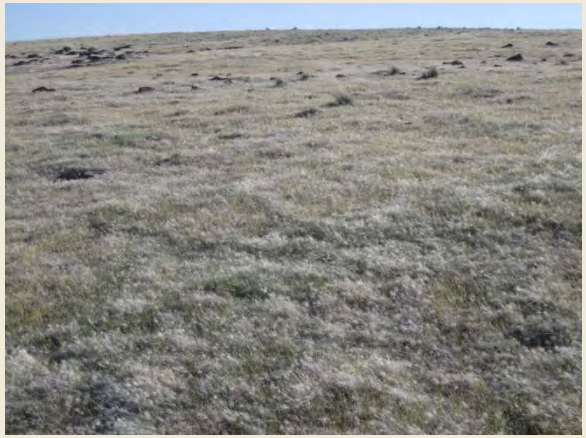
Greater Sage-Grouse Wildfire, Invasive Annual Grasses & Conifer Expansion Assessment : The FIAT process



Doug Havlina - BLM Fire Ecologist, FIAT Coordinator

Sandy Gregory – NV BLM Fuels Lead, S Great Basin FIAT Team Lead

Fire and Invasives Assessment Team (FIAT)

Purpose -

Identify priority habitat areas and management strategies to reduce threats to Greater Sage-Grouse resulting from invasive annual grasses, wildfires, and conifer expansion

- "quantified descriptions of future conservation actions to inform the sage-grouse listing decision" (WO IM-2014-134)

Focus -

Western Association of Fish and Wildlife Management Agencies' (WAFWA) Management Zones III, IV, and V

Collaborative Approach

Development Team

Mike Pellant* (lead)
Jeanne Chambers*
Chad Boyd*
Doug Havlina
Todd Hopkins
Clint McCarthy
Steve Knick
Mike Gregg
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Review Team

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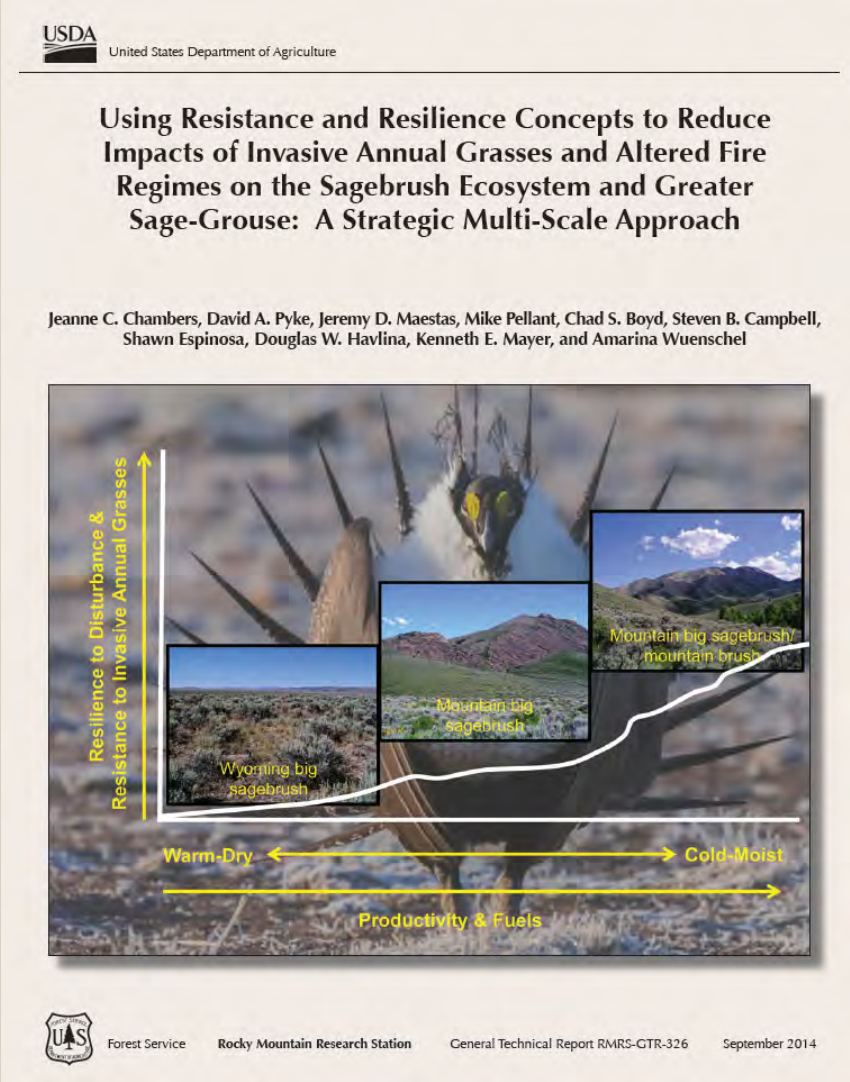
Glen Stein
Mike Ielimi
Krista Gollnick Waid
Chuck Mark
Peggy Olwell
Don Kemner

Scientific Basis


USDA United States Department of Agriculture

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

- Adopted strategic, multi-scale approach developed by WAFWA Fire and Invasives working group
- Several WAFWA Team members participated in FIAT Process development

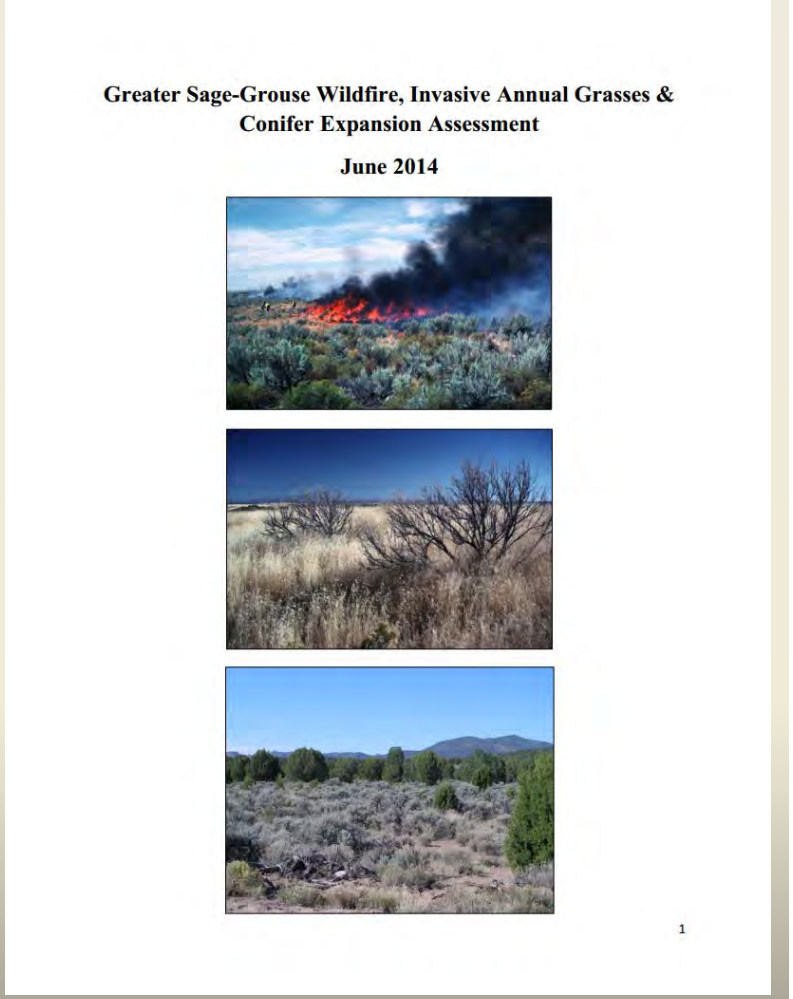
http://www.treesearch.fs.fed.us/pubs/46329

Assessment Process

Step 1 (Regional) -

- Prioritize focal areas for management
  - Identify important sage-grouse occupied habitats
  - Assess resilience to disturbance and resistance to invasive annual grasses and wildfire
  - Assess conifer expansion areas

❖ Identify geospatially explicit management strategies to conserve sage-grouse habitats



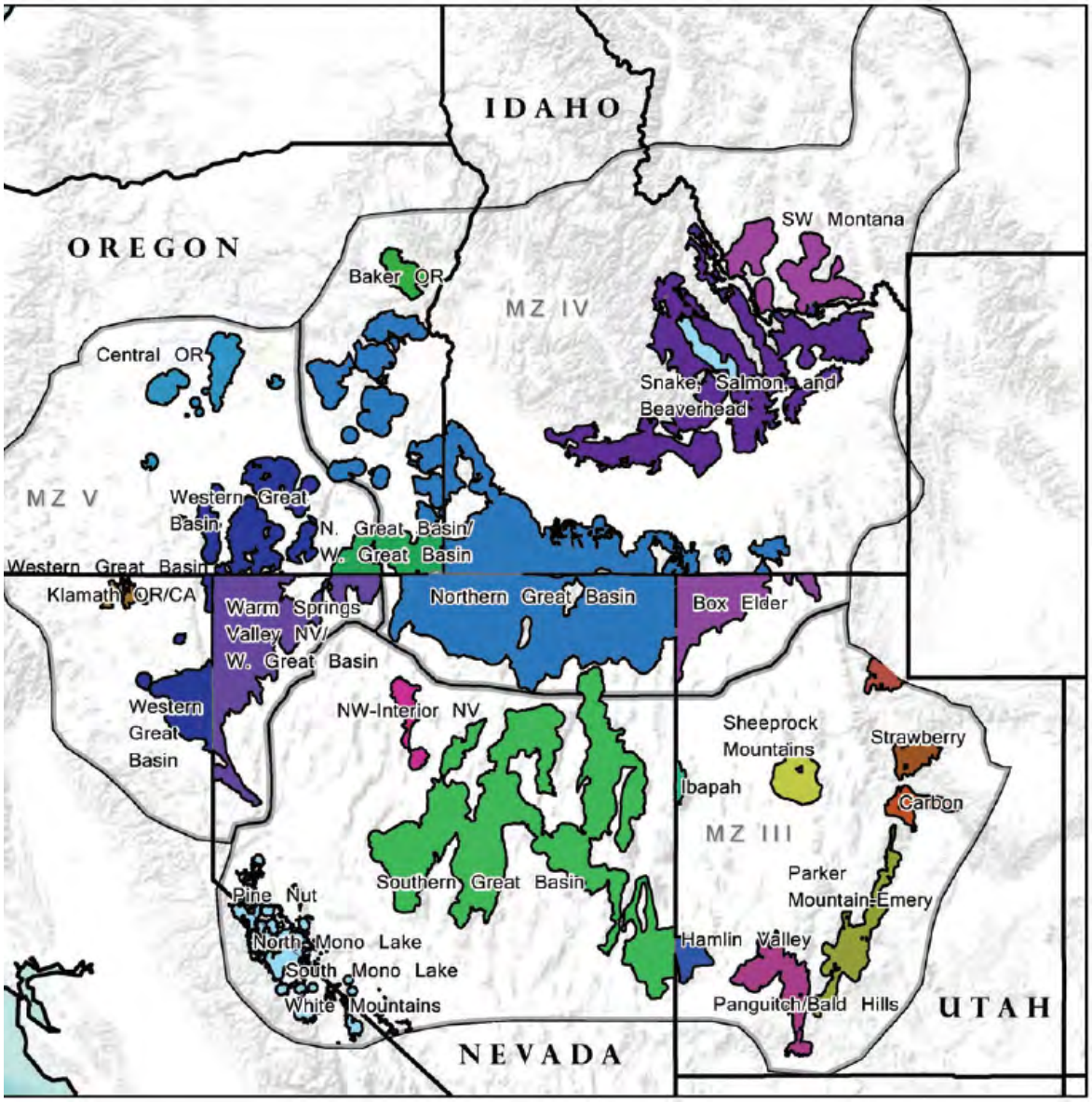
Greater Sage-Grouse Wildfire, Invasive Annual Grasses & Conifer Expansion Assessment

June 2014

1

❖ March 2013 - August 2014

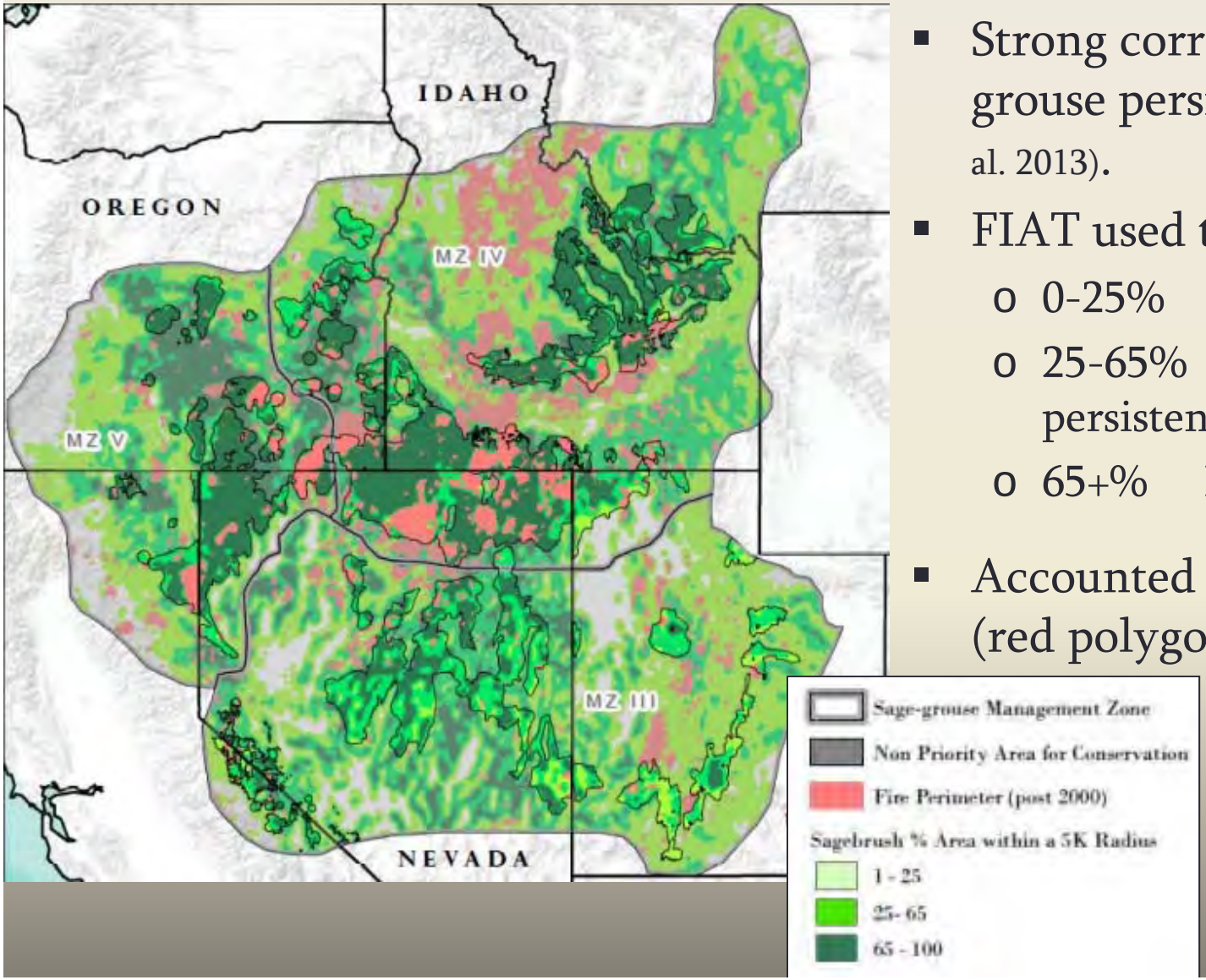
F&WS "Priority Areas for Conservation" (PACs) First Filter for Prioritizing Management Activities



Conservation Objectives Team Report (2013)

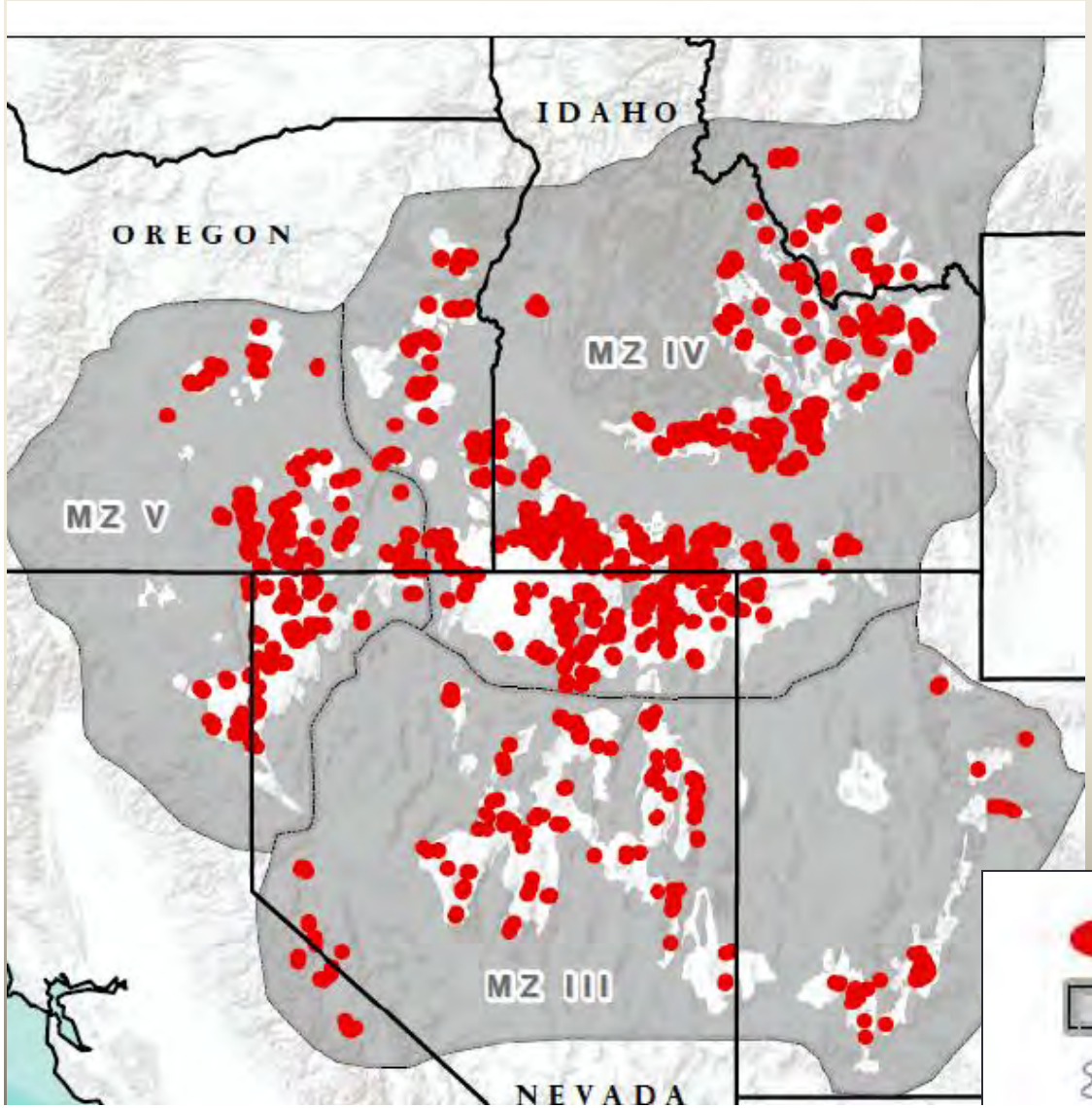
- Identified key areas for sage-grouse conservation based on –
  - Habitat data
  - Population data

Sagebrush Landscape Cover - Indicator of Sage-Grouse Habitat

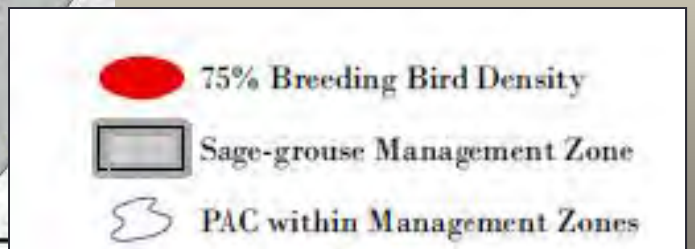


- Strong correlation to sage-grouse persistence (e.g. Knick et al. 2013).
- FIAT used three classes -
  - 0-25% Minimal persistence
  - 25-65% Intermediate persistence
  - 65+% High persistence
- Accounted for recent wildfires (red polygons)

Sage-grouse Breeding Bird Densities – Population Viability



- Best region-wide data on sage-grouse population abundance
- FIAT used areas supporting 75% of breeding bird populations in a 4-5 mile radius around active leks (Doherty et al. 2010)
- Caveat: Does not capture brood rearing or winter habitat



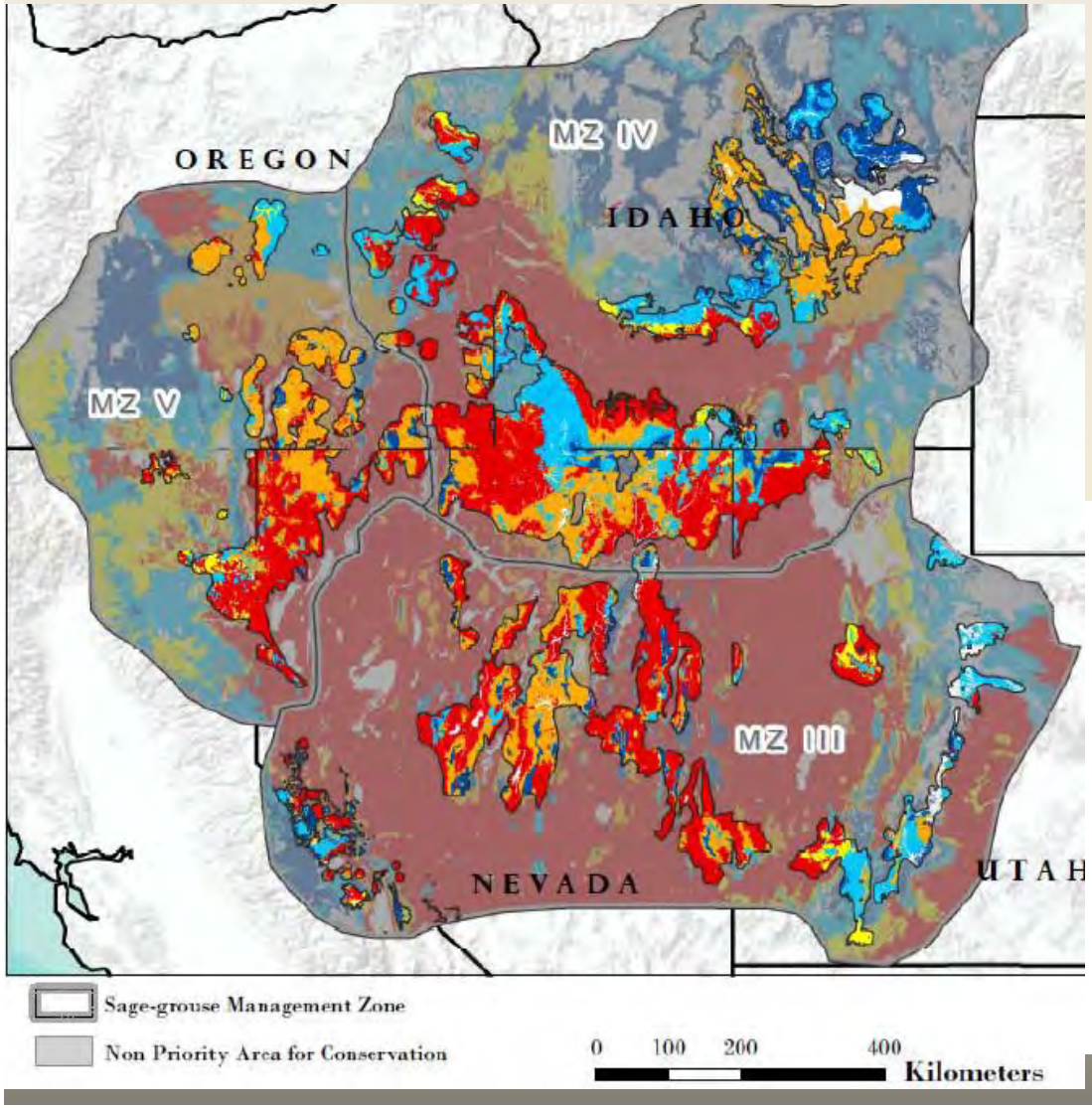
Key Threats to Sage-grouse Addressed by FIAT

Wildfires

Invasive Annual Grasses

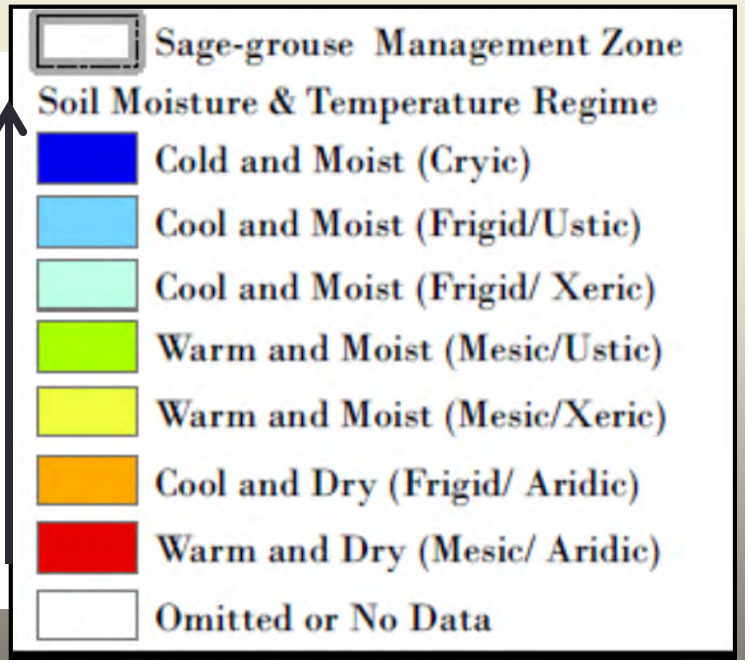
Conifer Expansion

Soil Temperature & Moisture Regimes = Indicator of Resilience and Resistance

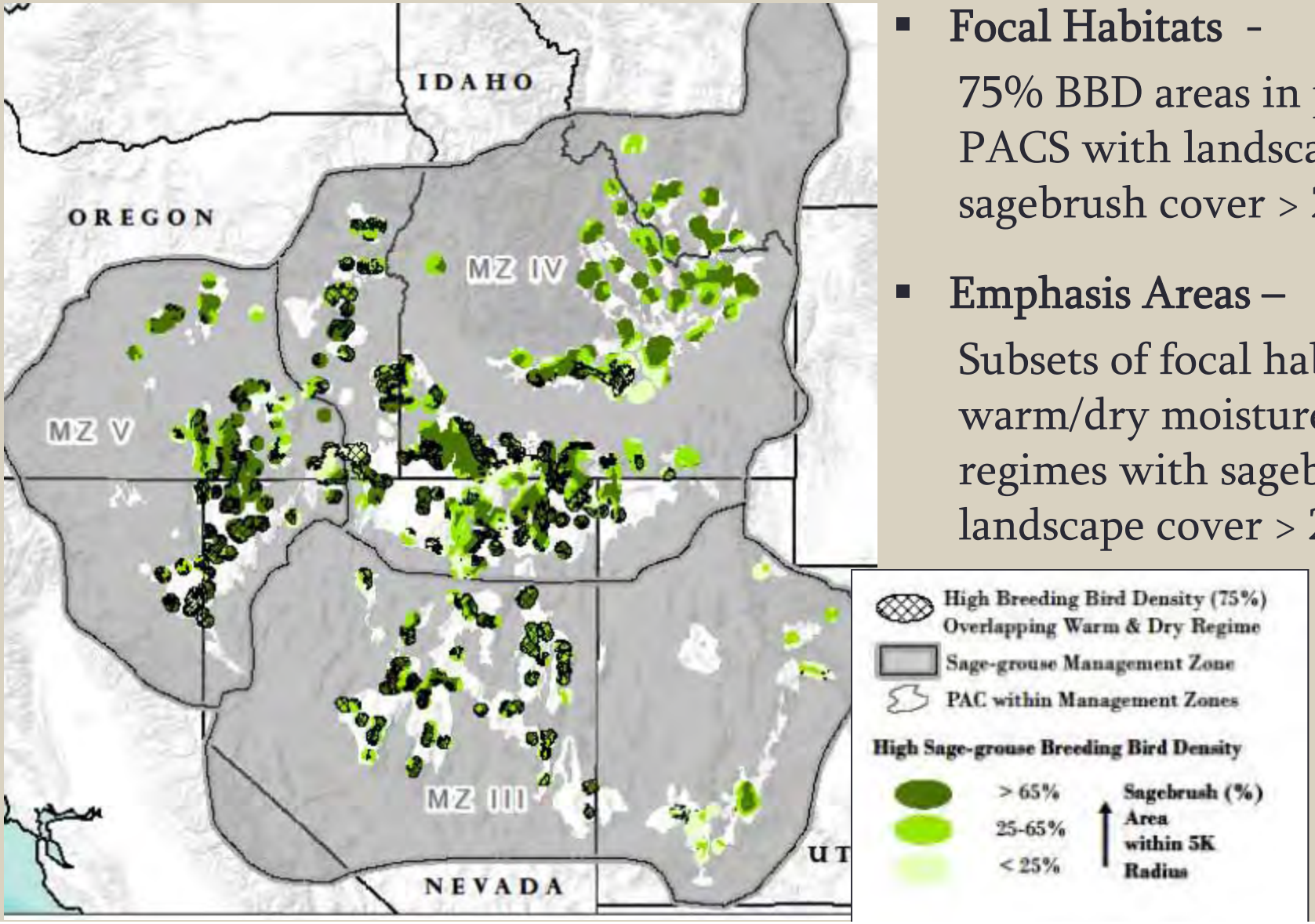


- Soil temperature/moisture regimes strongly associated with resilience and resistance (Chambers et al. 2014)
- Used by FIAT to indicate wildfire and invasive annual grass threat

Resistance & Resilience



Wildfire and Invasive Annual Grass Threat



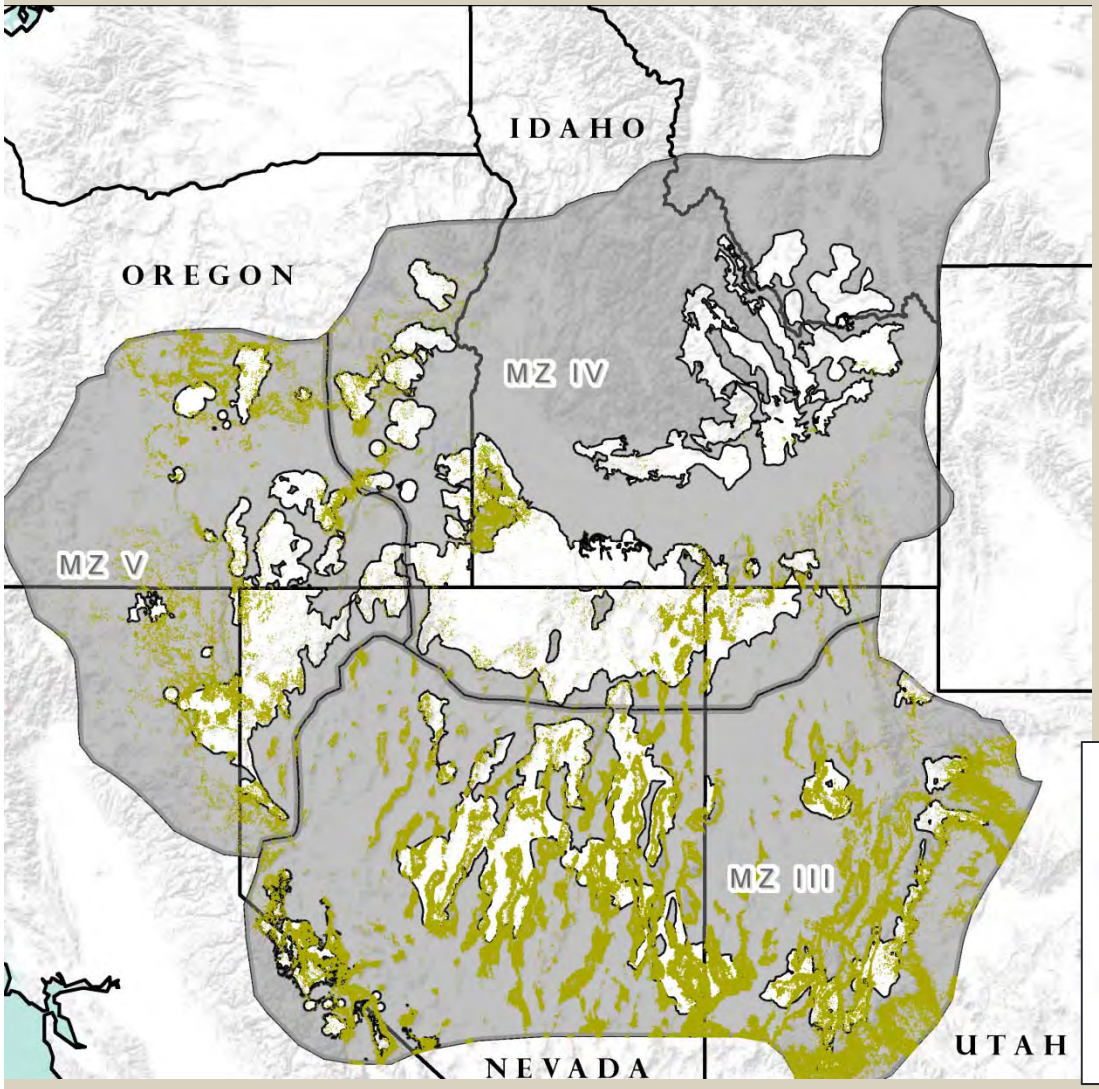
- **Focal Habitats** -

  75% BBD areas in priority PACS with landscape sagebrush cover > 25%

- **Emphasis Areas –**

  Subsets of focal habitats in warm/dry moisture regimes with sagebrush landscape cover > 25%

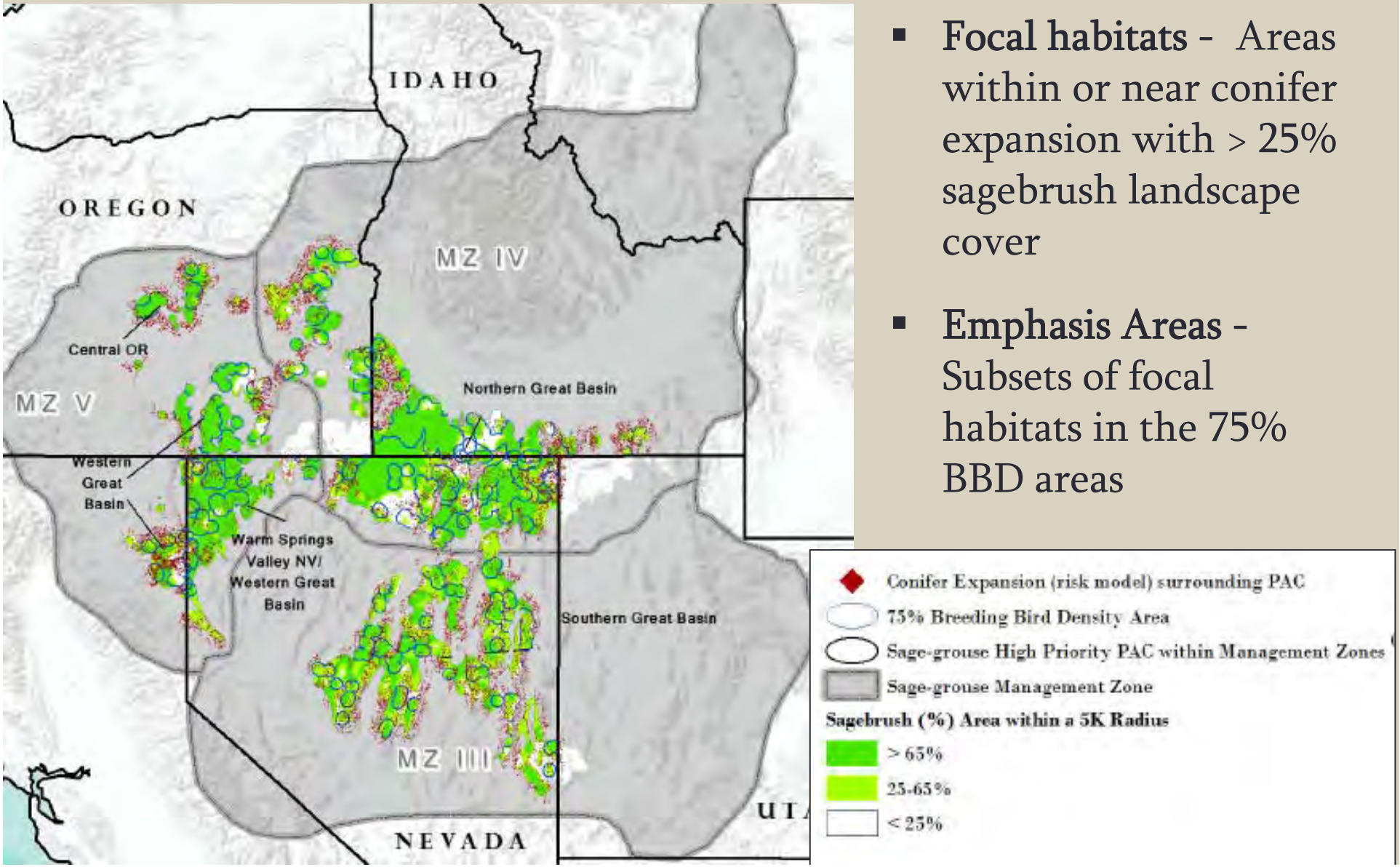
Conifer Expansion Model (Manier et al. 2013) – Conifer Expansion Threat



- Conifer expansion data used by FIAT to quantify conifer expansion threat

Sage-grouse Management Zone
Priority Areas for Conservation (PACs)
Area outside of PACs
Pinyon Juniper Woodland

Wildfire and Conifer Expansion Threat



- **Focal habitats** - Areas within or near conifer expansion with > 25% sagebrush landscape cover
- **Emphasis Areas** - Subsets of focal habitats in the 75% BBD areas

Wildfire and Invasive Annual Grass PACs

Highest Area of 75% BBD &
Area of 75% BBD within the Warm/Dry Soil T/M Regime

Sage-grouse Management Zone	Sage-grouse Priority Area for Conservation (PAC) Name	Total PAC Acres	Breeding Bird Density (75%) Acres	Percent of Breeding Bird Density (75%) Area within PAC	Warm and Dry Soil Moisture & Temperature Regime within Breeding Bird Density (75%) Acres*		
					0-25% Sagebrush Landscape Cover	25%-65% Sagebrush Landscape Cover	65%+ Sagebrush Landscape Cover
4	Northern Great Basin	13045515	7383442	57%	179551 (2%)	674554 (9%)	1745163 (24%)
3	Southern Great Basin	9461355	3146056	33%	42596 (1%)	792780 (25%)	1062091 (34%)
4	Snake, Salmon, and Beaverhead	5477014	2823205	52%	68107 (2%)	89146 (3%)	95970 (3%)
5	Western Great Basin	3177253	2084626	66%	149399 (7%)	140141 (7%)	202767 (10%)
5	Warm Springs Valley NV/Western Great Basin	3520937	1558166	44%	31458 (2%)	207365 (13%)	741353 (48%)
4	SW Montana	1369076	659475	48%	0 (0%)	0 (0%)	0 (0%)
4	Northern Great Basin/Western Great Basin	1065124	624581	59%	114222 (18%)	85258 (14%)	116513 (19%)
5	Central OR	813699	451755	56%	0 (0%)	6211 (1%)	16463 (4%)
3	Panguitch/Bald Hills	1135785	352258	31%	6883 (2%)	5821 (2%)	0 (0%)
3	Parker Mountain-Emery	1122491	308845	28%	0 (0%)	127 (0%)	0 (0%)
4	Box Elder	1519454	292658	19%	22 (0%)	43325 (15%)	23913 (8%)
4	Baker OR	336540	184813	55%	0 (0%)	46459 (25%)	36214 (20%)
3	NW-Interior NV	371557	108256	29%	576 (1%)	17117 (16%)	25173 (23%)
3	Carbon	355723	97734	27%	255 (0%)	180 (0%)	0 (0%)
3	Strawberry	323219	52635	16%	0 (0%)	0 (0%)	0 (0%)
3	Rich-Morgan-Summit	217033	37005	17%	0 (0%)	0 (0%)	0 (0%)
3	Hamlin Valley	341270	3244	1%	0 (0%)	139 (4%)	3105 (96%)
3	Ibapah	98574	0	0%	0 (NA)	0 (NA)	0 (NA)
3	Sheeprock Mountains	611374	0	0%	0 (NA)	0 (NA)	0 (NA)
5	Klamath OR/CA	162667	0	0%	0 (NA)	0 (NA)	0 (NA)

* Numbers in parenthesis indicate the percent of acres relative to total acres of breeding bird density (75%)

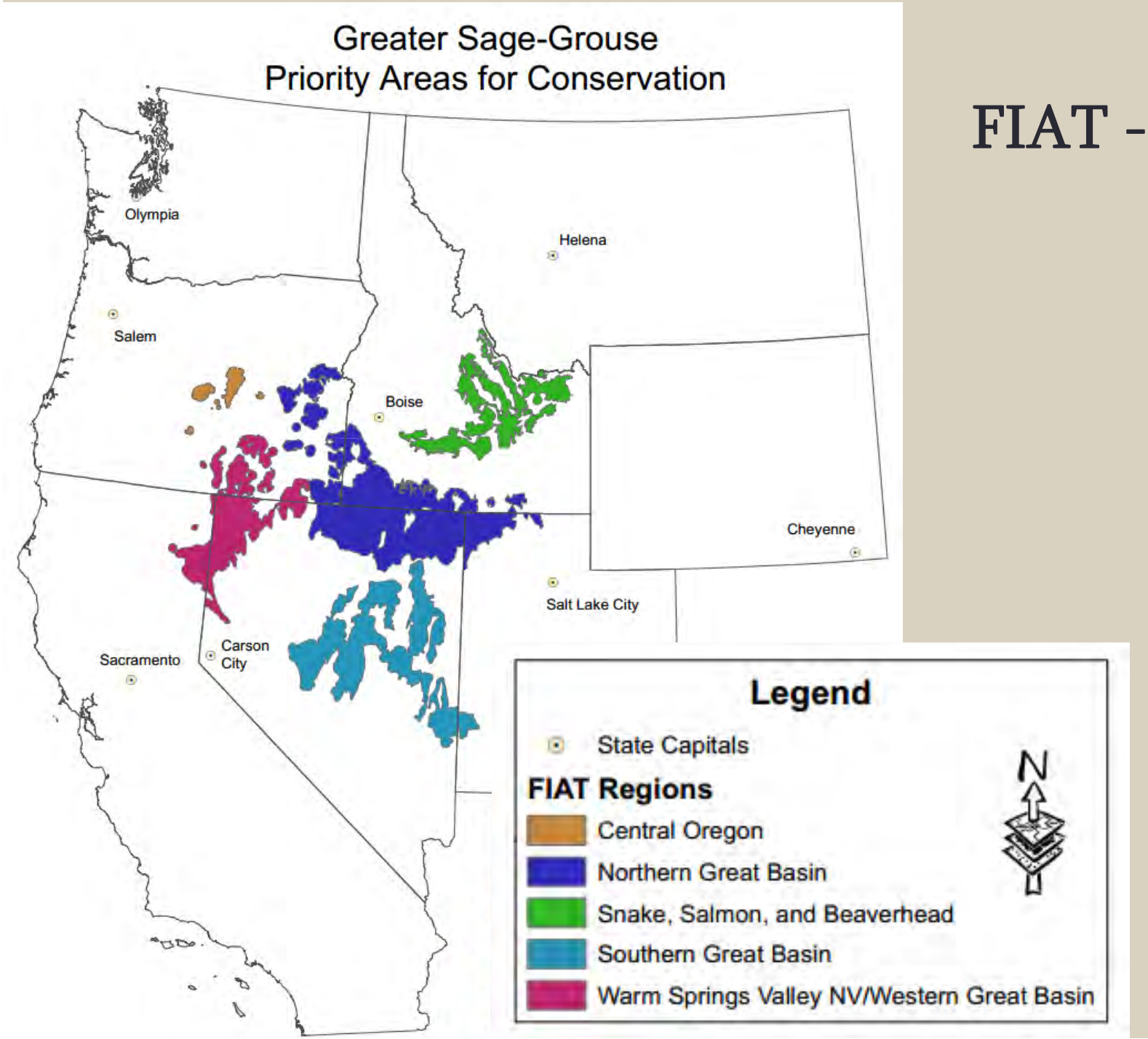
Conifer Expansion PACs

Highest Areas of 75% BBD acres & Estimated Conifer Expansion in Sagebrush Landscape Cover Classes > 25%

Sage-grouse Management Zone	Sage-grouse Priority Area for Conservation (PAC) Name	Total PAC Acres	Breeding Bird Density (75%) Acres	Percent Breeding Bird Density (75%) Acres	Conifer Expansion (Modeled) Acres within Breeding Bird Density (75%) Areas*		
					0-25% Sagebrush Landscape Cover	25%-65% Sagebrush Landscape Cover	65%+ Sagebrush Landscape Cover
4	Northern Great Basin	13045515	7383442	57%	95714 (1%)	247250 (3%)	272079 (4%)
3	Southern Great Basin	9461355	3146056	33%	23982 (1%)	229389 (7%)	92756 (3%)
4	~~Snake, Salmon, and Beaverhead~~	5477014	2823205	52%	970 (0%)	18367 (1%)	92251 (3%)
5	Western Great Basin	3177253	2084626	66%	57918 (3%)	106130 (5%)	67858 (3%)
5	Warm Springs Valley NV/Western Great Basin	3520937	1558166	44%	9984 (1%)	46846 (3%)	104168 (7%)
4	SW Montana	1369076	659475	48%	90 (0%)	8182 (1%)	21224 (3%)
4	Northern Great Basin/Western Great Basin	1065124	624581	59%	9436 (2%)	1869 (0%)	3587 (1%)
5	Central OR	813699	451755	56%	339 (0%)	27260 (6%)	31765 (7%)
3	Panguitch/Bald Hills	1135785	352258	31%	28515 (8%)	22118 (6%)	0 (0%)
3	Parker Mountain-Emery	1122491	308845	28%	6967 (2%)	15052 (5%)	5980 (2%)
4	Box Elder	1519454	292658	19%	2415 (1%)	22184 (8%)	20316 (7%)
4	Baker OR	336540	184813	55%	1 (0%)	7484 (4%)	195 (0%)
3	NW-Interior NV	371557	108256	29%	4320 (4%)	5718 (5%)	653 (1%)
3	Carbon	355723	97734	27%	3364 (3%)	15832 (16%)	0 (0%)
3	Strawberry	323219	52635	16%	236 (0%)	1007 (2%)	0 (0%)
3	Rich-Morgan-Summit	217033	37005	17%	3913 (11%)	2628 (7%)	0 (0%)
3	Hamlin Valley	341270	3244	1%	0 (0%)	16 (0%)	520 (16%)
3	Ibapah	98574	0	0%	0 (NA)	0 (NA)	0 (NA)
5	Klamath OR/CA	162667	0	0%	0 (NA)	0 (NA)	0 (NA)
3	Sheeprock Mountains	611374	0	0%	0 (NA)	0 (NA)	0 (NA)

* Numbers in parenthesis indicate the percent of acres relative to total acres of breeding bird density (75%)

FIAT - PACS


Greater Sage-Grouse
Priority Areas for Conservation
Olympia
Helena
Salem
Boise
Cheyenne
Salt Lake City
Sacramento
Carson City
Legend
State Capitals
FIAT Regions
Central Oregon
Northern Great Basin
Snake, Salmon, and Beaverhead
Southern Great Basin
Warm Springs Valley NV/Western Great Basin
N

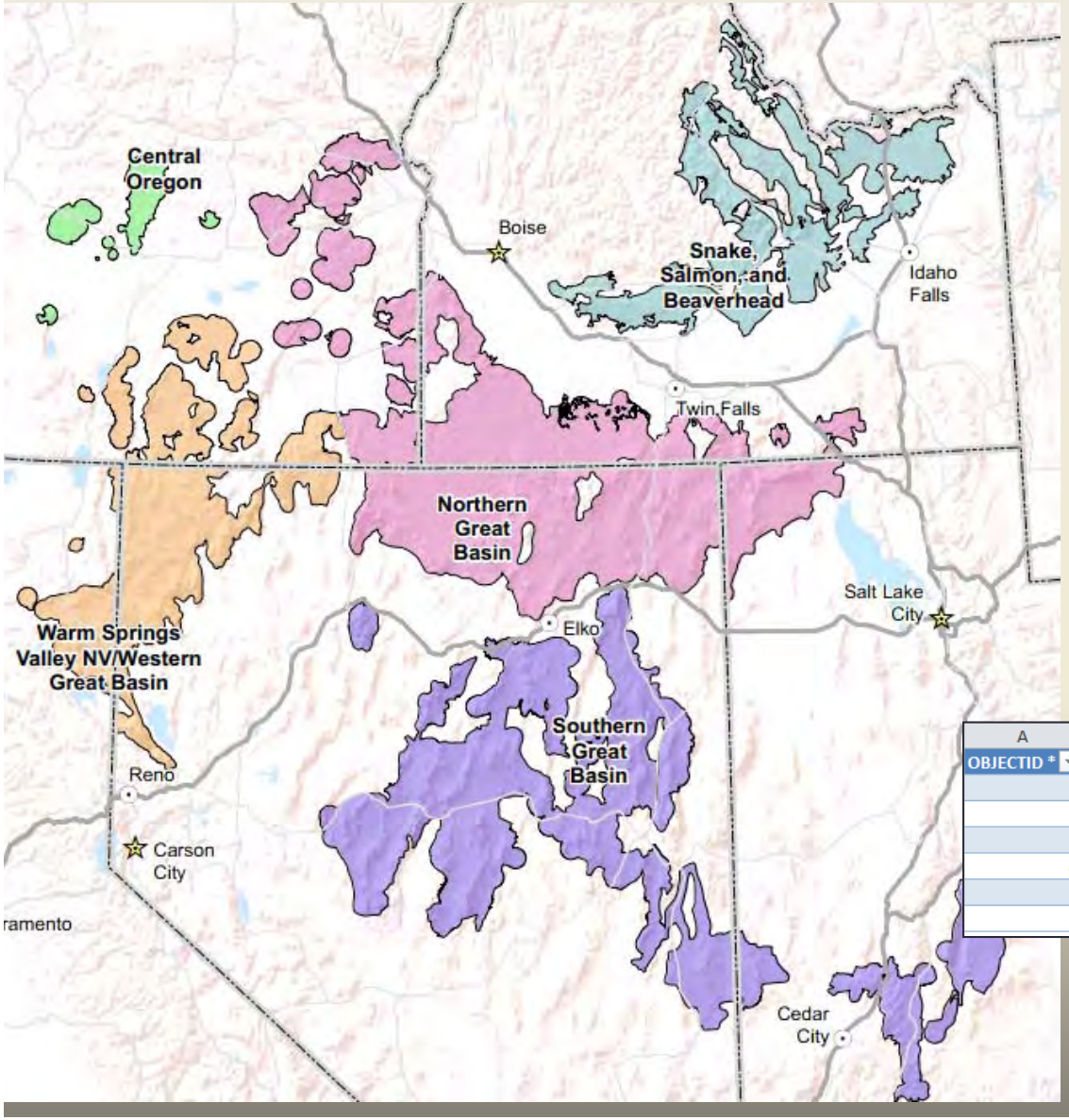
Assessment Process

Step 2 (Project Planning Areas) –

- Devise management strategies
  - Collect and evaluate local geospatial data
  - Determine appropriate management activities in or near focal habitats

❖ October 1, 2014 - March 27, 2015

Project Planning Areas



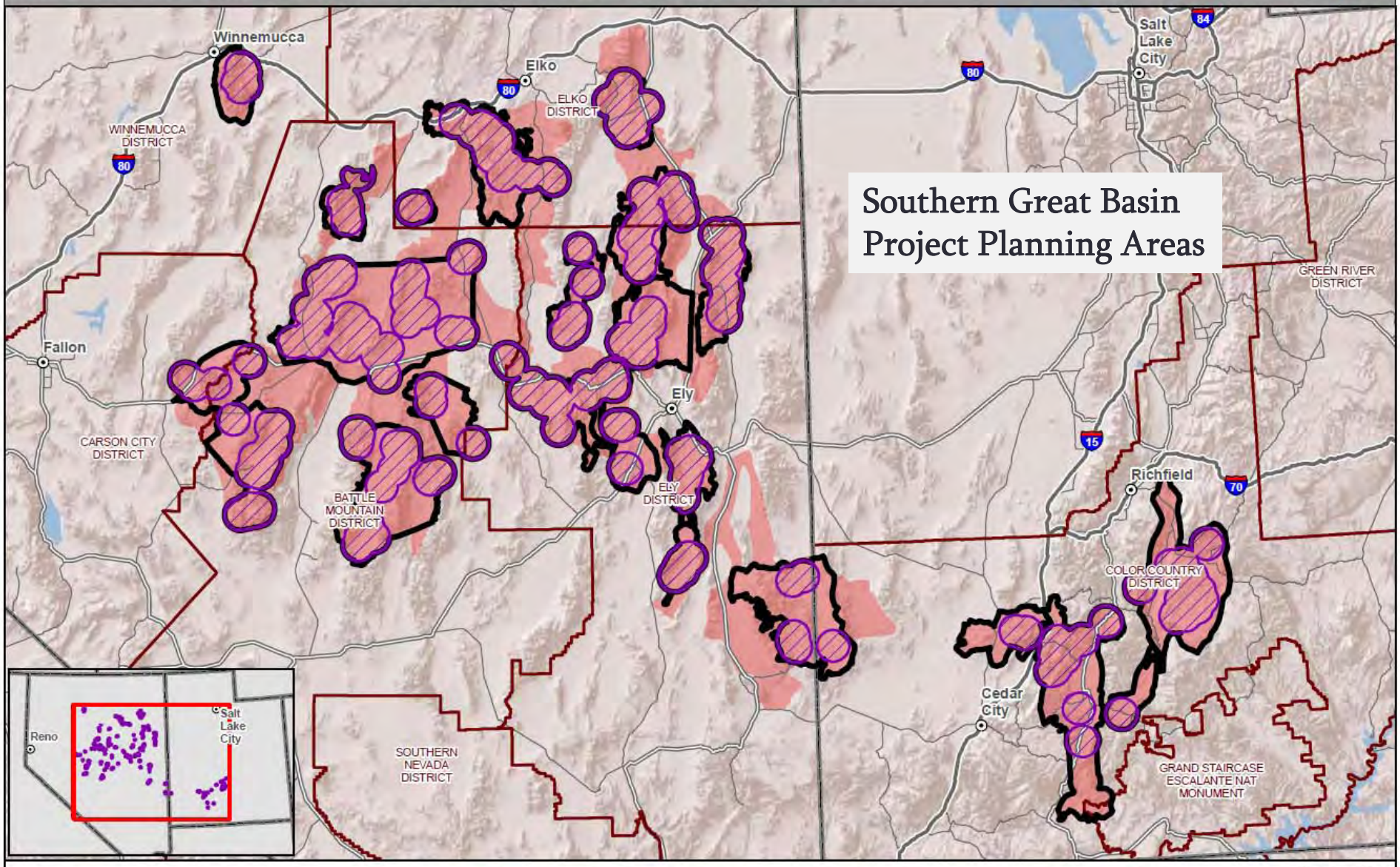
- Designated based on geographical and biological features which create a logical planning unit (e.g., clusters of focal habitats, populations, or connectivity issues)
- FIAT geodatabases contain spatial data for each PPA

A	B	C	D
OBJECTID *	SHAPE *	FIAT Project Planning Area Name *	Total Acres FIAT Project Planning Area
2	Polygon	Beaty's Butte	643612.1
1	Polygon	Clover Flat	31530.95
3	Polygon	Gravelly	29421.18
4	Polygon	North Warner	287418.5
6	Polygon	Orejana	124776.8
5	Polygon	South Warner	37522.99

Breeding Bird Density (Focal Habitat Areas)

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Breeding Bird Density 75%
Project Planning Area
Assessment Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

January 2015
Date Saved: 2/11/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

Sage-Grouse Habitat Matrix

Proportion of Landscape Dominated by Sagebrush

Resilience & Resistance of Sagebrush Community

	Low = < 25%	*Medium* = 25-65%	*High* = > 65%
	RESTORATION/RECOVERY POTENTIAL HIGH ***Native grasses and forbs sufficient for recovery*** ***Annual invasive risk low***		
High	**1A** Requires longer time, enhance connectivity.	**1B** Little intervention, enhance connectivity.	**1C** Little-to-no intervention needed.
	RESTORATION/RECOVERY POTENTIAL INTERMEDIATE *Native grasses and forbs usually adequate for recovery* *Annual invasive risk moderate* *Treatment success depends on site characteristics*		
Moderate	**2A** Requires longer timeframe and intervention.	**2B** Enhance connectivity, minimize risk of invasives.	**2C** Little intervention, minimize risk of invasives.
	RESTORATION/RECOVERY POTENTIAL LOW *Native grasses and forbs inadequate for recovery* *Annual invasive risk is high* *May require multiple management interventions*		
Low	**3A** Recovery unlikely.	**3B** Long timeframe for recovery, high amount of intervention.	**3C** Mod timeframe for recovery, moderate-high amount of intervention.

Sage-Grouse Habitat Matrix

Proportion of Landscape Dominated by Sagebrush

Resilience & Resistance of Sagebrush Community

	Low = < 25%	*Medium* = 25-65%	*High* = > 65%
High	**RESTORATION/RECOVERY POTENTIAL HIGH** ***Native grasses and forbs sufficient for recovery*** ***Annual invasive risk low*** **1A** Requires longer time, enhance connectivity.	**1B** Little intervention, enhance connectivity.	**1C** Little-to-no intervention needed.
Moderate	**RESTORATION/RECOVERY POTENTIAL INTERMEDIATE** *Native grasses and forbs usually adequate for recovery* *Annual invasive risk moderate* *Treatment success depends on site characteristics* **2A** Requires longer timeframe and intervention.	**2B** Enhance connectivity, minimize risk of invasives.	**2C** Little intervention, minimize risk of invasives.
Low	**RESTORATION/RECOVERY POTENTIAL LOW** *Native grasses and forbs inadequate for recovery* *Annual invasive risk is high* *May require multiple management interventions* **3A** Recovery unlikely.	**3B** Long timeframe for recovery, high amount of intervention.	**3C** Mod timeframe for recovery, moderate-high amount of intervention.

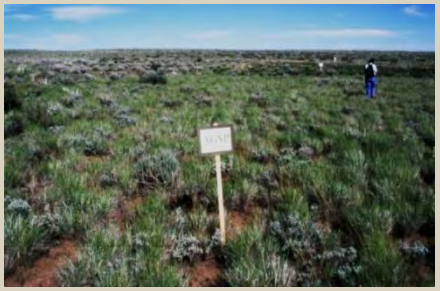
Management Strategies to Address Habitat Issues

Actions or treatments that managers typically implement to resolve habitat issues -

1. Proactive approaches

   a) Fuels management

   b) Habitat recovery/restoration



2. Reactive approaches

   a) Fire operations

   b) Post-fire rehabilitation

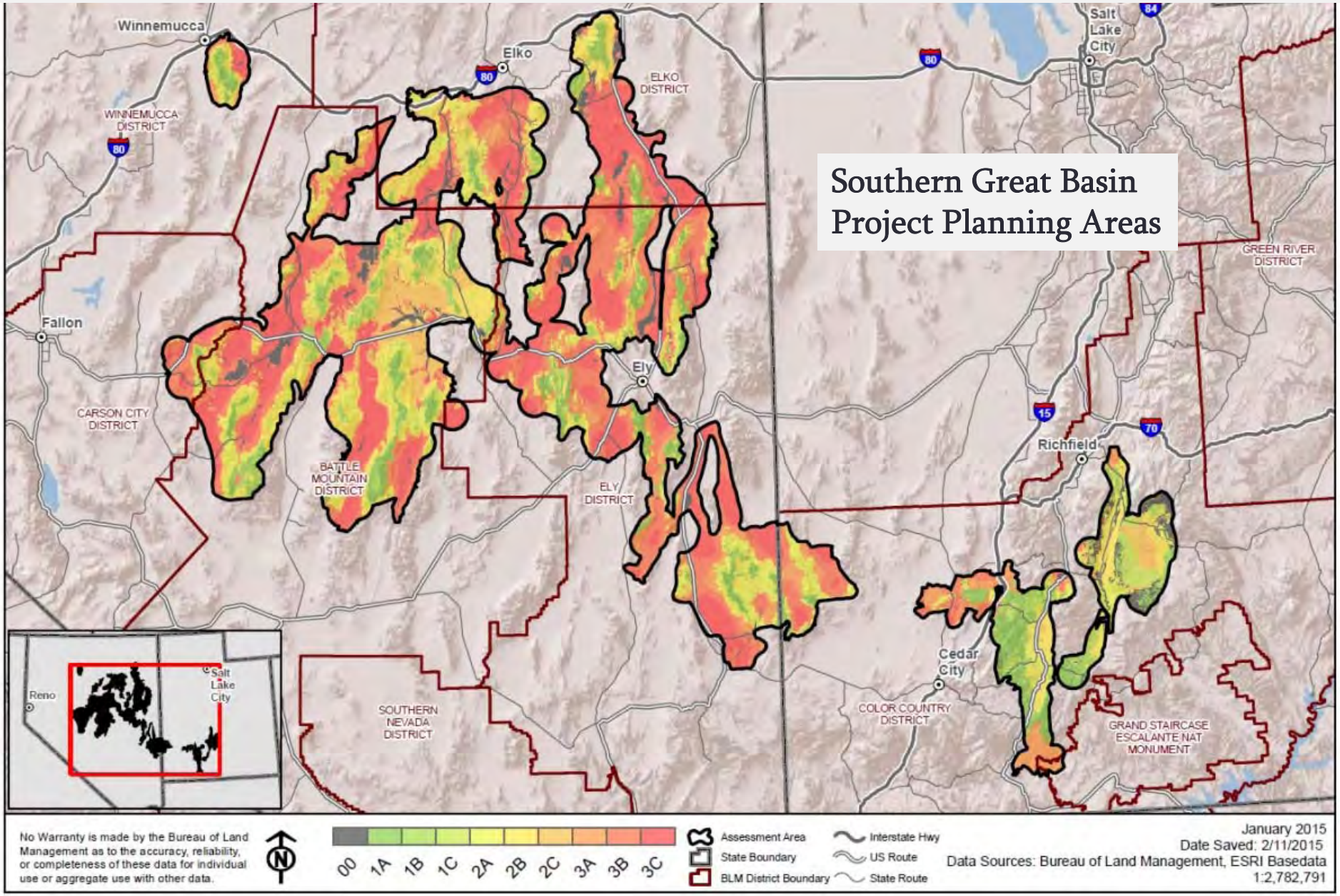
Conifer Expansion Prioritizations

- Wildfire and invasive annual grass considerations still apply as they relate to site recovery potential
- Old growth is avoided

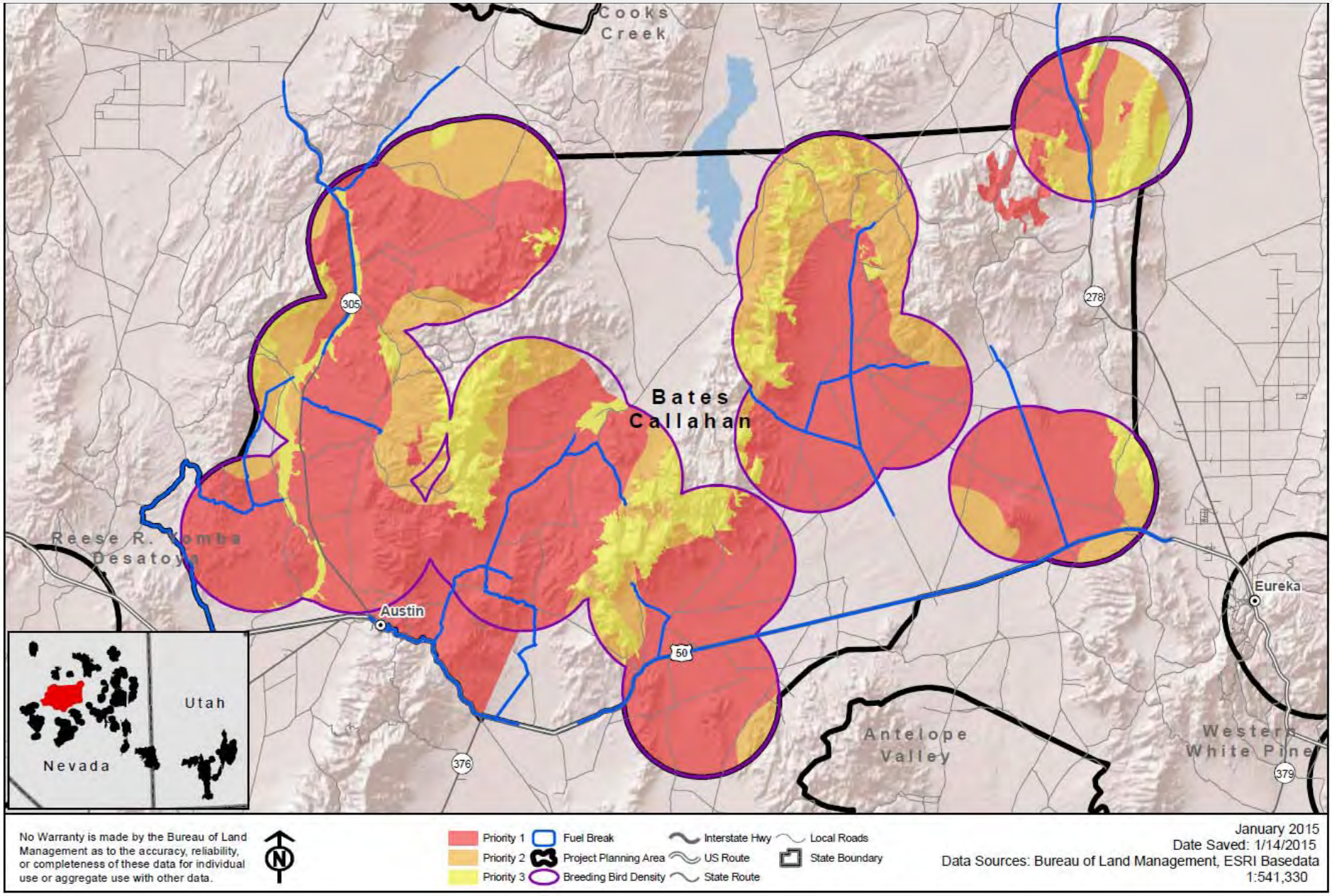
	Conifer Expansion Prioritization Proportion of Landscape Dominated by Sagebrush		
	Low < 25%	**Moderate 25-65%**	**High >65%**
Phase III	**No Treatments**	Third priority	Third priority
Phase II	**No Treatments**	First priority-75% BBD Second-Remainder of focal habitat	First priority-75% BBD Second-Remainder of focal habitat
Phase I	**No Treatments**	First-75% BBD Second-Remainder of focal habitat	First-75% BBD Second-Remainder of focal habitat

Treatment Prioritization for Wildfire and Invasives

Soil Temperature/Moisture Regimes and Sagebrush Cover

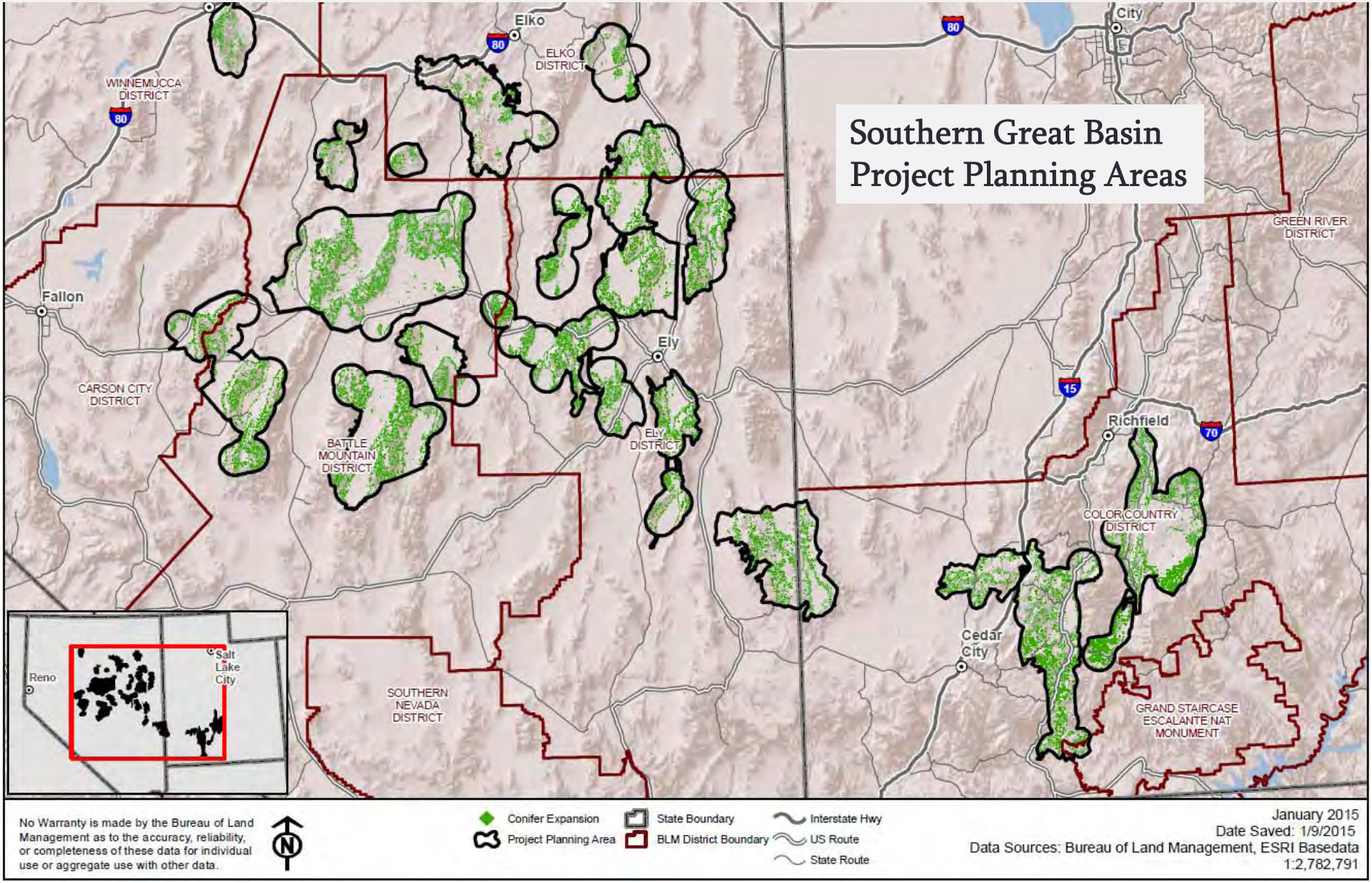


Management strategies and potential treatments Identified in and adjacent to focal habitats

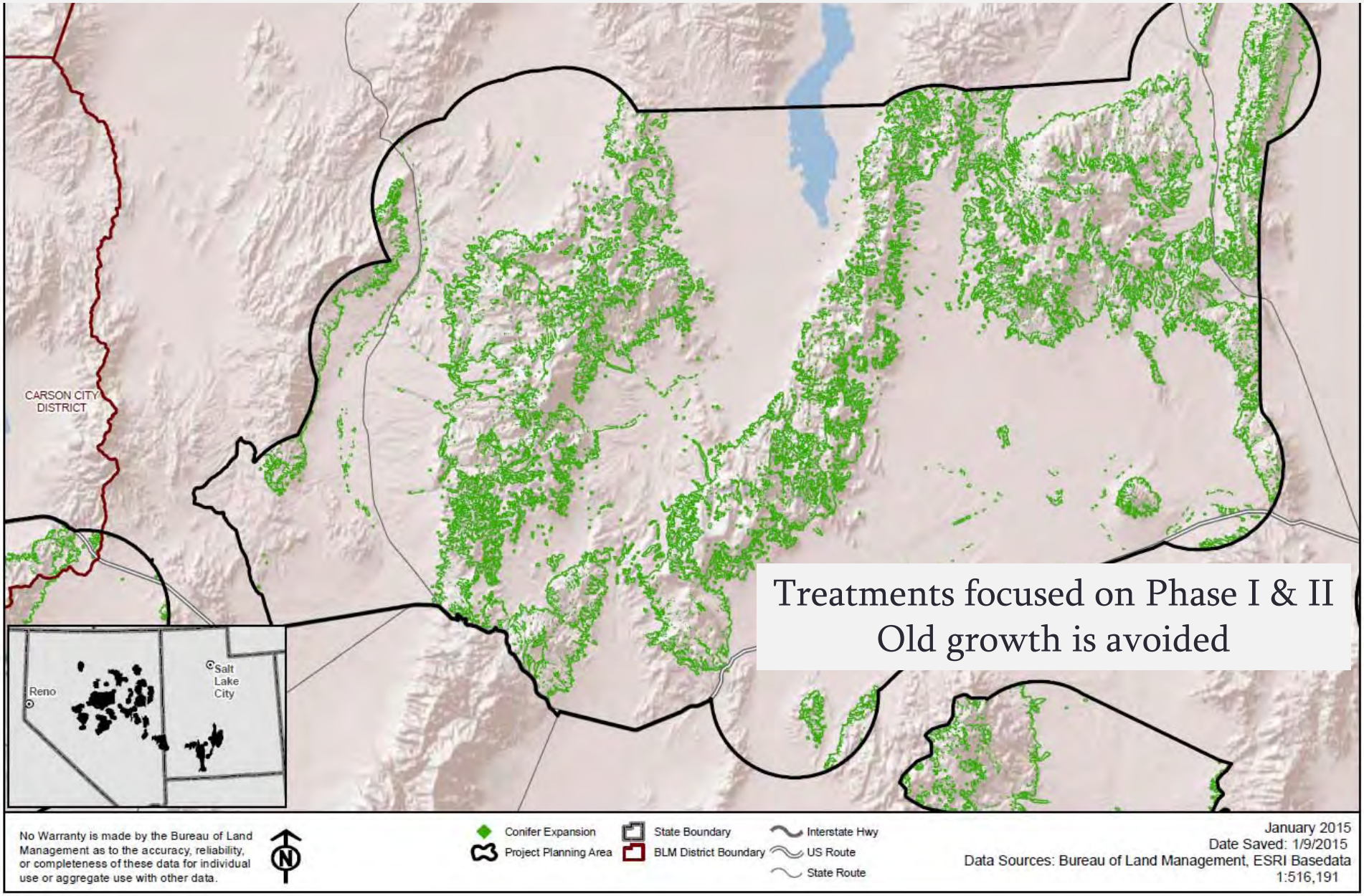


Threatment Priotization for Conifer Expansion

Data sources: REAs, LANDFIRE, Peter Coates, Ecological Site Inventories, NRCS



Potential habitat restoration treatments identified using conifer expansion data intersected with BBD and sagebrush cover



FIAT Team Leads

- Craig Goodell: Central Oregon
  (OR/WA Fire Ecologist)
- Joe Adamski: (1) N. Great Basin
  (ID Forestry Lead) (2) Snake/Salmon/Beaverhead
- Sandy Gregory: S. Great Basin
  (NV Fuels Lead)
- Ken Collum: W. Great Basin/Warm Springs Valley
  (Eagle Lake Field Office Manager)

FIAT in Summary

- Strategic, Landscape Approach
- Collaborative
- Application of management strategies based in science
- Represents an integrated framework for analysis and planning
- Answers “why here, why now?”