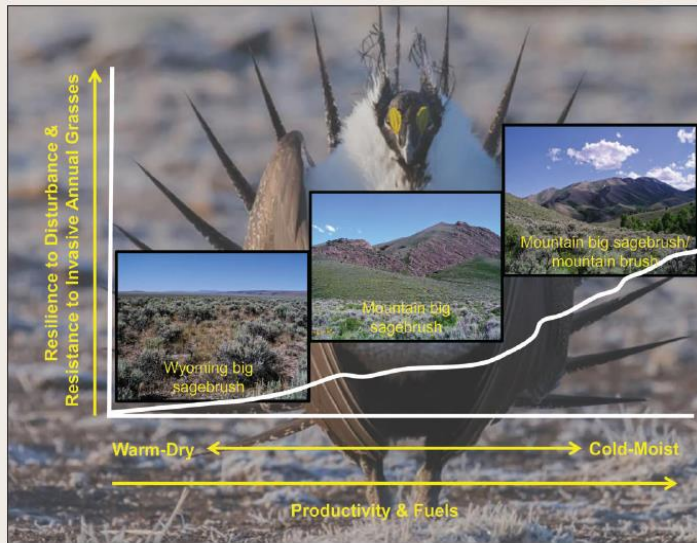
Two WAFWA Working Groups

USDA
United States Department of Agriculture

2014

Using Resistance and Resilience Concepts to Reduce Impacts of Invasive Annual Grasses and Altered Fire Regimes on the Sagebrush Ecosystem and Greater Sage-Grouse: A Strategic Multi-Scale Approach

Jeanne C. Chambers, David A. Pyke, Jeremy D. Maestas, Mike Pellant, Chad S. Boyd, Steven B. Campbell, Shawn Espinosa, Douglas W. Havlina, Kenneth E. Mayer, and Amarina Wuenschel

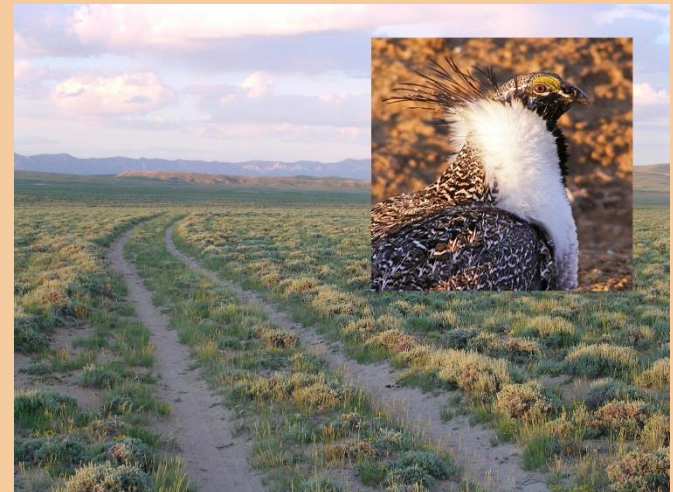


Forest Service Rocky Mountain Research Station General Technical Report RMRS-GTR-326 September 2014

2016

Using Resilience and Resistance Concepts to Manage Threats to Sagebrush Ecosystems, Gunnison Sage-Grouse, and Greater Sage-Grouse in their Eastern Range: A Strategic Multi-Scale Approach

Jeanne C. Chambers, Jeffrey L. Beck, Steve Campbell, John Carlson, Thomas J. Christiansen, Karen J. Clause, Jonathan B. Dinkins, Kevin E. Doherty, Kathleen A. Griffin, Douglas W. Havlina, Kenneth F. Henke, Jacob D. Hennig, Laurie L. Kurth, Jeremy D. Maestas, Mary Manning, Kenneth E. Mayer, Brian A. Mealor, Clinton McCarthy, Marco A. Perea, David A. Pyke



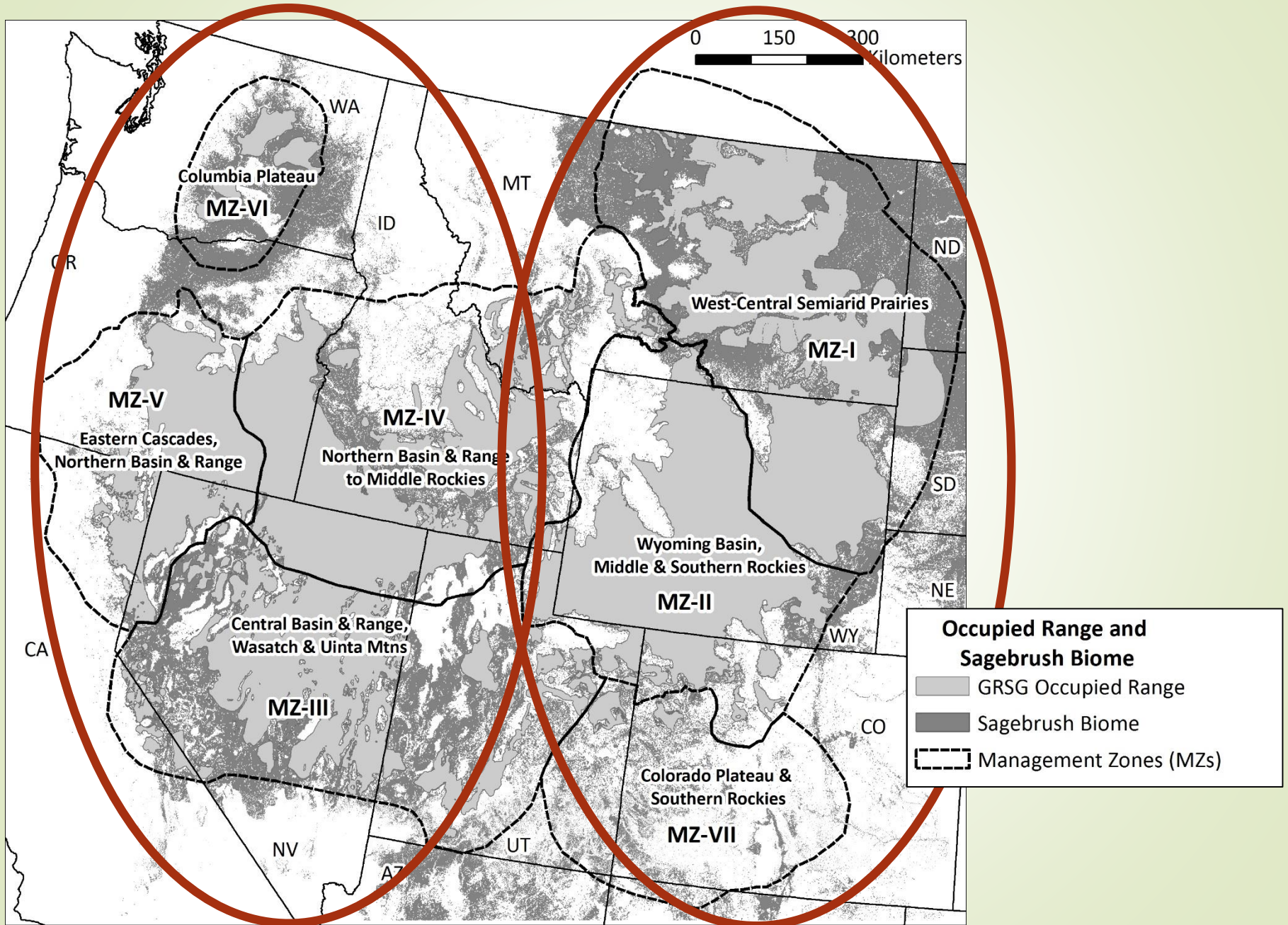


Scope

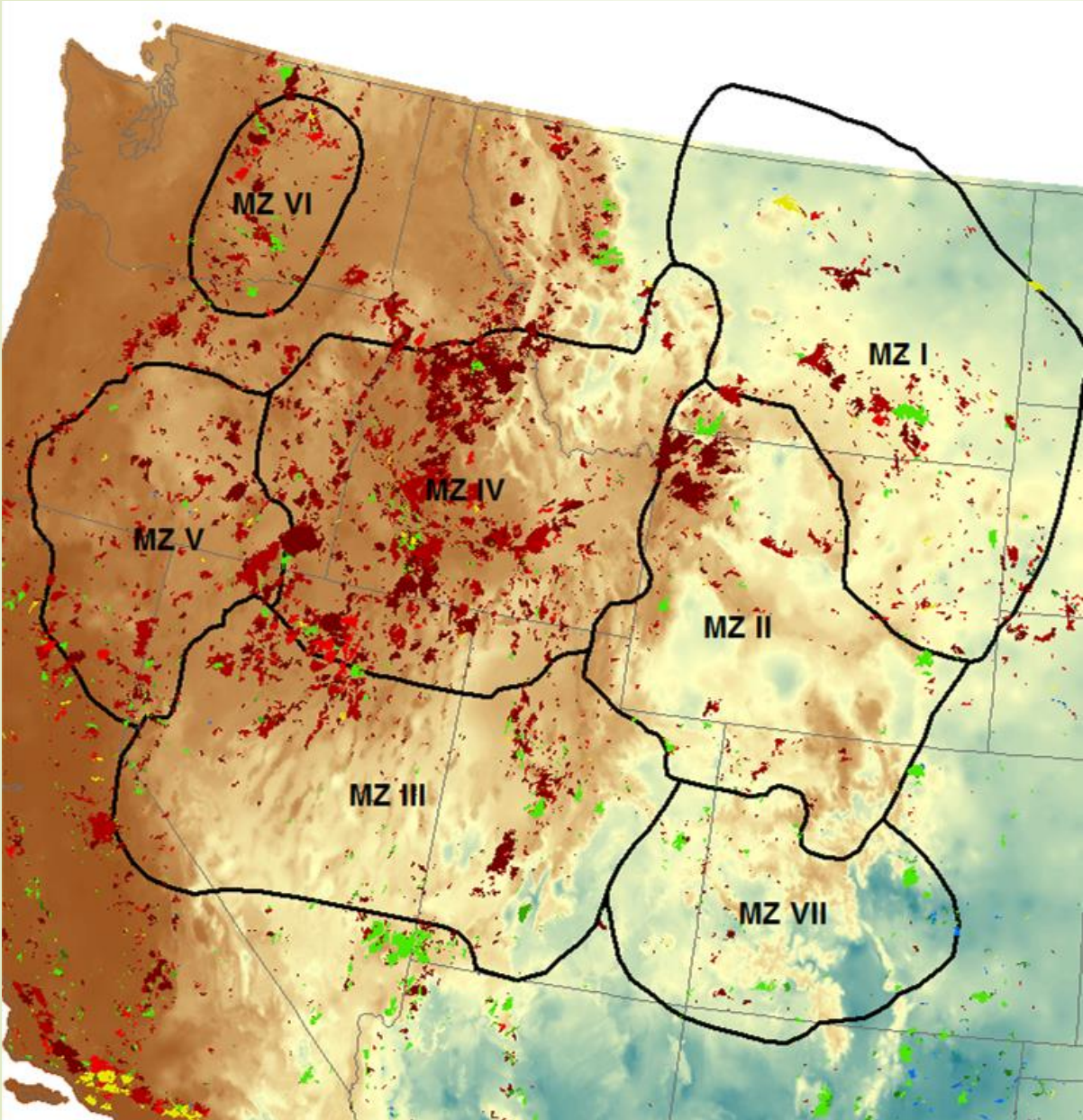
The Science Framework is being designed to address a variety of resources and values

- ▶ Primary emphasis - sagebrush ecosystems and greater sage-grouse populations
- ▶ Subsequent versions -
 - Passerines, reptiles, and other species at risk identified by the WAFWA & FWS Sagebrush Science Initiative
 - Greater sage-grouse brood rearing habitat
 - Big game migratory corridors & seasonal habitat
 - Riparian areas & cultural values
 - Other

Ecoregions and Management Zones



Environmental Differences

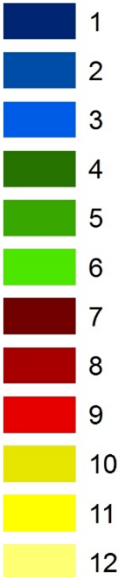


Management Zones

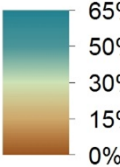


Wild Fires 2000-2013

Month of Start



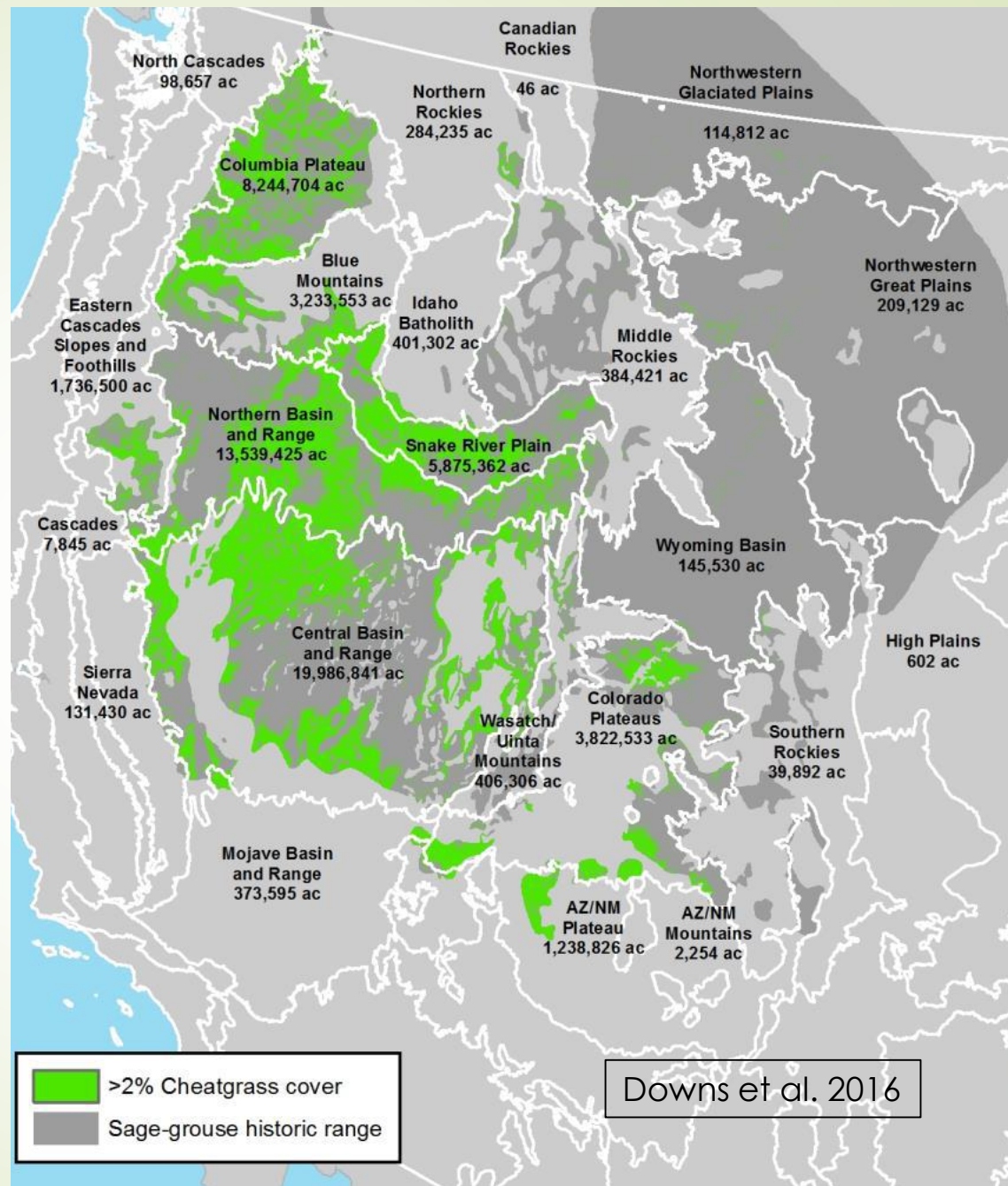
% Summer Rain



Threats to Sagebrush Ecosystems

Persistent Ecosystem Threats

- Invasive Annual Grasses
 - Conifer Expansion
 - Altered Fire Regimes
- ❖ Identified in Conservation Objectives Team Report (2013)



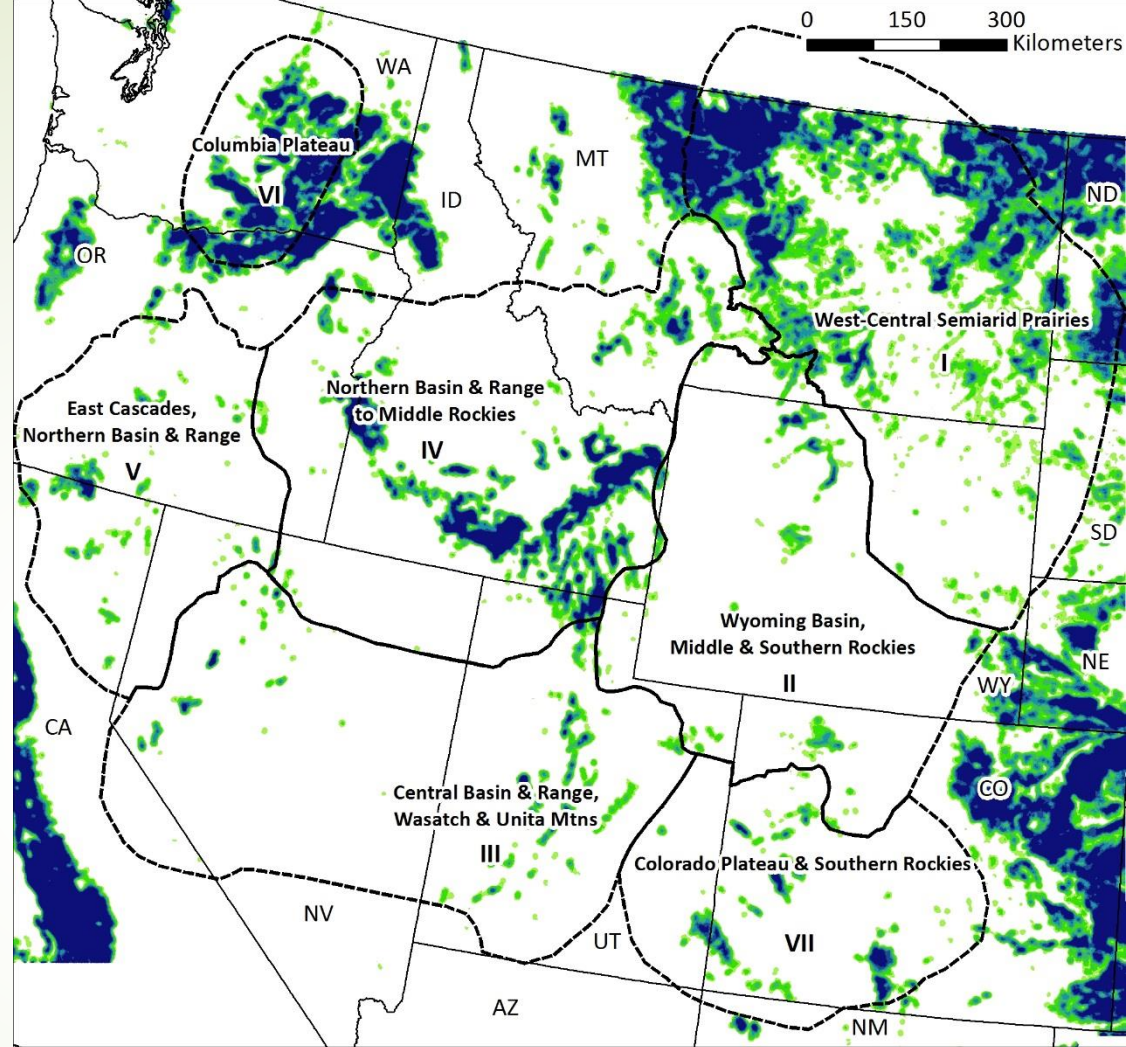
Threats to Sagebrush Ecosystems

Land Use & Development Threats

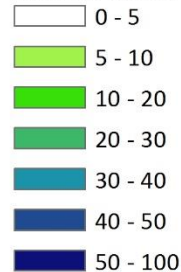
- Cropland Conversion
- Oil and Gas Development
- Exurban Development
- Improper Livestock Grazing
- Recreation

Climate Change

- Effects on Ecosystems and Species





Percent Tilled Agriculture



Management Zones (MZs)

A Strategic, Multi-Scale Approach

Scale/Area	Data/Tools/Models*	Process
	Scale-Dependent/Additive	
Sagebrush Biome	Vegetation Soils Population data and models Fire and other threat data Climate change projections	 Budget prioritization within DOI for rangewide consistency
Sage-Grouse MZs and Ecoregions	Above + Assessments & Planning Docs Regional Data/Models/Tools	Assessments to prioritize planning areas
Local planning areas	Above + Local Data & Models	 Selection of treatments within priority planning areas

*USFS, NRCS, USGS, BLM, WAFWA, FWS, NGOs, States, etc.



Components of a Strategic, Multi-Scale Approach

Six Components

- 1) Develop an understanding of ecosystem resilience and resistance for the planning region
- 2) Identify key habitat indicators
- 3) Develop management decision matrices
- 4) Assess key threats in planning area
- 5) Delineate focal habitats/areas for management
- 6) Determine the most appropriate management approach

Environmental Gradients Cold Deserts



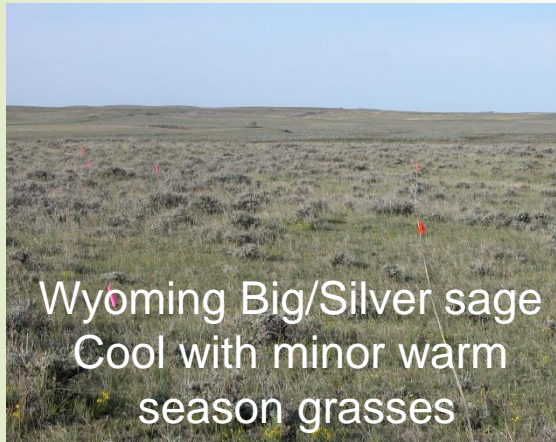
Chambers 2005,
Chambers et al. 2007,
Wisdom & Chambers 2009;
Brooks & Chambers 2011;
Condon et al. 2011;
Chambers et al. 2014a,b

Warm-Dry to
Warm-Dry bordering
on Summer Moist

Cold-Wet to
Cold- Summer Moist

Productivity

Environmental Gradients West-Central Semiarid Prairies



Chambers et al. in press

Warm-Summer Moist ←

→ Cold-Summer Moist

Productivity →

RESILIENCE & RESISTANCE OF ECOLOGICAL TYPES

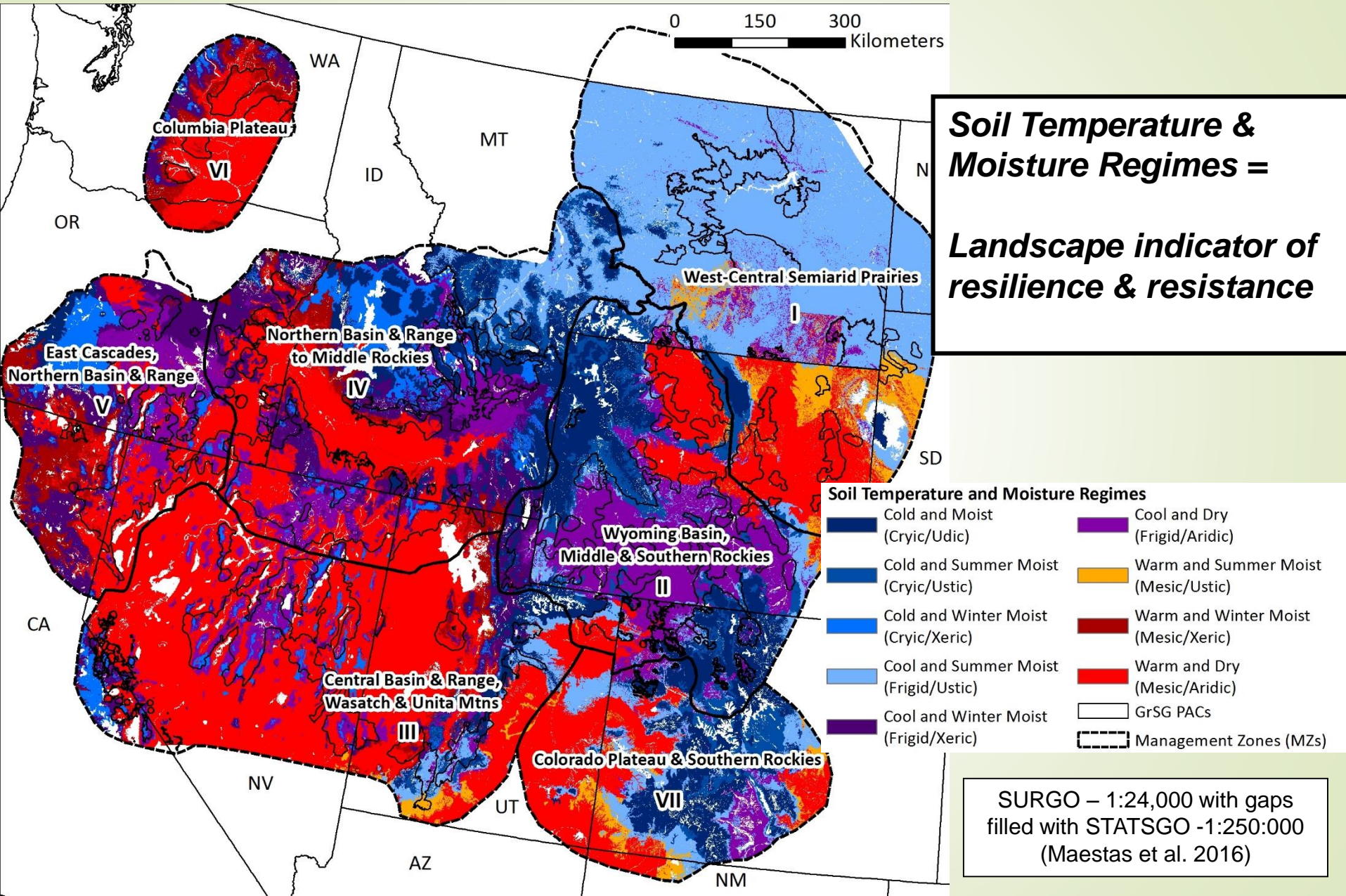
Relative Resilience & Resistance

High

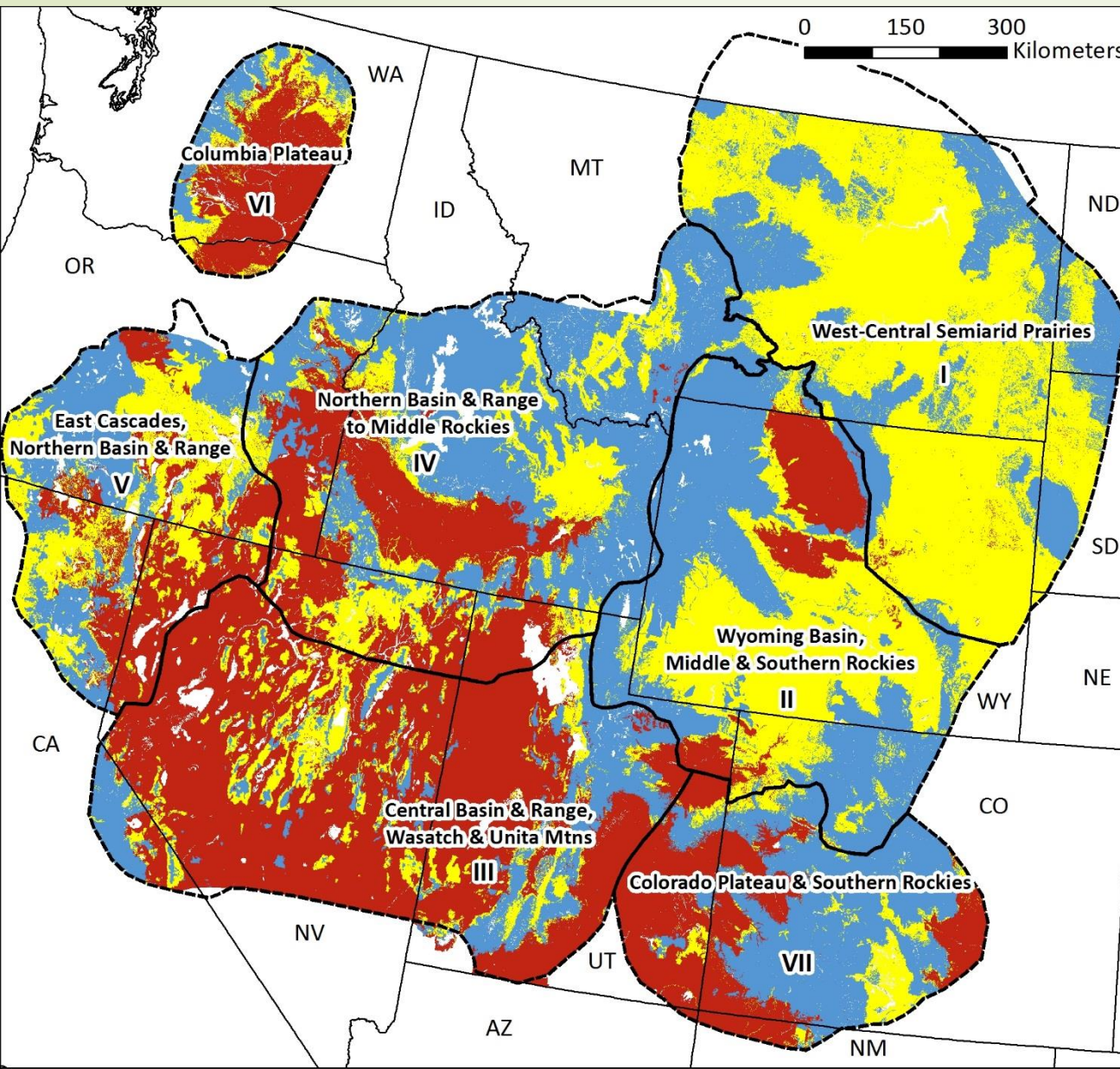
Low

Ecological Type	Characteristics	Resilience and resistance
Cold & Moist <i>Cryic (all)</i>	Ppt: 15-20+' Typical shrubs: Mountain big sagebrush, snowberry, serviceberry. silver sagebrush. Cool season bunch grasses	Resilience – High Resistance – High
Cool & Summer Moist <i>Frigid/Ustic</i>	Ppt: 12-22" Typical shrubs: Mountain big sagebrush, bitterbrush, snowberry. Cool season grasses Piñon pine and juniper potential	Resilience – Moderate to high Resistance – Moderate to high
Cool & Summer moist to dry <i>Frigid/Ustic-Aridic</i>	Ppt: 12-16" Typical shrubs: Wyoming big sagebrush with basin big and silver sagebrush in drainages. Cool season grasses with some warm season grasses Piñon pine and juniper potential	Resilience – Moderate Resistance – Moderate
Warm & Summer moist to dry <i>Xeric/Ustic-Aridic</i>	Ppt: 10-14" Typical shrubs: Wyoming big sagebrush, fourwing saltbush. Cool season grasses with some warm season grasses Piñon pine and juniper potential	Resilience – Moderate to Low Resistance – Low
Warm & Dry <i>Mesic/Aridic</i>	Ppt: 5-9" Typical shrubs: Wyoming big sagebrush, salt desert shrubs. Cool season grasses with some warm season grasses.	Resilience – Moderate to Low Resistance – Low

Soil Temperature & Moisture Regimes



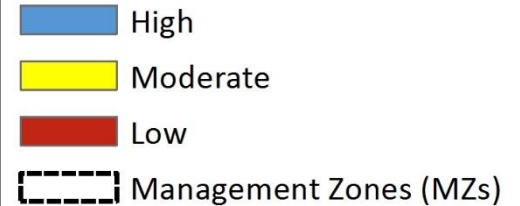
Resilience & Resistance Classes



Soil Temperature & Moisture Regimes =

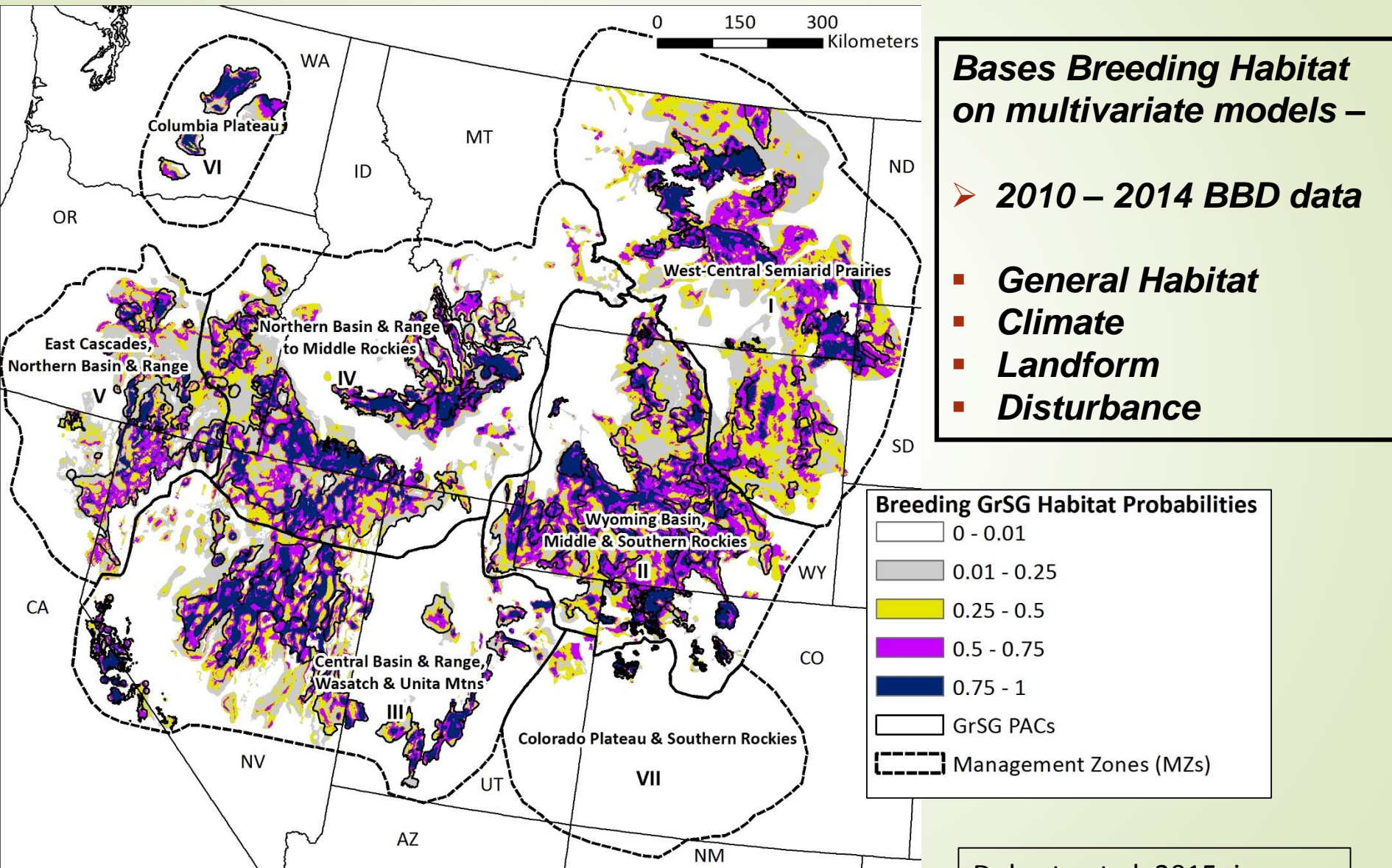
Landscape indicator of resilience & resistance

Resistance and Resilience



SURGO – 1:24,000 with gaps filled with STATSGO -1:250:000 (Campbell & Maestas 2016, Maestas et al. 2016)

Sage-grouse Breeding Habitat Probabilities



Sage-Grouse Habitat Matrix

Probability of Sage-Grouse Breeding Habitat

Sagebrush Ecosystem Resilience & Resistance

Low (0.25-0.50)
Landscape context is likely limiting - significant restoration may be needed.

Medium (0.5-0.75)
Landscape context may be affecting habitat suitability – improve with management.

High (> 0.75)
Landscape context is highly suitable - maintain and enhance resilience & resistance.



High

RESTORATION/RECOVERY POTENTIAL HIGH

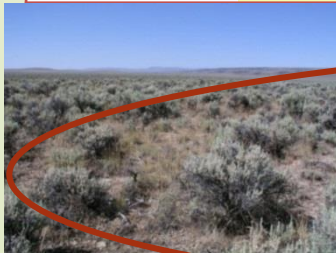
*Native grasses and forbs sufficient for recovery
Annual invasive risk low; Conifer expansion is a local issue
Seeding success is typically high*



Moderate

RESTORATION/RECOVERY POTENTIAL INTERMEDIATE

*Native grasses and forbs usually adequate for recovery
Annual invasive risk moderate; Conifer expansion is a local issue
Treatment success depends on site characteristics*



Low

RESTORATION/RECOVERY POTENTIAL LOW

*Native grasses and forbs inadequate for recovery
Annual invasive risk is high
Seeding success depends on site characteristics, invasives & ppt
May require multiple management interventions*

Sage-Grouse Habitat Matrix

Probability of Sage-Grouse Breeding Habitat

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Seeding success is typically high*



Moderate

RESTORATION/RECOVERY POTENTIAL INTERMEDIATE
*Native grasses and forbs usually adequate for recovery
Annual invasive risk moderate; Conifer expansion is a local issue
Treatment success depends on site characteristics*



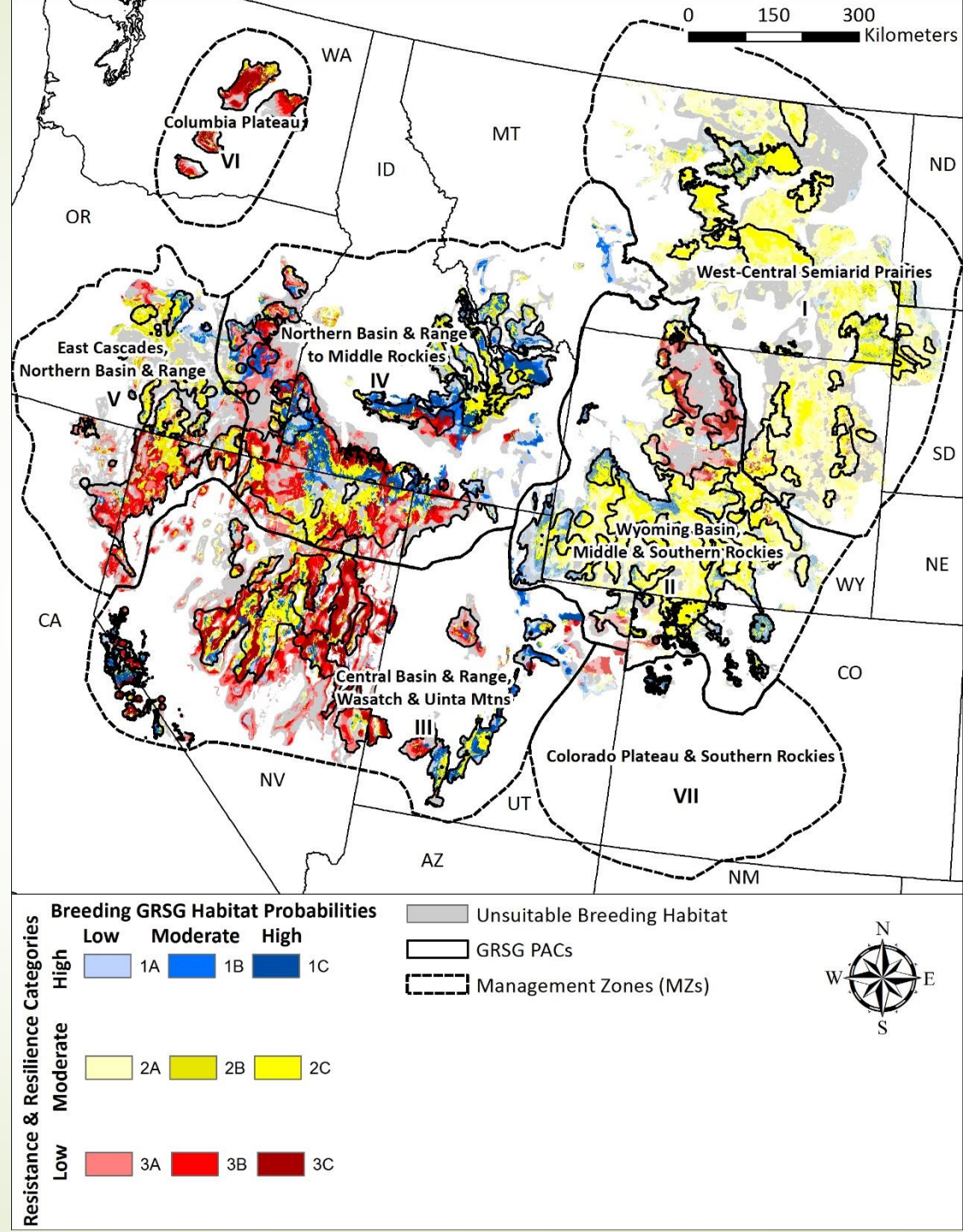
Low

RESTORATION/RECOVERY POTENTIAL LOW
*Native grasses and forbs inadequate for recovery
Annual invasive risk is high
Seeding success depends on site characteristics, invasives & ppt
May require multiple management interventions*

Map of GRSG Habitat Matrix

Areas for targeted management –

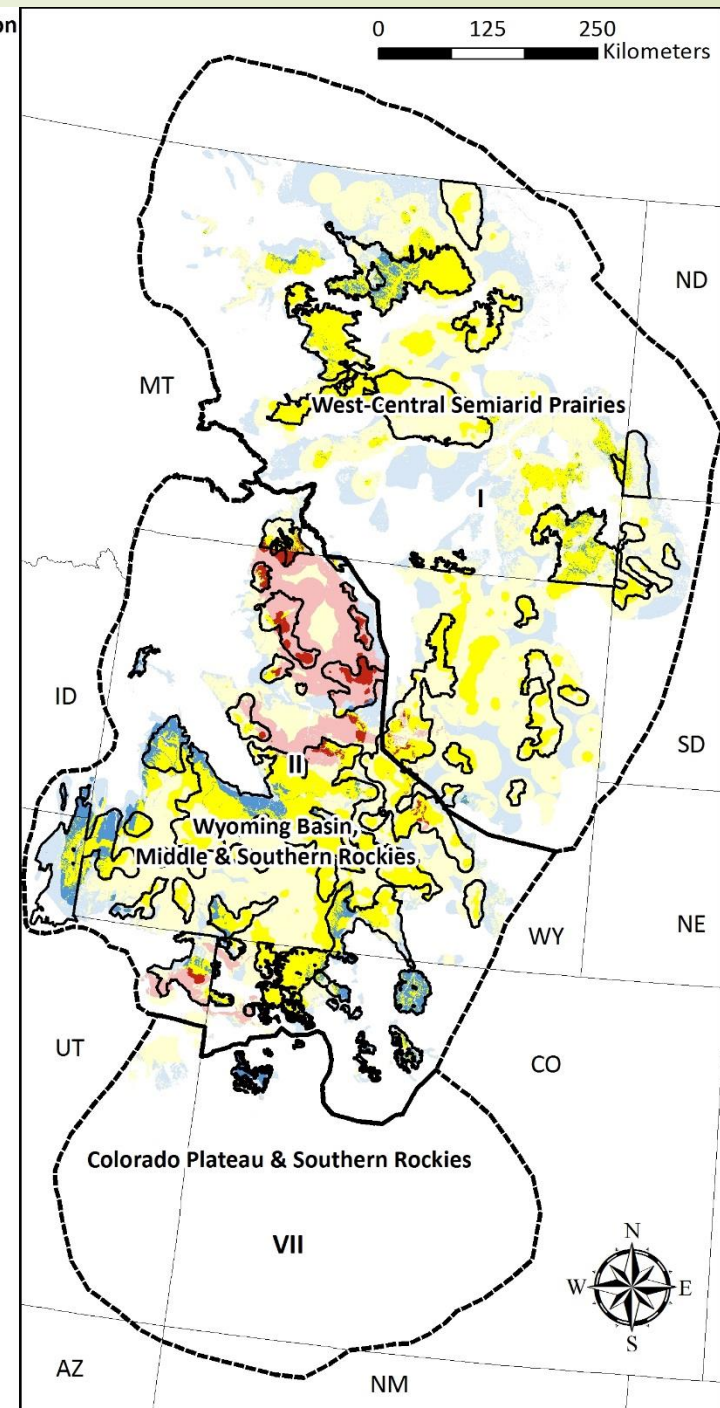
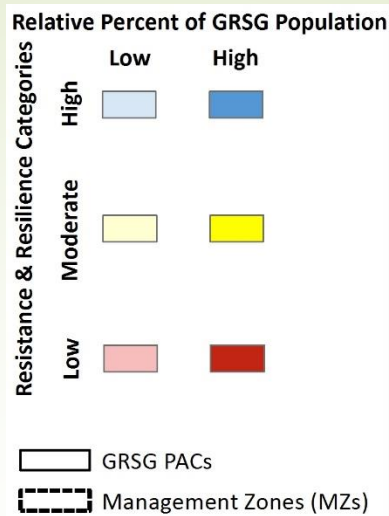
- First filters – GRSG PACS developed by States
- Resilience & Resistance
- Sage-grouse breeding habitat probabilities (Doherty et al. 2015)
- Management strategies can be matched directly to the Matrix



R&R PLUS Breeding Populations

Areas for targeted management –

- First filters – GRSG PACS
- Resilience & Resistance
- Breeding bird densities (High density = areas with 80% BBD (Doherty et al. 2015))
- Ensures management areas -
 1. Support large populations
 2. Provide connectivity
 3. Are close enough to breeding centers for recolonization



Stepping Down to the Land Planning Unit

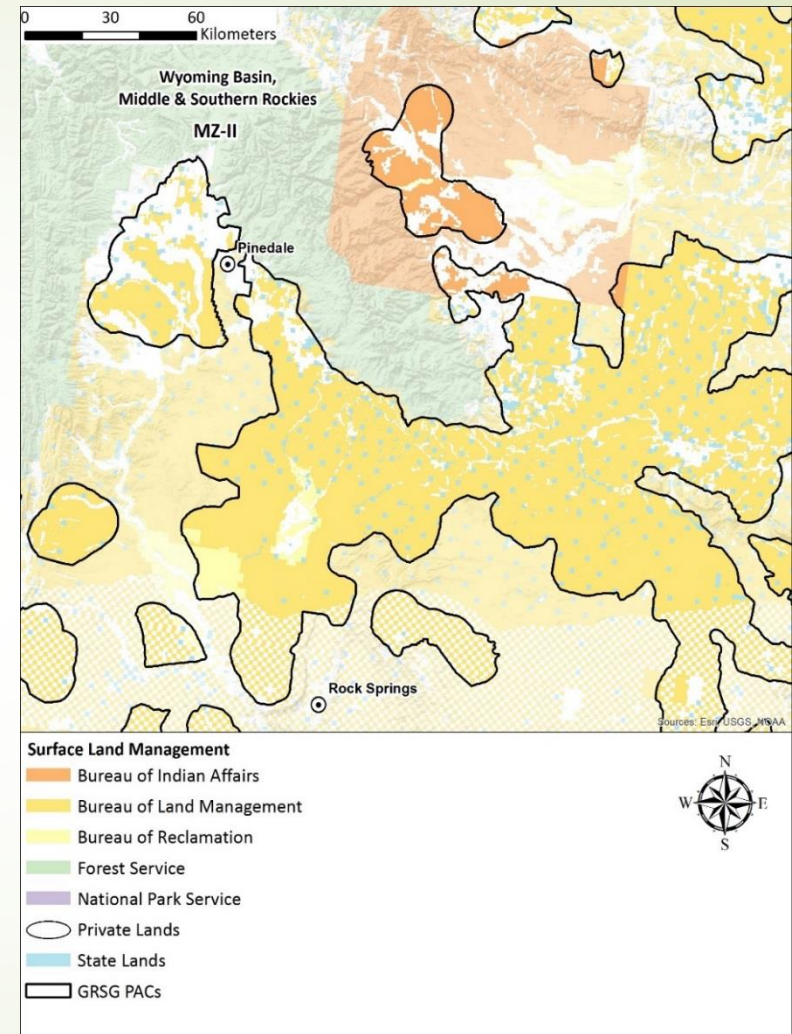
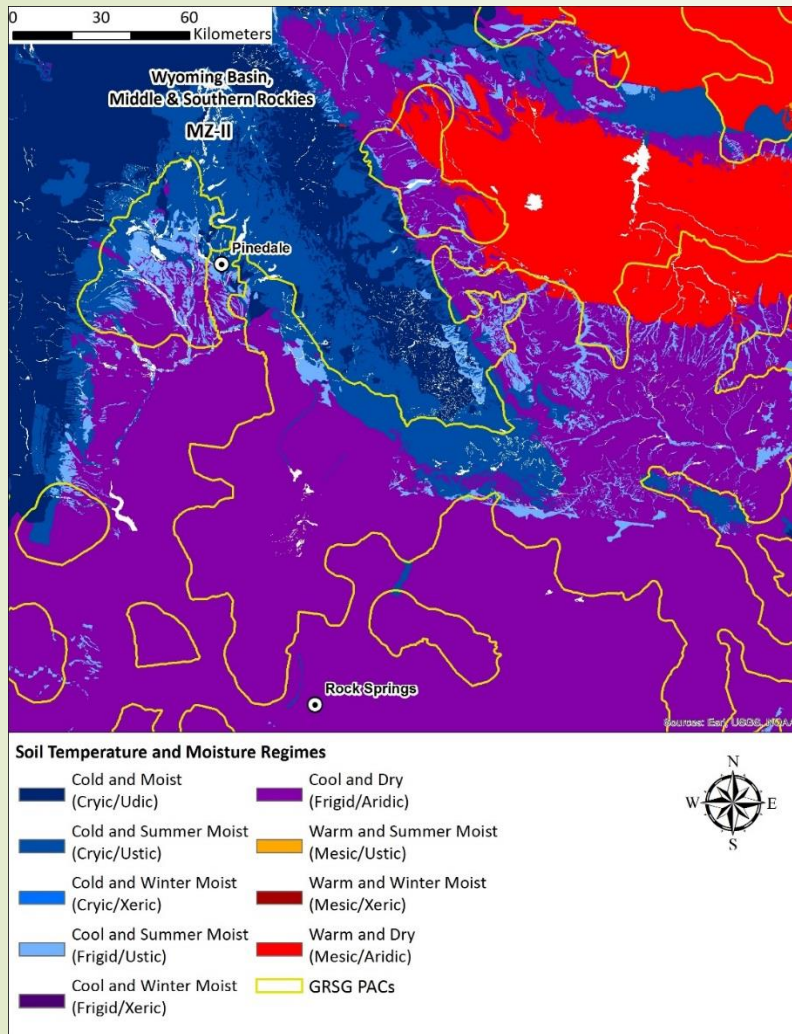
Management activities based on -

- Resilience & resistance
- Breeding habitat probabilities
- Sage-grouse breeding populations

- + Dominant threats
- + Regional risk models
- + Finer scale data
- Regional/local expertise



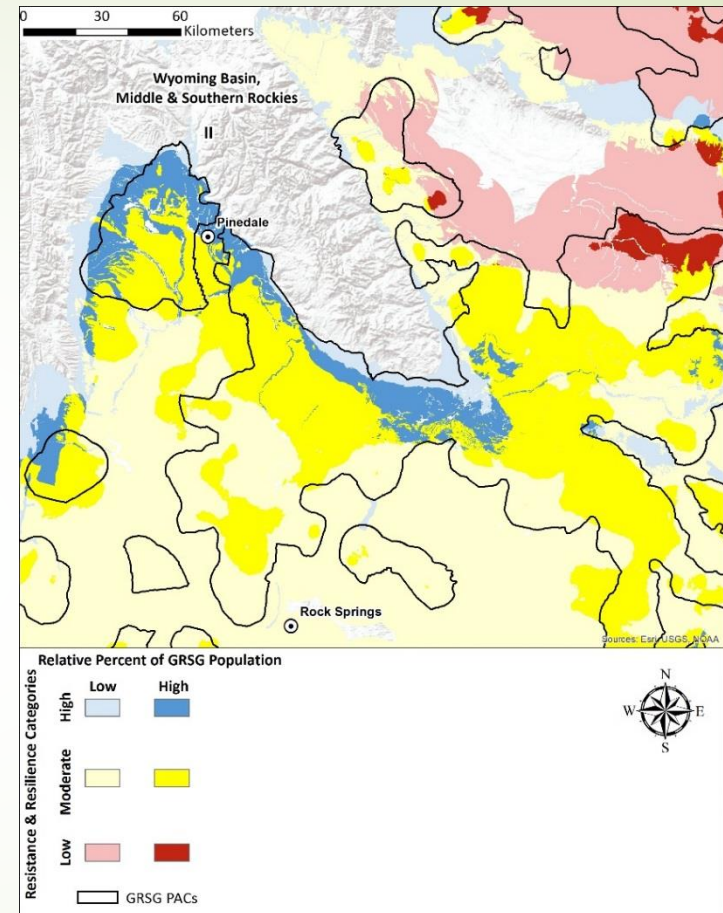
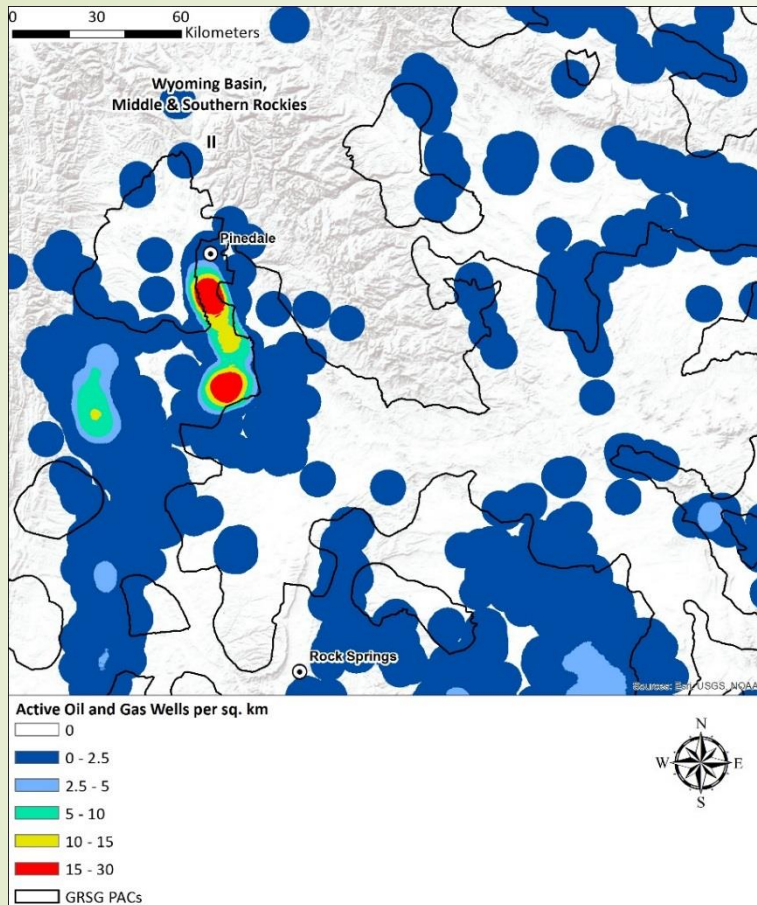
Southwestern WY – Oil & Gas Development



Physical Setting and Land Ownership

- Cold and moist (high R&R) to warm and dry bordering on summer moist (Low R&R)
- BLM, State, Private, BIA

Southwestern WY – Oil & Gas Development



Oil & Gas development, R&R, and BBD

- Active oil and gas development
- Large parts of the area have high BBD with moderate to low R&R in and adjacent to oil wells

Southwestern WY – Oil & Gas Development

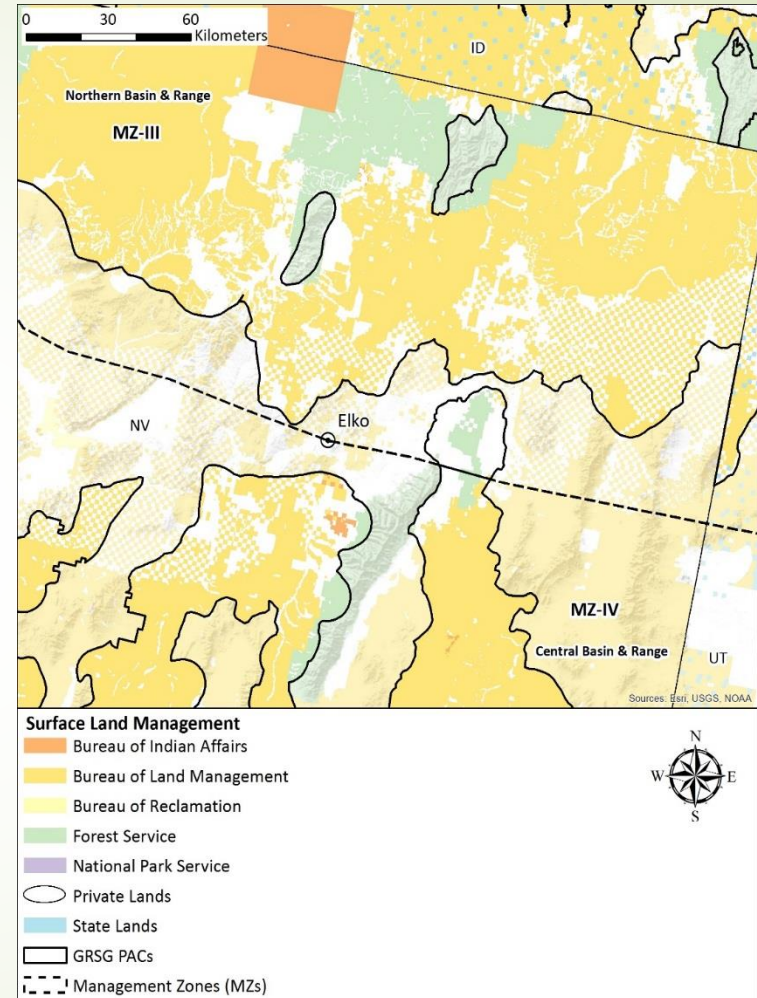
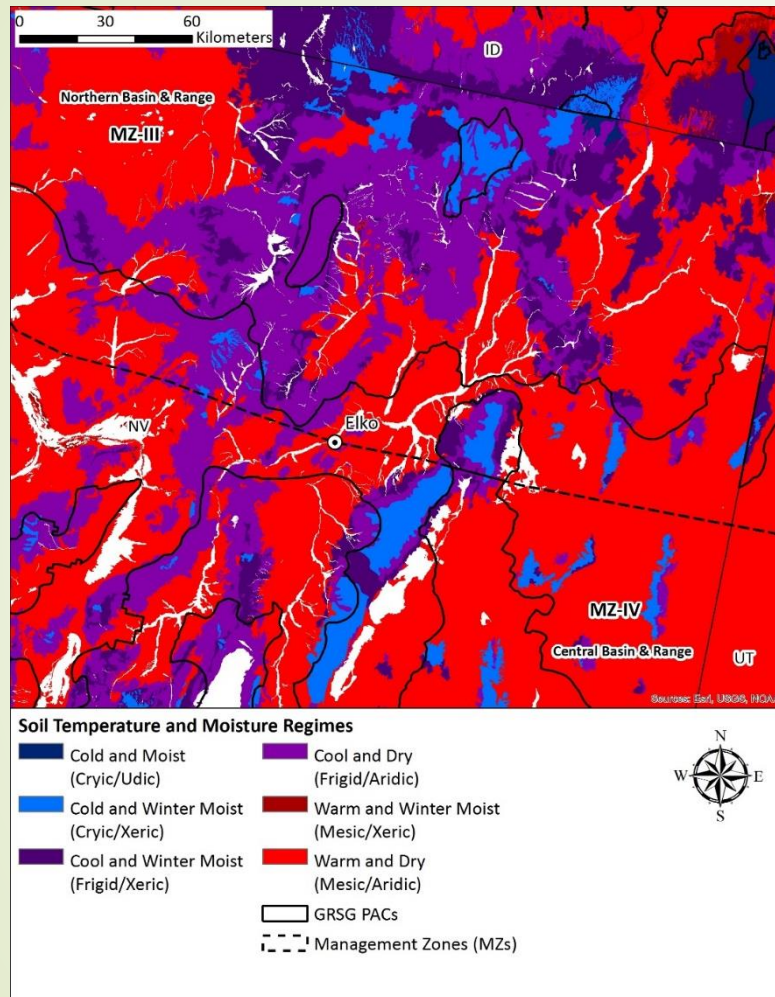
Management strategies -

- A.** Avoid development & transportation corridors in areas with high pops
- B.** Use Early Detection & Rapid Response for invasive plants
- C.** Improve grazing management, especially in lower R&R areas
- D.** Use best restoration practices (weed-free seed, etc.)



Photo by Jeremy Roberts

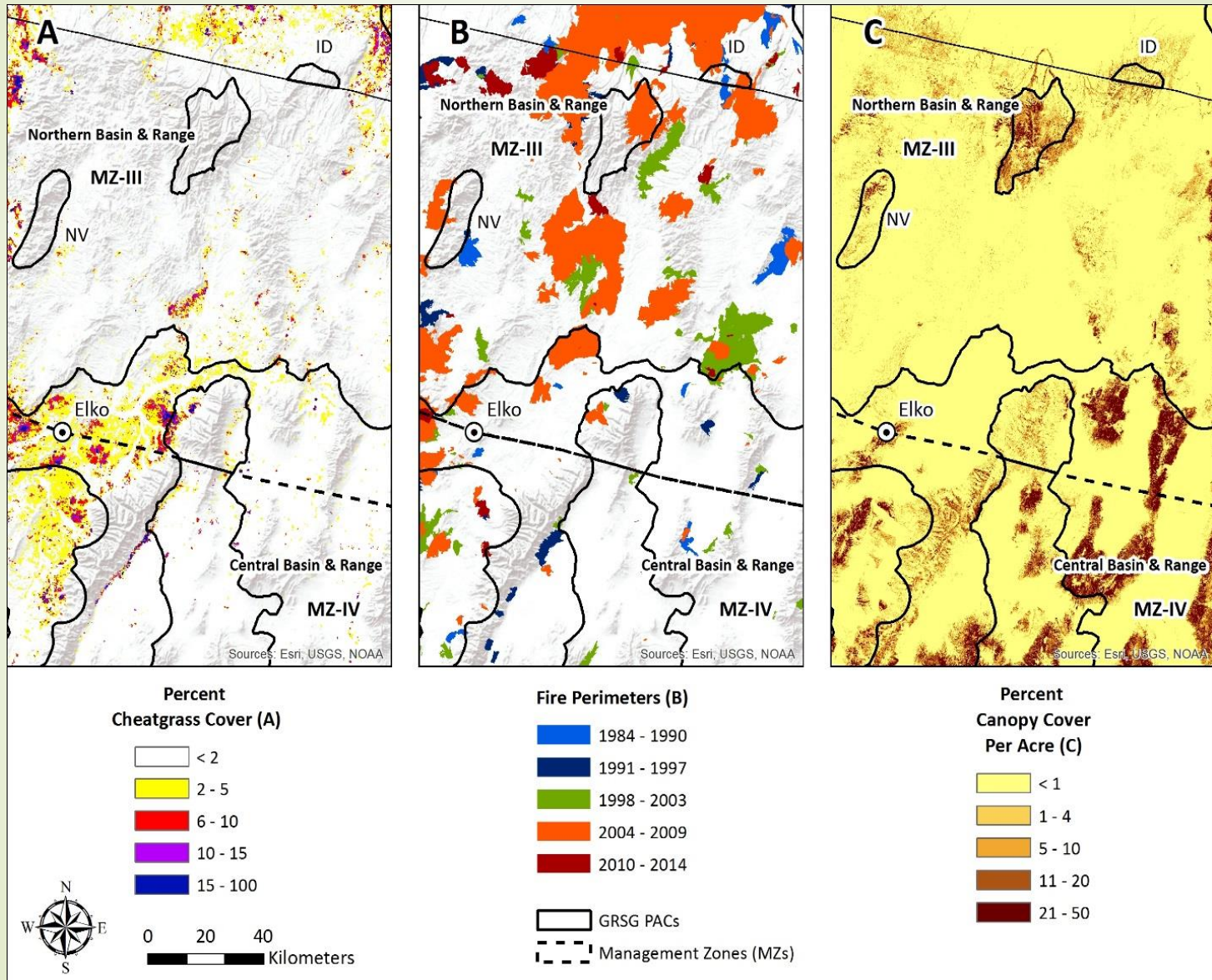
Northeast Nevada – Invasives, Fire, Conifers



Physical Setting and Land Ownership

- Cold and moist (high R&R) to warm and dry (Low R&R)
- BLM, Forest Service, State, Private

Northeast Nevada – Invasives, Fire, Conifers

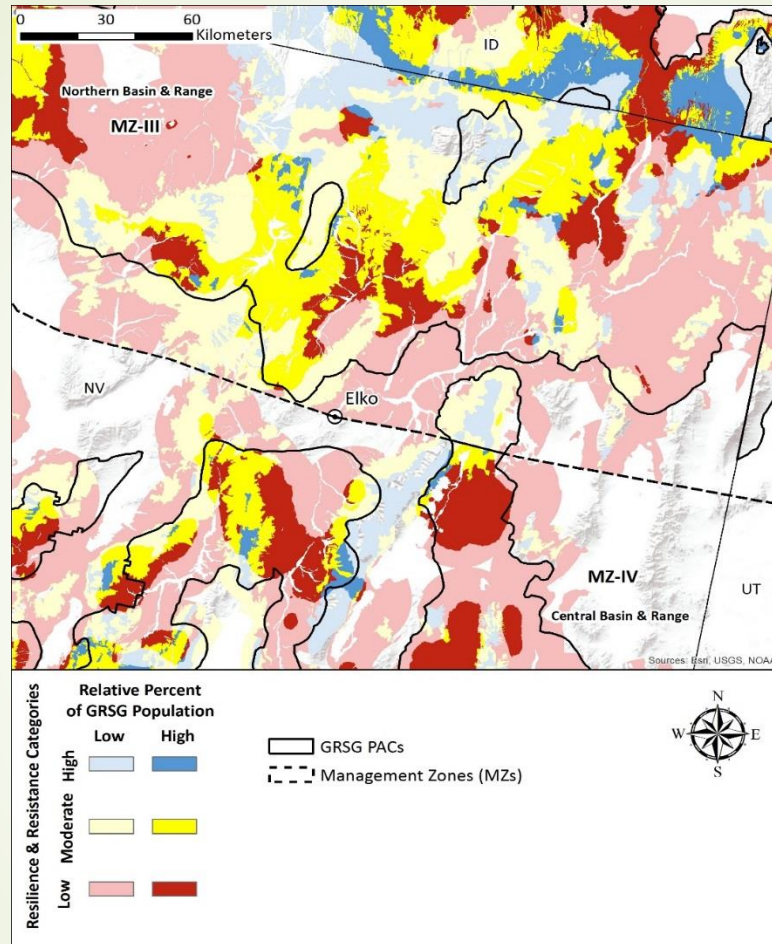


Boyte et al. 2015

MTBS 2014

Fallkowski et al. in press

Northeast Nevada – Invasives, Fire, Conifers



Persistent Ecosystem Threats, R&R, and BBD

- Areas within the PACs with high breeding bird densities occur over a broad range of R&R

Northeast Nevada – Invasives, Fire, Conifers

Management strategies -

- A. Strategic fire suppression and fuels management
- B. Targeted tree removal in Phase I and II expansion areas
- C. Post-fire rehabilitation that promotes native perennial grasses & forbs
- D. Livestock management that helps maintain native perennial herbs





United States
Department of
Agriculture
Forest Service
Rocky Mountain
Research Station
General Technical
Report RMRS-GTR-322
June 2014

A Field Guide for Selecting the Most Appropriate Treatment in Sagebrush and Piñon-Juniper Ecosystems in the Great Basin

Evaluating Resilience to Disturbance and Resistance to Invasive Annual Grasses, and Predicting Vegetation Response

Richard F. Miller, Jeanne C. Chambers, and Mike Pellant



Warm and dry Wyoming big sagebrush—Invaded State

Cool and dry mountain big sagebrush—Reference State

Information & Tools for Managers

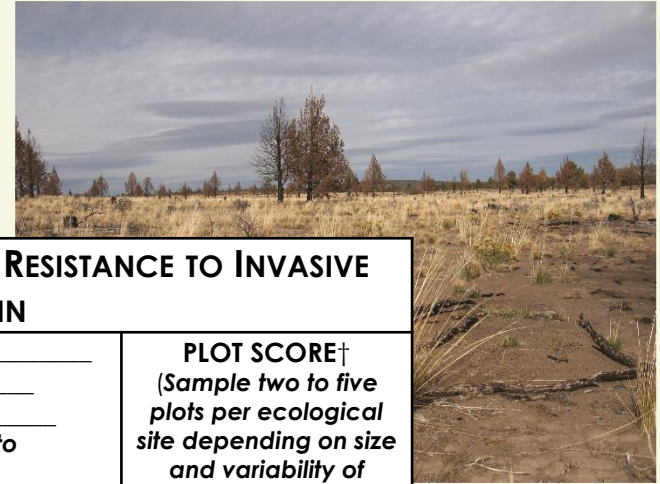


United States Department of Agriculture

A Field Guide for Rapid Assessment of Post-Wildfire Recovery Potential in Sagebrush and Piñon-Juniper Ecosystems in the Great Basin

Evaluating Resilience to Disturbance and Resistance to Invasive Annual Grasses and Predicting Vegetation Response

Richard F. Miller, Jeanne C. Chambers, and Mike Pellant



SCORE SHEET FOR RATING RESILIENCE TO DISTURBANCE AND RESISTANCE TO INVASIVE ANNUAL GRASSES IN THE GREAT BASIN

Ecological Site or Type Name: _____		PLOT SCORE† <i>(Sample two to five plots per ecological site depending on size and variability of area.)</i>				
%Area: _____ UTM: _____ <i>(Use ecological site descriptions or guidelines for the MLRA with field assessment to complete score sheet.)</i>						
SITE CHARACTERISTICS	SCORE FOR VARIABLE	1	2	3	4	5
Temperature (Soil temperature regime + Species or subspecies of sagebrush)						
Soil temperature regime	1=hot-mesic, 2=warm-mesic, 3=cool-mesic, or cool-cryic (resilience is low but resistance is high), 4=warm-frigid, 5=cool-frigid, 6=warm-cryic					
Species or subspecies of sagebrush	1=Wyoming, low, black, or Lahontan; 2=basin, Bonneville, or xeric; 3=mountain					
A. Temperature Score =						
Moisture (Precipitation + Soil texture + Soil depth)						
Precipitation in inches (in)	1=<10, 2=10-12, 3=12-14, 4=>14					
Soil texture	1=clay, sand, or silt; 2=silty, sandy, or clay loams; 3=loam					
Soil depth in inches (in)	0=very shallow (<10), 1=shallow (10-20), 3=moderately deep to deep (>20)					
B. Moisture Score =						
Temperature Score (A)+ Moisture Score (B)						

General Technical Report
RMRS-GTR-338

July 2015



Prepared in cooperation with U.S. Joint Fire Science Program and National Interagency Fire Center, Bureau of Land Management, Great Northern Landscape Conservation, and Western Association of Fish and Wildlife Agencies

Restoration Handbook for Sagebrush Steppe Ecosystems with Emphasis on Greater Sage-Grouse Habitat— Part 1. Concepts for Understanding and Applying Restoration



Prepared in cooperation with U.S. Joint Fire Science Program and National Interagency Fire Center, Bureau of Land Management, Great Northern Landscape Conservation, and Western Association of Fish and Wildlife Agencies

Restoration Handbook for Sagebrush Steppe Ecosystems with Emphasis on Greater Sage-Grouse Habitat— Part 2. Landscape Level Restoration Decisions



Circular 1418

U.S. Department of the Interior
U.S. Geological Survey

Information & Tools for Managers



Tapping Soil Survey Information for Rapid Assessment of Sagebrush Ecosystem Resilience and Resistance

By Jeremy D. Maestas, Steven B. Campbell, Jeanne C. Chambers, Mike Pellant, and Richard F. Miller

On the Ground

Emerging applications of ecosystem resilience and resistance concepts in sagebrush ecosystems allow managers to better predict and mitigate impacts of wildfire and invasive annual grasses.

pressure from invasive species, like cheatgrass (*Bromus tectorum*). Resilience and resistance concepts help managers better understand key drivers of ecosystem change, identify relative risks of crossing thresholds to undesired states, and design appropriate management actions to promote desired ecosystem trajectories.

Great Basin Factsheet Series 2016

Information and tools to conserve and restore Great Basin ecosystems



Edited by Jeanne C. Chambers

Geospatial Portal and Decision Tools



Home

The **BLM's Landscape Approach** Data Portal is a one-stop source for **geospatial data, maps, models and reports** produced by BLM's landscape initiatives including the:

- Assessment, Inventory & Monitoring (AIM) strategy
- Fire & Invasives Assessment (FIAT) program
- Greater Sage-Grouse (GRSG)
- Rapid Ecoregional Assessments (REAs)
- Secretarial Order 3336, Integrated Rangeland Fire Management Strategy (SO3336).

To learn more about each initiative and the products that are available for them, click on the [images to the right](#) or the [tabs above](#). You can find products from all of these initiatives by using the [Search or Browse tabs](#) above.

On the Search page, enter any keyword(s) in the Text box or search by:

- Initiative — such as *AIM, FIAT, REA, or sage-grouse*
- Subject — such as *sage-grouse, soils, intactness*
- Place — such as *CO, Northern Great Basin*.

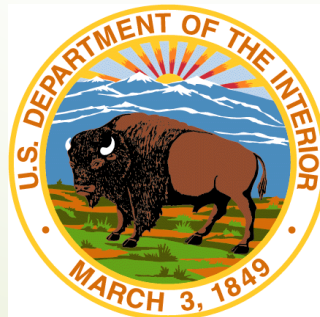
You can conduct [advanced searches](#) on the Search page such as filtering by content type (e.g., data, map, model) or geographic extent. You can even [search other data portals](#) simultaneously, including USGS Science Base, Data.gov, and ArcGIS Online. Click on this [How To...](#) link for instructions.

On the Browse page, simply click each header to expand the various categories. For example, you can browse by Content Type (data, maps, models) or a specific REA (e.g., Colorado Plateau REA).



<http://www.landscape.blm.gov/geoportal/>

Integrated Rangeland Fire Management Strategy Geospatial Framework





Cross-Cutting Action Item #2

- Develop and share a **geospatial tool** that highlights areas of concern and priority habitats in the Great Basin, including within priority greater sage-grouse habitat, particularly in areas identified using the FIAT.
- This tool will provide a **common framework** and common terminology to support the implementation of the Order.



Integrating Organizations through a Geospatial Framework


- Single landing page to numerous authoritative data sources
- Curated content
- Easy visualization and access
- Assistance to partners



Primary Building Blocks

- BLM Landscape Approach Data Portal
 - Landscape focused data
 - BLM Managed
 - <http://www.landscape.blm.gov/geoportal/>
- USGS ScienceBase
 - Data from project to landscape
 - Allows verified partners
 - Open Platform
 - <https://www.sciencebase.gov/>

Geospatial Framework Interface

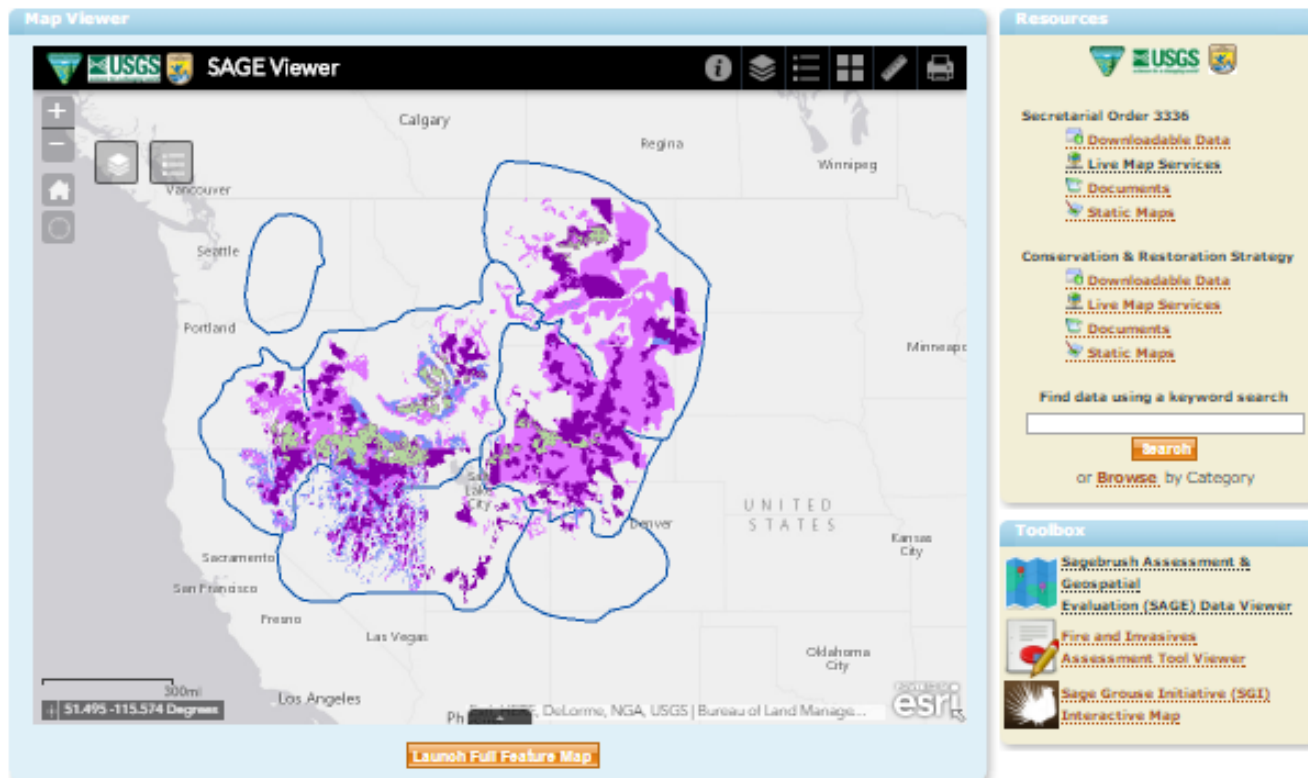


The header features a green and blue landscape background. On the left is the BLM logo. The main title is "Landscape Approach Data Portal" in large white font, with the subtitle "Data, Maps, and Models from BLM's Landscape Approach Initiatives" below it. On the right, there are links for "Help", "About", and "Feedback", and a yellow sticky note that says "NEWS!". Below the header is a dark green navigation bar with white text for "Home", "Search All", "Browse All", "AIM", "FIAT", "Greater Sage-Grouse", "REAs", "Secretarial Order 3336", and "How To".

Integrated Rangeland Fire Management Strategy Geospatial Framework ([Secretarial Order 3336](#))

The [Integrated Rangeland Fire Management Strategy](#) (the Strategy) sets in motion actions to enhance the protection, conservation, and restoration of a healthy sagebrush-steppe ecosystem, and to address important public safety, economic, cultural, and social concerns. The Strategy is intended to improve the efficiency and efficacy of actions to better prevent and suppress rangeland fire, and improve efforts to restore fire-impacted landscapes. Identification of geospatially-explicit management strategies will further efforts to conserve important greater sage-grouse habitats by limiting the likelihood of habitat loss due to fire and targeting management strategies to improve resilience. Geospatial tools and enhanced data sharing can provide a common framework to support the implementation of the Strategy.

This data portal provides access to data layers, map viewers, and analytical tools to support the Strategy. This catalog of data layers is a curated list of datasets developed through an interagency collaborative process, and includes information from BLM, USGS, FWS, and other partners. Information in the catalog and map viewers are provided via web services or downloaded from the authoritative data sources. Use the search box to the right to find data and resources or use the keyword "SO3336" on the Search All or Browse All pages listed above.



The main content area is split into two panels. The left panel is titled "Map Viewer" and contains a map interface. The map shows the western United States with a purple-shaded region representing the Integrated Rangeland Fire Management Strategy area. Major cities like Vancouver, Seattle, Portland, Sacramento, San Francisco, Fresno, Las Vegas, Los Angeles, Phoenix, Denver, Salt Lake City, Boise, Reno, and Sacramento are labeled. The map includes a scale bar (0 to 300 miles), a coordinate display (51.495 -115.574 Degrees), and a "Launch Full Feature Map" button at the bottom. The right panel is titled "Resources" and contains a list of links for "Secretarial Order 3336" (Downloadable Data, Live Map Services, Documents, Static Maps) and "Conservation & Restoration Strategy" (Downloadable Data, Live Map Services, Documents, Static Maps). It also features a search box with a "Search" button and a "Browse by Category" link. Below the resources is a "Toolbox" section with icons and links for "Sagebrush Assessment & Geospatial Evaluation (SAGE) Data Viewer", "Fire and Invasives Assessment Tool Viewer", and "Sage Grouse Initiative (SGI) Interactive Map".

Geospatial Framework Interface



USGS
Landscape Approach Data Portal
Data, Maps, and Models from BLM's Landscape Approach Initiatives

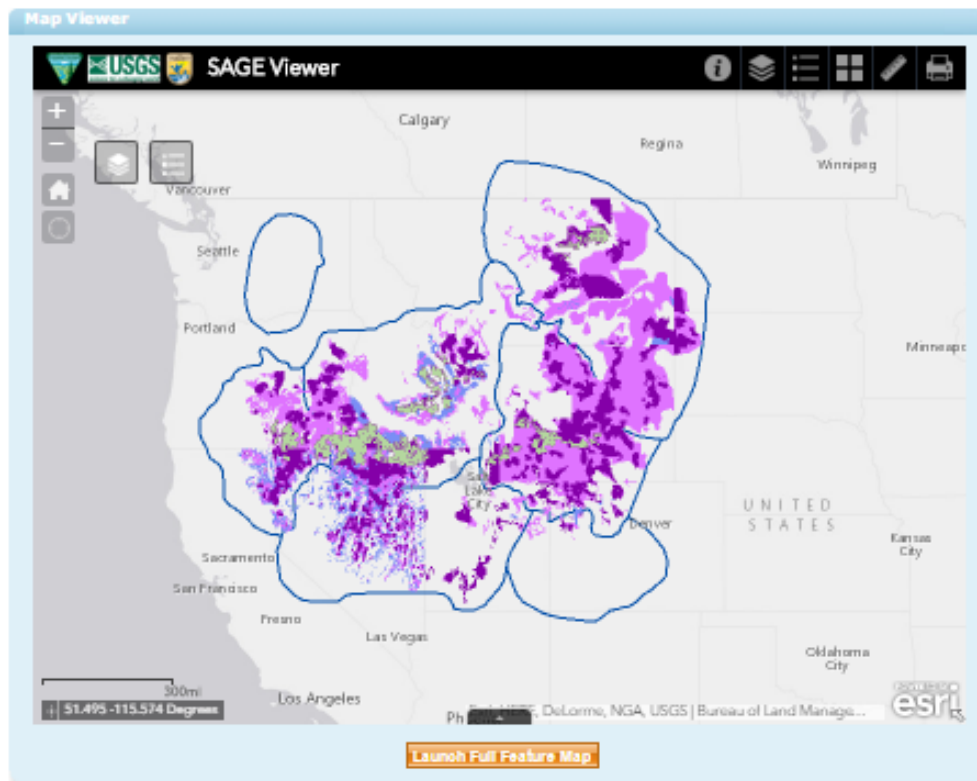
Help About Feedback

Home Search All Browse All AIM FIAT Greater Sage-Grouse REAs Secretarial Order 3336 How To

USGS Integrated Rangeland Fire Management Strategy Geospatial Framework (Secretarial Order 3336)

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Map Viewer

USGS SAGE Viewer

Calgary Regina Winnipeg Vancouver Seattle Portland Sacramento San Francisco Fresno Las Vegas Los Angeles

UNITED STATES

300mi
51.495 -115.574 Degrees

esri

Launch Full Feature Map

Resources



Secretarial Order 3336

- [Downloadable Data](#)
- [Live Map Services](#)
- [Documents](#)
- [Static Maps](#)

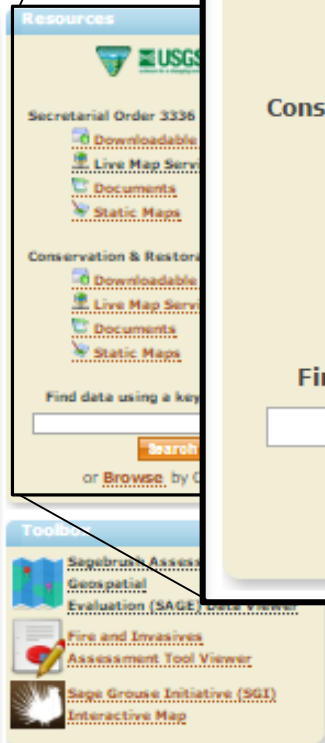
Conservation & Restoration Strategy

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Find data using a keyword search

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or [Browse](#) by Category



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USGS

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Tools

- [Sagebrush Assessment Geospatial Evaluation \(SAGE\) Data Viewer](#)
- [Fire and Invasives Assessment Tool Viewer](#)
- [Sage Grouse Initiative \(SGI\) Interactive Map](#)

Geospatial Framework Interface



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Data, Maps, and Models from BLM's Landscape Approach Initiatives

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Search

Text: [Search](#)

Example: *nwp AND sage grouse*

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- [Annual Herbaceous Percent - Provisional Remote Sensing Shrub/Grass NLCD Products for the Great Basin](#)
- [Bare Ground Percent - Provisional Remote Sensing Shrub/Grass NLCD Products for the Great Basin](#)
- [Big Sagebrush Percent - Provisional Remote Sensing Shrub/Grass NLCD Products for the Great Basin](#)
- [BLM FIAT Assessment Areas 2015 Polygon](#)
- [BLM FIAT Central Oregon Sagebrush Habitat at Risk of Conifer Expansion 2015 Integer Raster](#)
- [BLM FIAT ESR Priority Areas 2015 Polygon](#)
- [BLM FIAT Fire Operations Priority Areas Polygon](#)
- [BLM FIAT Northern Great Basin Sagebrush Habitat at Risk of Conifer Expansion 2015 Integer Raster](#)
- [BLM FIAT Potential Ecosystem Resilience and Resistance in Sagebrush Habitat 2015 Integer Raster](#)
- [BLM FIAT Potential Treatment Areas Polygon](#)

See results through REST API: [GEORSS](#) [ATOM](#) [HTML](#) [FRAGMENT](#) [KML](#) [JSON](#) [CSV](#)

Geospatial Framework Interface



Landscape Approach Data Portal
Data, Maps, and Models from BLM's Landscape Approach Initiatives

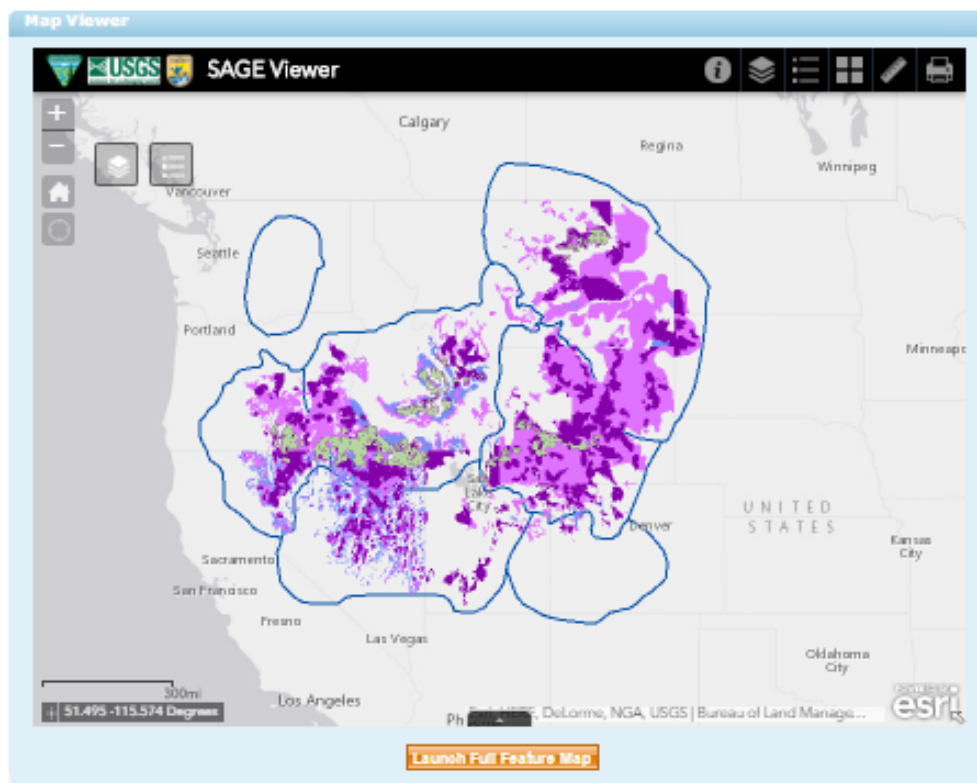
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Integrated Rangeland Fire Management Strategy Geospatial Framework (Secretarial Order 3336)

The **Integrated Rangeland Fire Management Strategy** (the Strategy) sets in motion actions to enhance the protection, conservation, and resiliency of a healthy sagebrush-steppe ecosystem, and to address important public safety, economic, cultural, and social concerns. The Strategy is intended to improve the efficiency and efficacy of actions to better prevent and suppress rangeland fire, and improve efforts to restore fire-impacted landscapes. Identifying geospatially-explicit management strategies will further efforts to conserve important greater sage-grouse habitats by limiting the likelihood of fire and targeting management strategies to improve resilience. Geospatial tools and enhanced data sharing can provide a common framework to support the implementation of the Strategy.

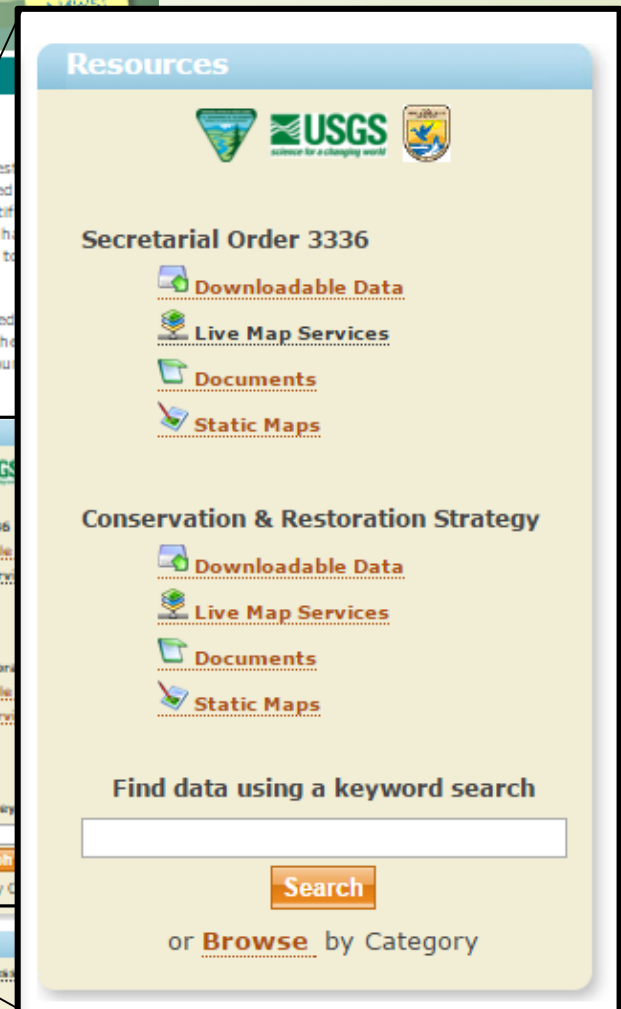
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Map Viewer
SAGE Viewer

Map showing the geospatial framework for the Integrated Rangeland Fire Management Strategy. The map displays the United States with a blue outline of the study area. Major cities labeled include Vancouver, Seattle, Portland, Sacramento, San Francisco, Fresno, Las Vegas, Los Angeles, Phoenix, Denver, Kansas City, Minneapolis, Winnipeg, Regina, and Calgary. The map features a purple and green overlay representing the geospatial framework. A scale bar indicates 300 miles. The map is powered by Esri.

[Launch Full Feature Map](#)



Resources

Secretarial Order 3336

- [Downloadable Data](#)
- [Live Map Services](#)
- [Documents](#)
- [Static Maps](#)

Conservation & Restoration Strategy

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- [Live Map Services](#)
- [Documents](#)
- [Static Maps](#)

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Tools

- [Sagebrush Assessment Geospatial Evaluation \(SAGE\) Data Viewer](#)
- [Fire and Invasives Assessment Tool Viewer](#)
- [Sage Grouse Initiative \(SGI\) Interactive Map](#)

Geospatial Framework Interface



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Example: *nwp AND sage grouse*

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[BLM GRSG Westwide Habitat Disturbance Threat of Oil and Gas Wells 2016 Raster](#)

[Ecoregions of North America](#)

[GeoMAC Downloadable Fire Perimeters](#)

[Greater Sage-Grouse 2015 USFWS Status Review Management Zones](#)

[Greater Sage-Grouse 2015 USFWS Status Review PACs](#)

[GRSG Breeding Habitat Probabilities within R&R Classes Raster](#)

[GRSG Breeding Habitat Probability Raster](#)

A raster dataset representing the probability of the surrounding landscape (6.4km radius) supporting a greater sage-grouse lek. This dataset was made by mosaicking the probability of GRSG habitat layers (citation) and classifying them into unsuitable (0.01...

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[GRSG Relative High and Low Densities within R&R Classes Raster](#)

[GRSG Relative Percent of Population Raster](#)

[Index of Relative Ecosystem Resilience and Resistance across Sage-Grouse Management Zones](#)

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Example: nwp AND sage grouse

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Geospatial Framework Interface



Communities → Science Framework for the ... → GRSG Breeding Habitat Pro...

GRSG Breeding Habitat Probability Raster

Go to - View -

Dates

Publication Date : 2016-07
Time Period : 2016-07

Citation

Department of Ecosystem Science, University of Wyoming, 201607, GRSG Breeding Habitat Probability Raster: .

Summary

A raster dataset representing the probability of the surrounding landscape (8.4km radius) supporting a greater sage-grouse lek. This dataset was made by mosaicking the probability of GRSG habitat layers (citation) and classifying them into unsuitable (0.01-0.25), low (0.25-0.50), moderate (0.50-0.65), and high (0.65-1.0) probabilities of the landscape supporting a lek.

Contacts

Point of Contact : United States Department of Agriculture (USDA), United States Forest Service (USFS)
Process Contact : Jacob D. Hennig
Originator : Department of Ecosystem Science, University of Wyoming
Metadata Contact : Jacob D. Hennig
Distributor : United States Geological Survey

Attached Files

Click on title to download individual files attached to this item or [download all files listed below as a compressed file.](#)

Breeding_Habitat_Probability.tif.xml <i>Original Metadata</i>	View	12.67 KB
Breeding_Habitat_Probability.zip		6.71 MB

Map »



Spatial Services

ArcGIS Mapping Service : <https://www.sciencebase.gov/arcg>

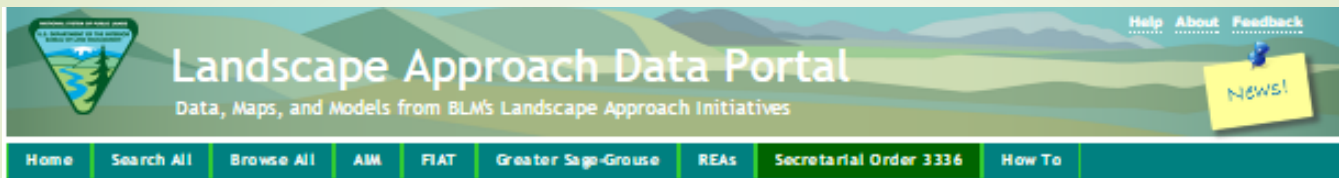
WMS Service : <https://www.sciencebase.gov/arcg>

ScienceBase WMS : <https://www.sciencebase.gov/cata>

Tags

Categories : Data
Theme : CRS, Geospatial, Management,

Geospatial Framework Interface



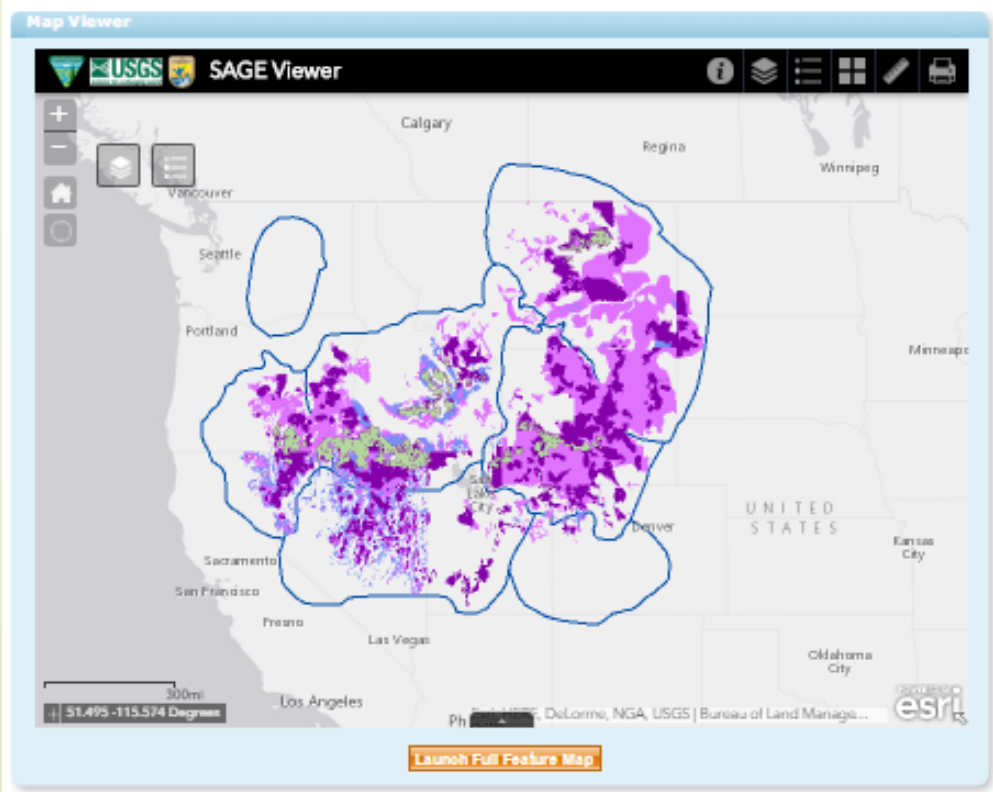
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Data, Maps, and Models from BLM's Landscape Approach Initiatives

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Integrated Rangeland Fire Management Strategy Geospatial Framework (Secretarial Order 3336)


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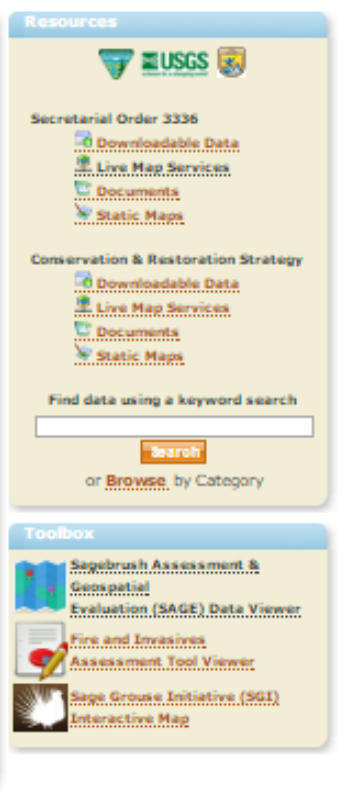


Map Viewer



  **SAGE Viewer**

Map showing the western United States with fire management strategy overlays. Major cities labeled include Vancouver, Seattle, Portland, Sacramento, San Francisco, Fresno, Las Vegas, Los Angeles, Denver, Kansas City, Oklahoma City, Minneapolis, Regina, Winnipeg, and Calgary. A scale bar indicates 300 miles. Coordinates: 51.495 -115.574 Degrees. Attribution: Ph [unclear], Delorme, NGA, USGS | Bureau of Land Management. 

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Resources

Secretarial Order 3336

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- [Live Map Services](#)
- [Documents](#)
- [Static Maps](#)

Conservation & Restoration Strategy




- [Downloadable Data](#)
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Find data using a keyword search

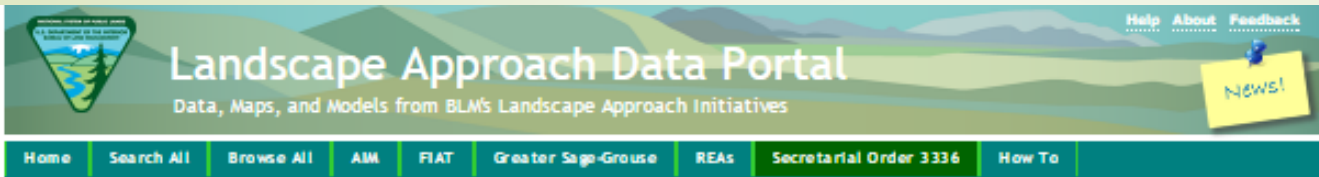
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Toolbox

-  [Sagebrush Assessment & Geospatial Evaluation \(SAGE\) Data Viewer](#)
-  [Fire and Invasives Assessment Tool Viewer](#)
-  [Sage Grouse Initiative \(SGI\) Interactive Map](#)

Geospatial Framework Interface



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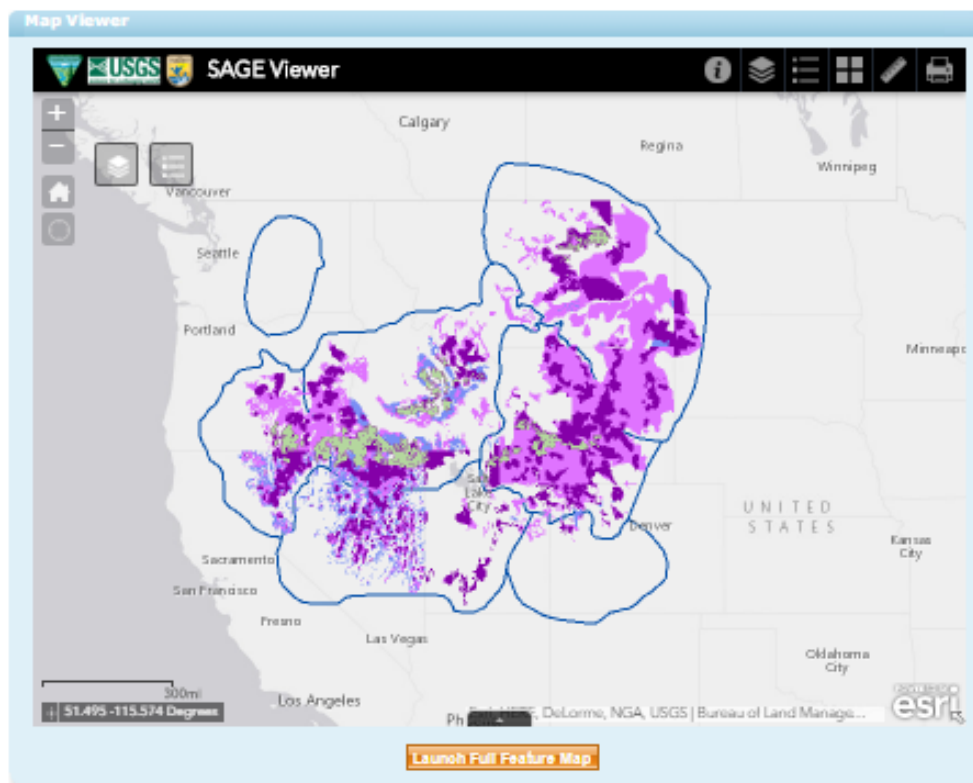
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Integrated Rangeland Fire Management Strategy Geospatial Framework [\(Secretarial Order 3336\)](#)

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Map Viewer

 **SAGE Viewer**

Calgary Regina Winnipeg

Vancouver Seattle Portland Sacramento San Francisco Fresno Las Vegas Los Angeles

MINNEAPOLIS DENVER KANSAS CITY OKLAHOMA CITY

UNITED STATES


300mi
51.495 -115.574 Degrees

esri

Launch Full Feature Map



Toolbox

-  [Sagebrush Assessment & Geospatial Evaluation \(SAGE\) Data Viewer](#)
-  [Fire and Invasives Assessment Tool Viewer](#)
-  [Sage Grouse Initiative \(SGI\) Interactive Map](#)

Resources



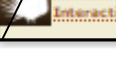
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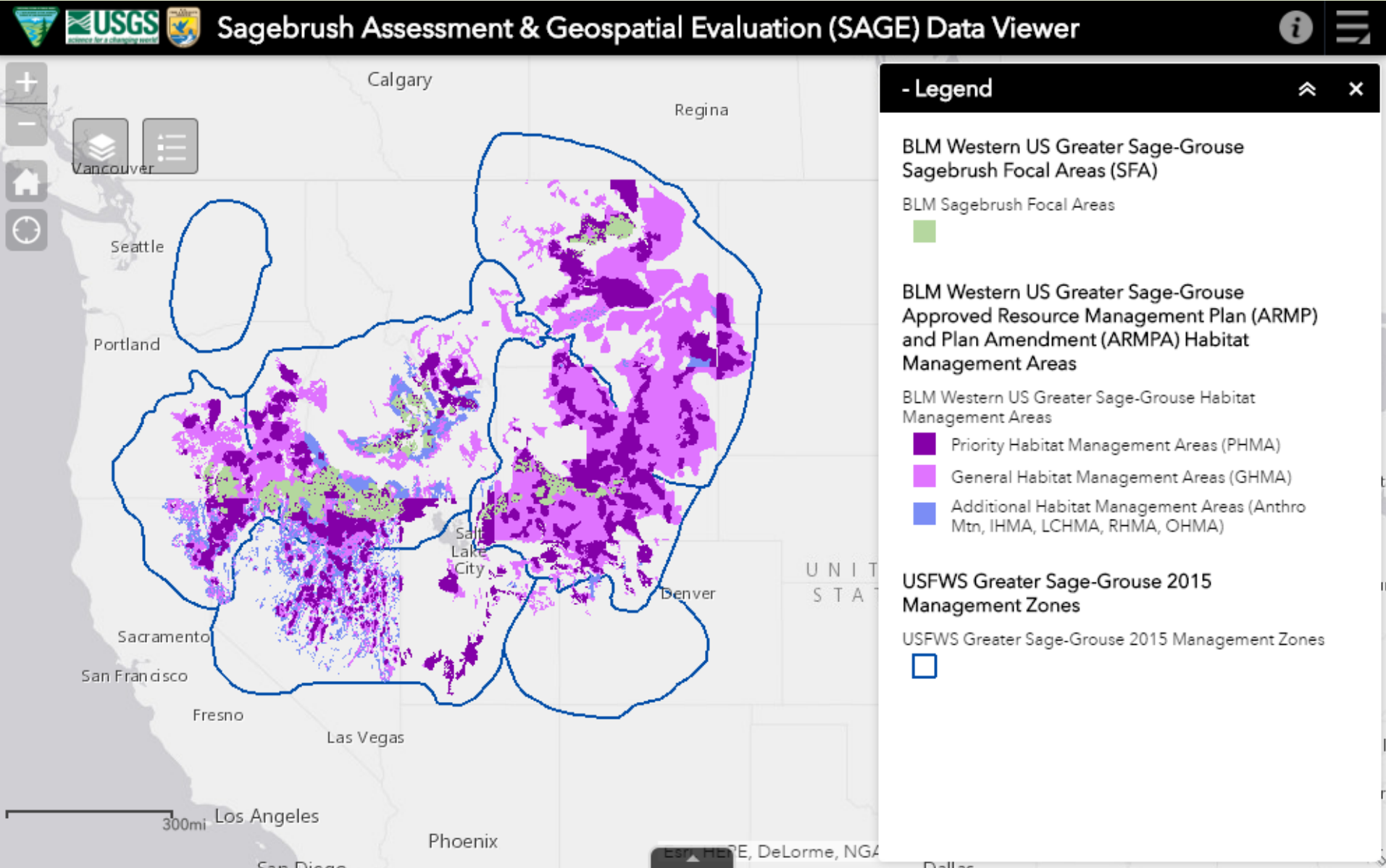
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Toolbox

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-  [Fire and Invasives Assessment Tool Viewer](#)
-  [Sage Grouse Initiative \(SGI\) Interactive Map](#)

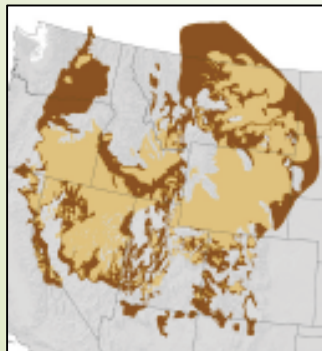
Geospatial Framework Interface



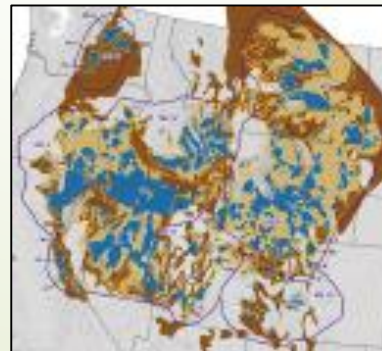
Toolbox

- Visualization
- Decision Support
 - Support for large-scale assessment and prioritization
 - Assist with regional and project level planning

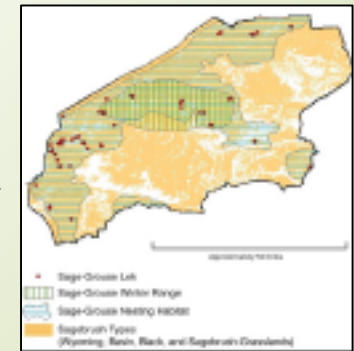
Sagebrush biome



Sage-Grouse MZs and ecoregions



Local and site planning areas



Example Tool

Bureau of Land Management's Rapid Ecoregional Assessment for the Wyoming Basin Log out

Home REA Team Documents Project Screening Tool GIS Data Web Links Feedback

Full Extent Prev Extent Next Extent Draw Clear Submit Import Shapefile Download Results as PDF Download Results as CSV

Wyoming Basin REA Primary Map Layers

Project Screening Tool Objectives

How to use the Project Screening Tool

About the Analysis and Results

- Collapse Layers
- Boundaries**
 - Counties
 - States
 - Wyoming Basin Rapid Ecoregional Assessment
- Terrestrial Ecological Communities
- Plants
- Wildlife habitat
- Ownership

Adjust Opacity Low High

- Collapse Layers
- Development Footprint**
- Terrestrial Development Index
 - 0 - 1%
 - 1 - 3%
 - 3 - 5%
 - 5 - 100%
- Fire Occurrence from 1980 - 2012
- Conservation Potential

Adjust Opacity Low High

- Collapse Layers
- National Roads Map**
 - World Transportation

Adjust Opacity

Double-click to complete

Wamsutter

Sweetwater

Example Tool

Bureau of Land Management's Rapid Ecoregional Assessment for the Wyoming Basin Log out

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Full Extent Prev Extent Next Extent Draw Clear Submit Import Shapefile Download Results as PDF Download Results as CSV

Wyoming Basin REA Primary Map Layers

Project Screening Tool Objectives
How to use the Project Screening Tool
About the Analysis and Results

- Collapse Layers
- Boundaries**
 - Counties
 - States
 - Wyoming Basin Rapid Ecoregional Assessment
- Terrestrial Ecological Communities**
 - Sagebrush steppe
 - Desert shrublands
 - Foothill shrublands and woodlands
 - Montane/subalpine forest and alpine zones
 - Other
- Plants**
- Wildlife habitat**
- Ownership

Adjust Opacity Low High

- Collapse Layers
- Development Footprint**
- Terrestrial Development Index**
 - 0 - 1%
 - 1 - 3%
 - 3 - 5%
 - 5 - 100%
- Fire Occurrence from 1980 - 2012
- Conservation Potential**

Adjust Opacity Low High

Analysis Results

Terrestrial Development Index | Land Ownership/Jurisdiction | Terrestrial Ecological Communities | Plants and Wildlife | Fire Occurrence | Conservation Potential

Terrestrial Dev Index	Submitted Project (4,551 acres)		Wyoming Basin Ecoregion (44,083,876 acres)	
	Percent	Area (ac)	Percent	Area (ac)
0 - 1%	14	638	29	12,643,674
1 - 3%	33	1,490	39	17,329,883
3 - 5%	39	1,772	10	4,278,923
5 - 100%	14	650	22	9,825,969

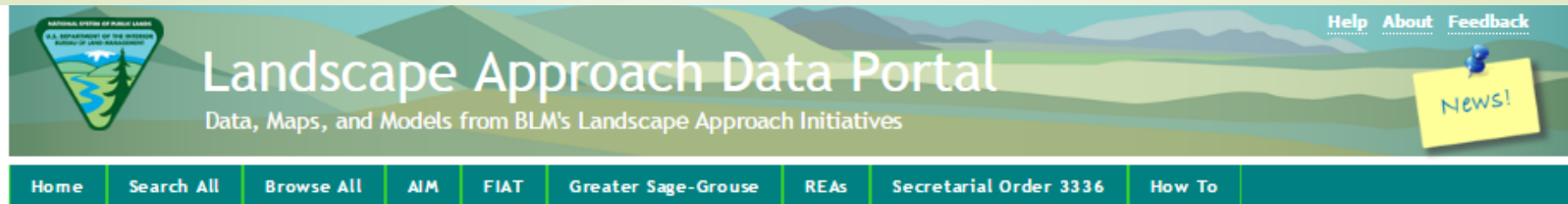
Terrestrial Development Index scores are based on the total percent area of surface disturbance within a 16 km² moving window (3954 ac).

Hover mouse over a bar in the graph to display additional details.

Percent of project area

Terrestrial Development Index

Geospatial Portal and Decision Tools



NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Landscape Approach Data Portal

Data, Maps, and Models from BLM's Landscape Approach Initiatives

Help About Feedback

NEWS!

Home Search All Browse All AIM FIAT Greater Sage-Grouse REAs Secretarial Order 3336 How To

Home

The **BLM's Landscape Approach** Data Portal is a one-stop source for **geospatial data, maps, models and reports** produced by BLM's landscape initiatives including the:

- Assessment, Inventory & Monitoring (AIM) strategy
- Fire & Invasives Assessment (FIAT) program
- Greater Sage-Grouse (GRSG)
- Rapid Ecoregional Assessments (REAs)
- Secretarial Order 3336, Integrated Rangeland Fire Management Strategy (SO3336).

To learn more about each initiative and the products that are available for them, click on the [images to the right](#) or the [tabs above](#). You can find products from all of these initiatives by using the [Search or Browse tabs](#) above.

On the Search page, enter any keyword(s) in the Text box or search by:

- Initiative — such as *AIM, FIAT, REA, or sage-grouse*
- Subject — such as *sage-grouse, soils, intactness*
- Place — such as *CO, Northern Great Basin*.

You can conduct [advanced searches](#) on the Search page such as filtering by content type (e.g., data, map, model) or geographic extent. You can even [search other data portals](#) simultaneously, including USGS Science Base, Data.gov, and ArcGIS Online. Click on this [How To...](#) link for instructions.

On the Browse page, simply click each header to expand the various categories. For example, you can browse by Content Type (data, maps, models) or a specific REA (e.g., Colorado Plateau REA).



Assessment, Inventory & Monitoring (AIM)

Fire & Invasives Assessment Tool (FIAT)

Greater Sage-Grouse (GRSG)

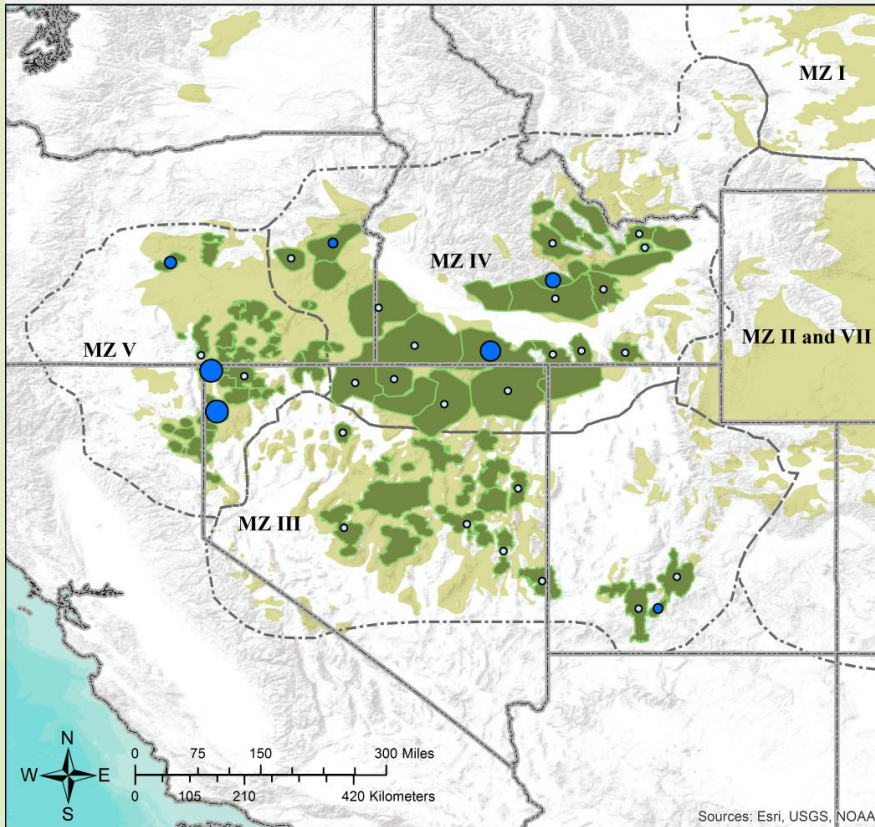
Rapid Ecoregional Assessments (REAs)

Secretarial Order 3336 (SO3336)

<http://www.landscape.blm.gov/geoportal/>

Implementation of Approach – BLM Identified Priority Habitat Areas & Funding Allocation

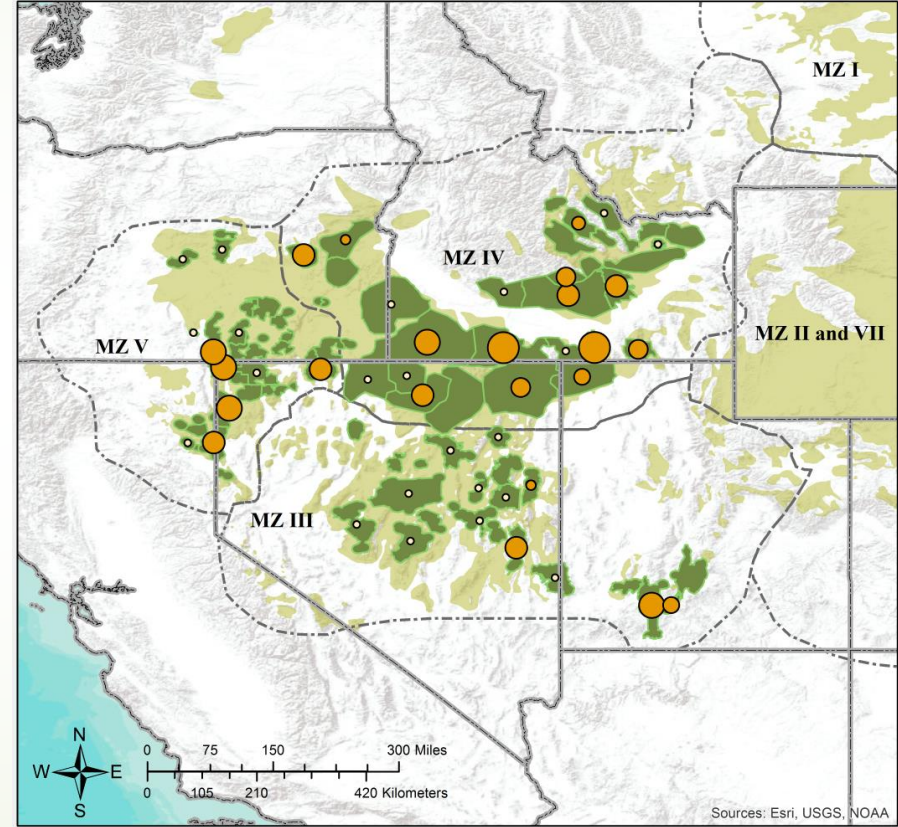
FY13 Accomplished



Explanation

FY13 DOI Funding (\$)	<ul style="list-style-type: none"> ○ 0 ● 1 - 5,000 ● 5,001 - 10,000 ● 10,000 - 50,000 ● 50,001 - 100,000 ● 100,001 - 300,000 ● 300,001 - 500,000 	<ul style="list-style-type: none"> ■ Project Planning Priority Areas ■ Greater Sage-Grouse Range - - - Management Zones
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FY16 Planned



Explanation

FY16 Planned DOI Funding (\$)	<ul style="list-style-type: none"> ○ 0 ● 1 - 5,000 ● 5,001 - 10,000 ● 10,001 - 50,000 ● 50,001 - 100,000 ● 100,001 - 300,000 ● 300,001 - 500,000 ● 500,001 - 700,000 ● 700,001 - 900,000 	<ul style="list-style-type: none"> ■ Project Planning Priority Areas ■ Greater Sage-Grouse Range - - - Management Zones
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Source: NFPORS



Implementation of Approach – FS Fire and Invasive Assessments in R1/R2/R4

Prioritization uses a risk analysis and a scoring process

- Uses a risk based approach – includes fire risk models and invasive annual grass models in addition to R&R, sagebrush cover, and conifer cover
- Includes all sage-grouse habit regardless of designation
- Conducted on individual Forest basis

Science Framework Timeline

Timeline	Key Dates
Science Framework Version I and provisional data layers available http://www.treesearch.fs.fed.us/pubs/52275	7/22
Science Data available through Geospatial Framework + Portal	7/22
Eastern Range GTR published	10/30
WAFWA/BLM Conservation and Restoration Workshop	Nov 1-3
Science Framework GTR, in press	12/16

Science Framework Team

Part 1 – Science Approach and Applications (Jeanne Chambers, Lead)

Writing Team	Reviews
<p>Jeanne C. Chambers, Jeffrey L. Beck, Steve Campbell, John Carlson, Thomas J. Christiansen, Karen J. Clause, Michele R. Crist, Jonathan B. Dinkins, Kevin E. Doherty, Shawn Espinosa, Kathleen A. Griffin, Steven E. Hanser, Douglas W. Havlina, Kenneth F. Henke, Jacob D. Hennig, Laurie L. Kurth, Jeremy D. Maestas, Mary Manning, Kenneth E. Mayer, Brian A. Meador, Clinton McCarthy, Mike Pellant, Marco A. Perea, Karen L. Prentice, David A. Pyke, Lief A. Wiechman, and Amarina Wuenschel</p>	<p>Mike Wisdom, Peter Weisberg and about 60 science and management interagency reviewers</p>

Science Framework Team

Part 2 - Management Sections (Karen Prentice, Lead)

	Writing Team Leads
Climate Change	Jeanne Chambers, Louisa Evers, and Linda Joyce
Fire	Michele Crist and Doug Havlina
Invasives	Lindy Garner, Ken Mayer, and Mike Ielmini
Seed Strategy	Fred Edwards, Francis Kilkenny, and Sarah Kulpa
Monitoring	Dave Pyke and Lief Weichman
Mitigation	Leigh Espy

Science Framework - Discussion



A Science Framework for Assessing Threats to Sagebrush Ecosystems and Greater Sage-grouse and Prioritizing Conservation and Restoration Actions

Jeanne Chambers, jchambers@fs.fed.us

Steve Hanser, shanser@usgs.gov

A recording of today's webinar and slides from the presentation will be available at www.GreatBasinLCC.org.

For more information on the Great Basin LCC contact: Rick Kearney, Coordinator, rkearney@blm.gov, (775) 861-6556.

Let us know what you thought of today's webinar!

Please take our two minute survey when you log off.