

Outcomes of Spatial Targeting in Sagebrush Country via the Sage Grouse Initiative

Huge thanks to....

NRCS & WLFW Leadership

Outcomes Team (CEAP)

Easement Division & Voyageur Team

Univ Montana Science Group

*David Naugle, Professor, University of Montana, and
NRCS Science Advisor, Working Lands for Wildlife*



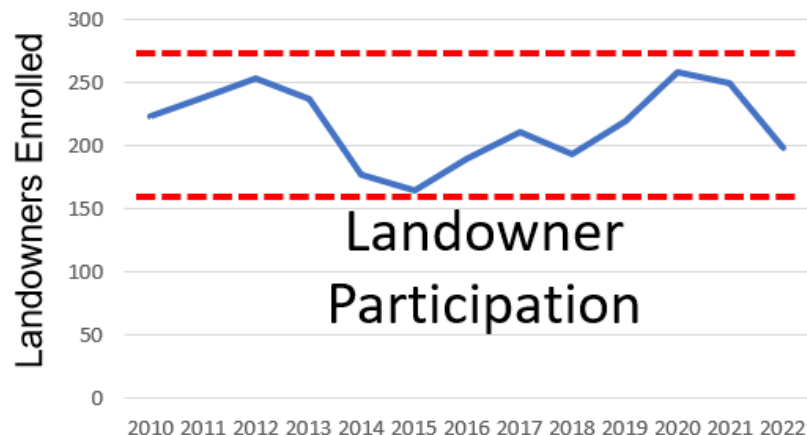
2010-2022

13 fiscal years

\$616 million invested

9.7 million acres conserved

Durability is Rare in Conservation





Unwavering Shared Vision



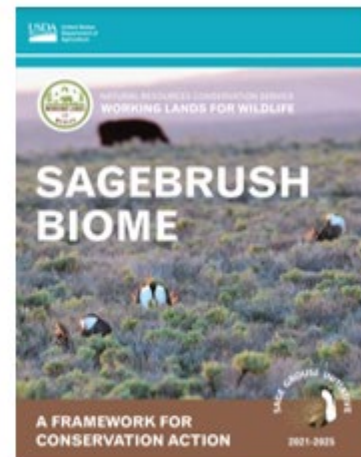
Wildlife Conservation Through Sustainable Ranching



2010

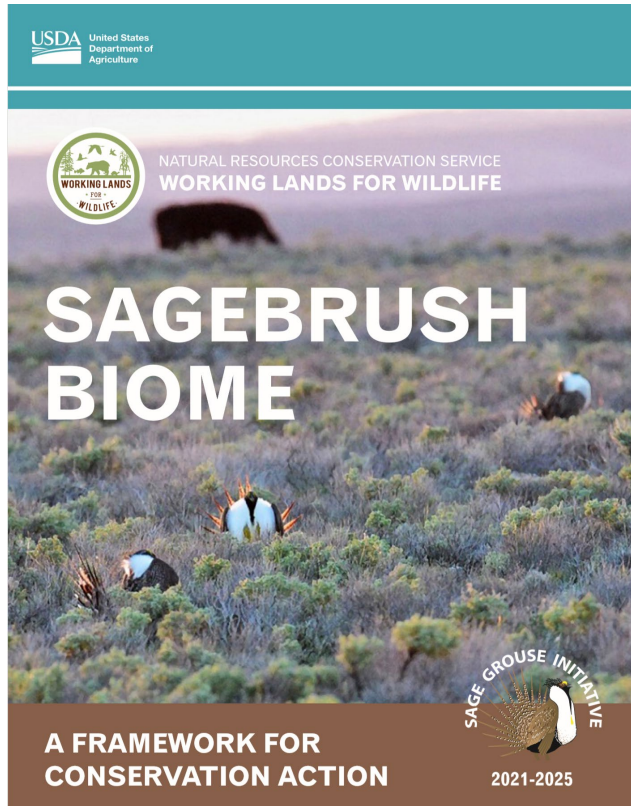


2015

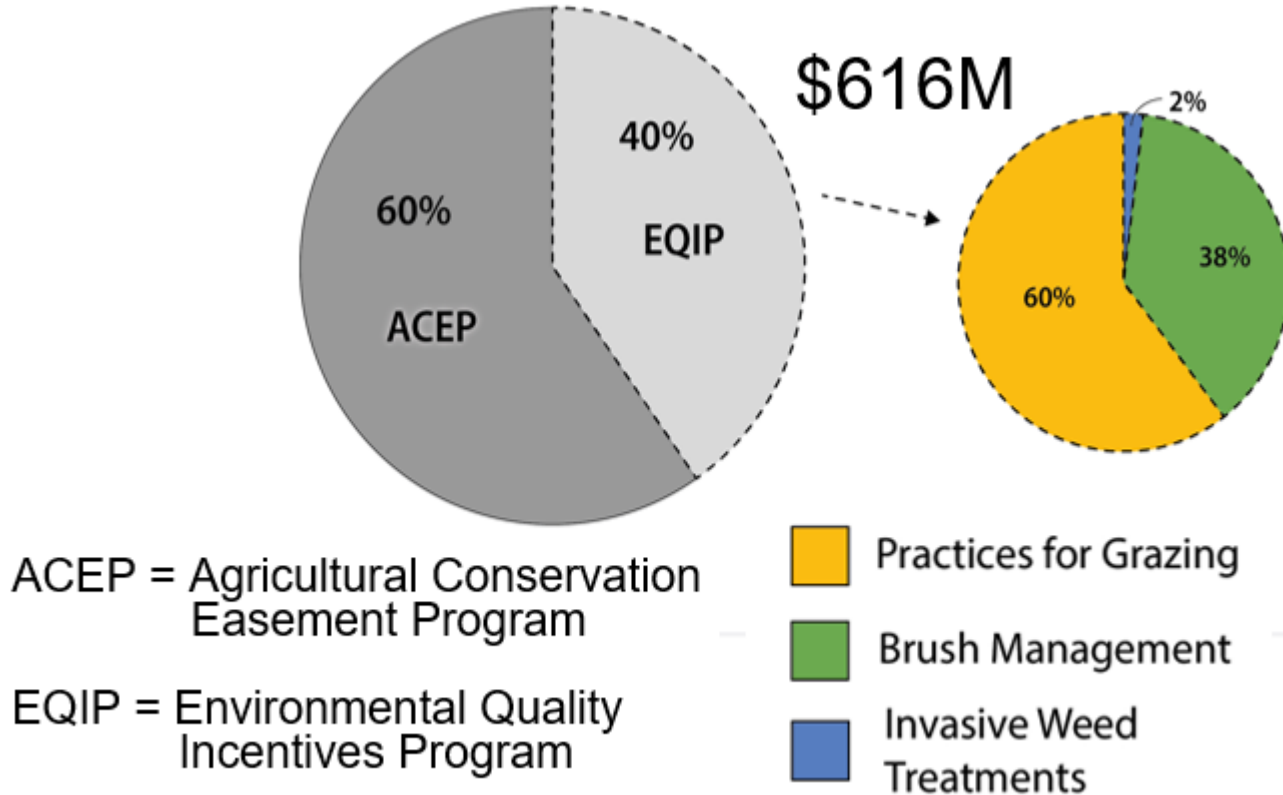


Today

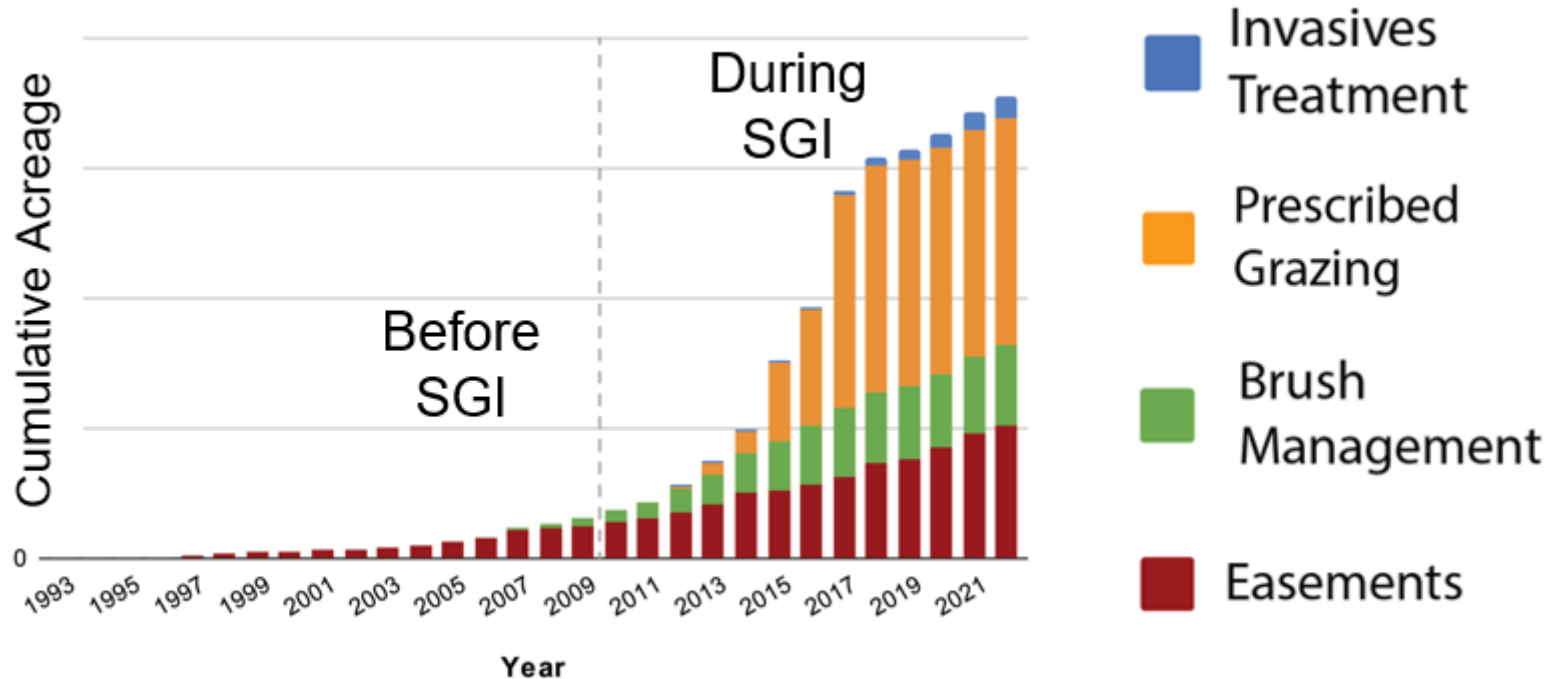
NRCS Framework for Conservation Action



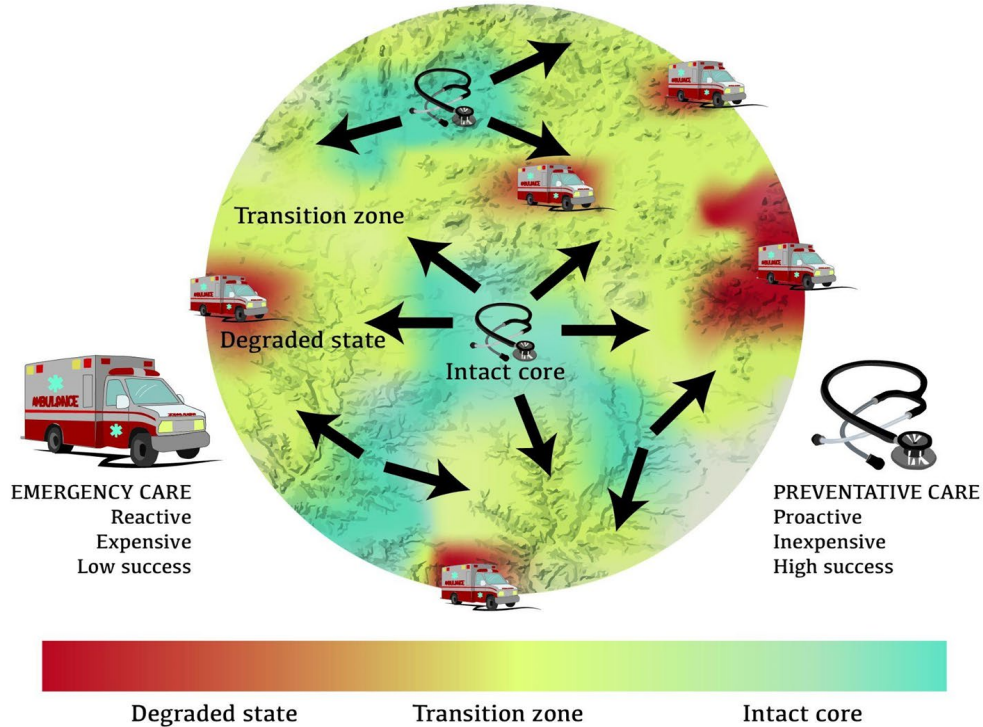
SGI By the Numbers...



Sage Grouse Initiative (SGI) marks an exponential increase in conservation investment



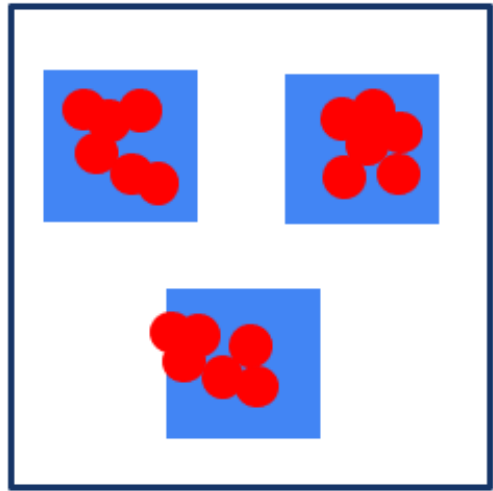
Defend the Core, Grow the Core



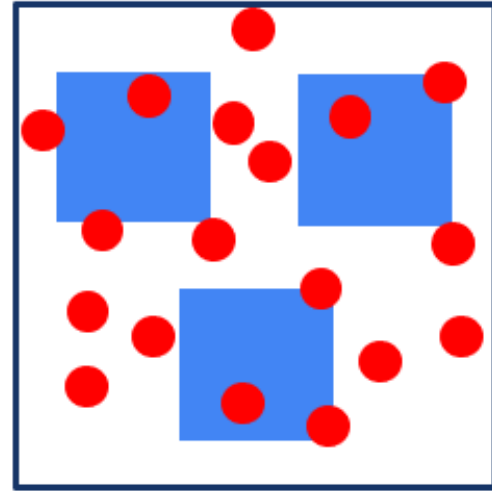
Credit: USDA-NRCS, Working Lands for Wildlife

Targeting Actions to Priority Areas

Hypothesis: Targeting =  Conservation Outcomes



Targeted



Untargeted

To answer this question...

1. Technological Advances
2. Sagebrush Conservation Design
3. Efficacy of SGI Targeting



Overarching Goal: Show How SGI Applies New Science to Adaptively Improve Future Conservation

*Defend and Grow the
Core: A Proactive Plan
for Conserving America's
Sagebrush Biome*

Initiating Peer Review
from invited authors

Publication Winter 2024



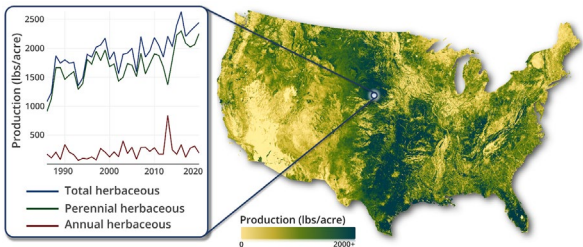
Application *accepted* as a
Special SRM Symposium


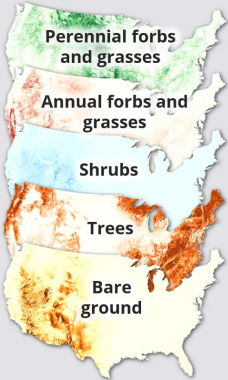




Recorded presentations
& Future Webpage for
NRCS Staff

Technological Advances

RANGELAND ANALYSIS PLATFORM

- ▶ Easy to use monitoring data to help land managers and scientists sustainably manage and conserve grassland resources.
- ▶ Track the response of vegetation cover and production to drought, wildfire, and management.
- ▶ Data available for all of CONUS; 30-meter resolution; 1986 – present.

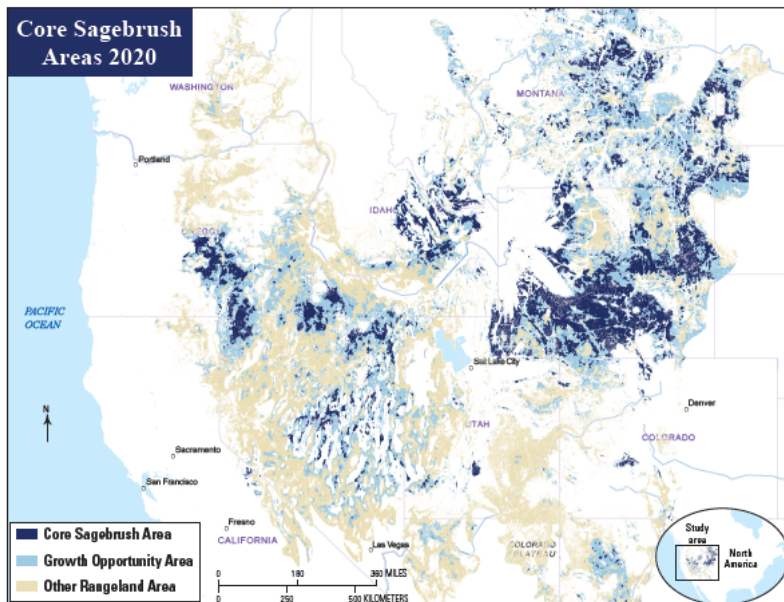


	 Vegetation Cover	Rangeland Production
<i>Data layers</i>		
<i>Frequency</i>	Annual 	16-day  Annual 
<i>Units</i>	Percent cover	Pounds/acre

Informed by NRI and
AIM plot-level data

Prepared in cooperation with the Western Association of Fish and Wildlife Agencies and the U.S. Fish and Wildlife Service

A Sagebrush Conservation Design to Proactively Restore America's Sagebrush Biome



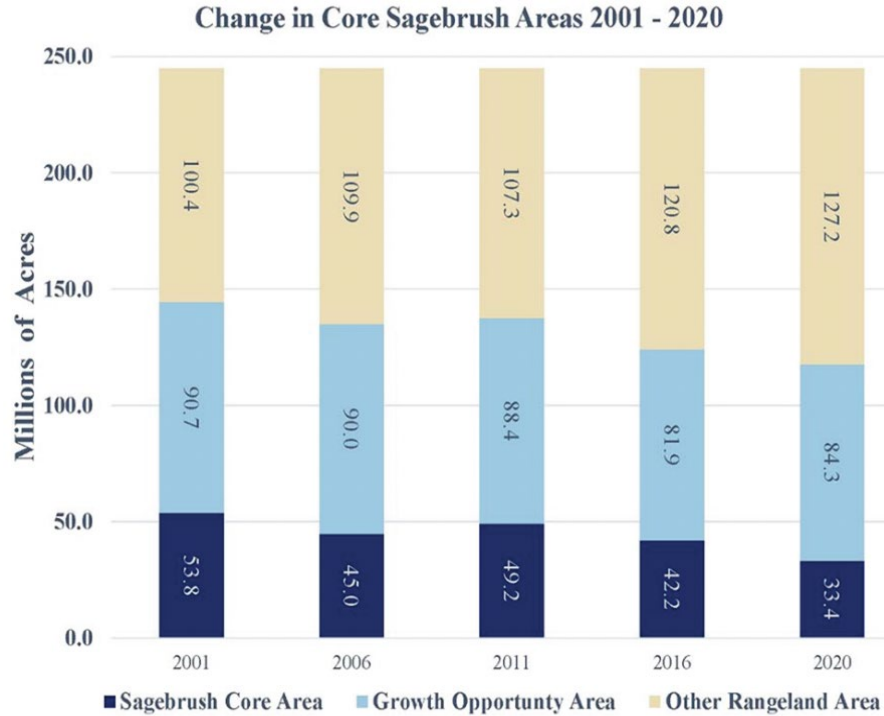
Sagebrush Conservation Design (SCD)

- Developed by interagency team to support ecosystem-based conservation strategy
- Maps ecological integrity of sagebrush system over time
- Published in 2022 enabling retrospective SGI evaluation

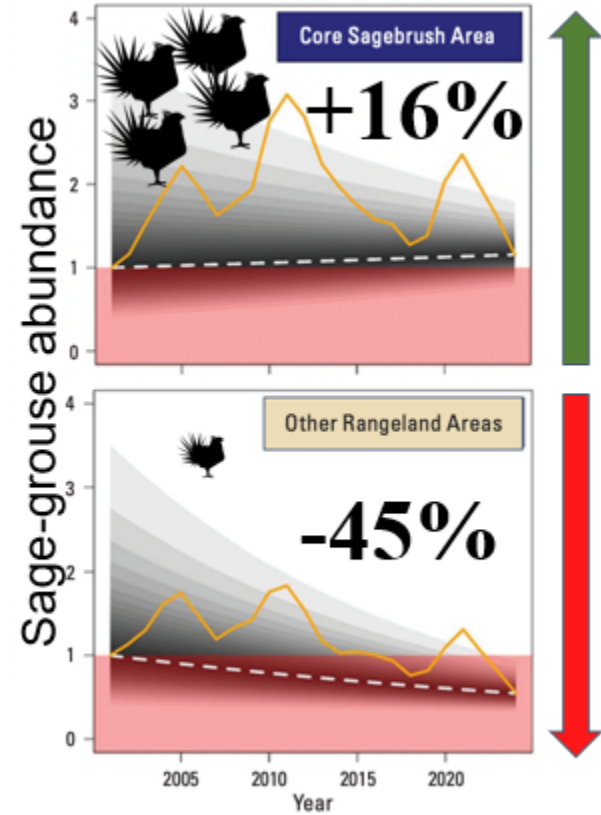
+26.8M
Other
Rangeland
Areas

-6.4M
Growth
Opportunity
Areas

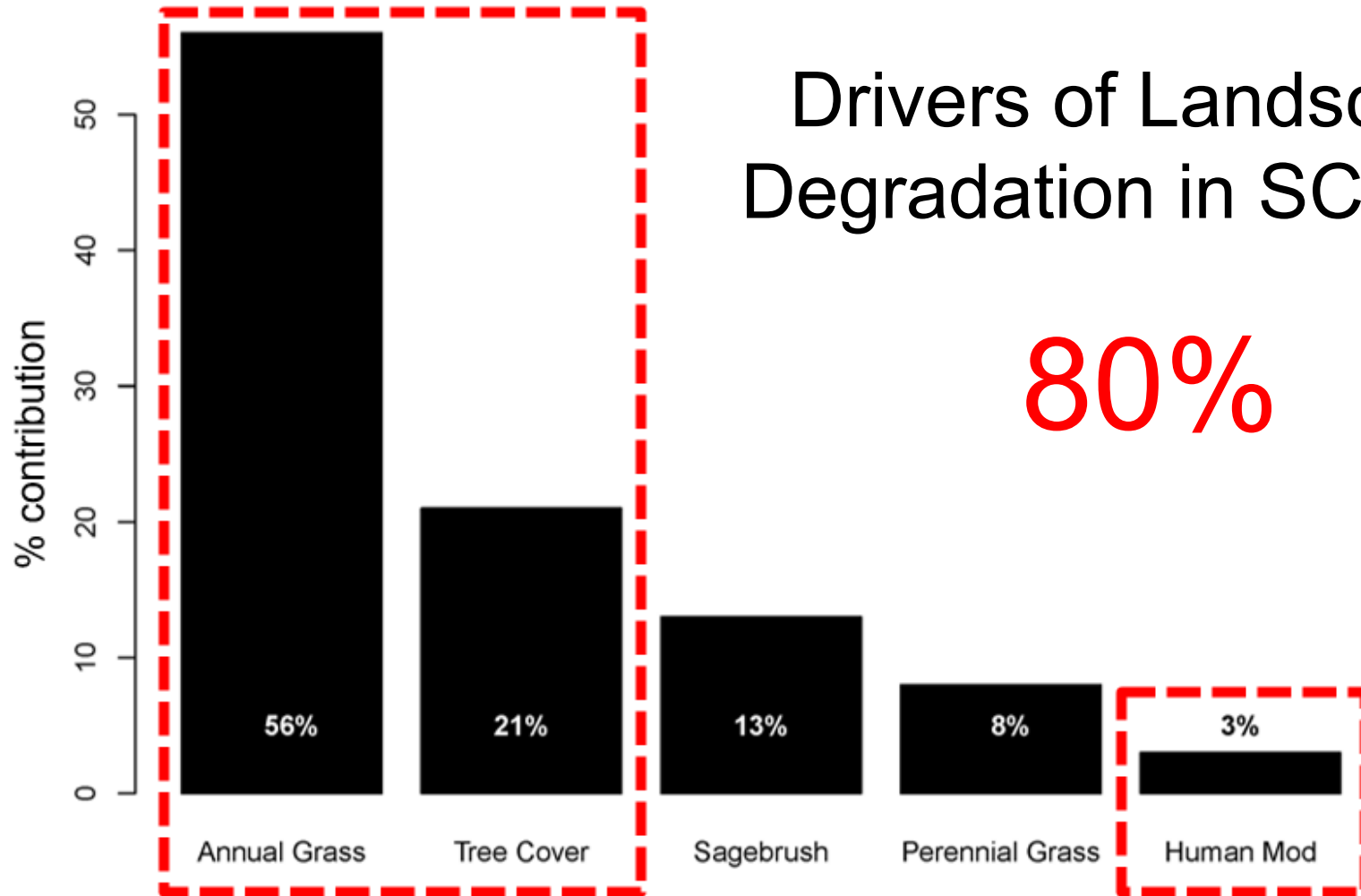
-20.4M
Core
Sagebrush
Areas



**Cores support 51% of world's
sage-grouse population**



Drivers of Landscape Degradation in SCD (%)



Sagebrush Ecological Integrity Scores

$Q_{\text{annual grass}}$

Q_{trees}

$Q_{\text{sagebrush}}$

$Q_{\text{peren grass}}$

$Q_{\text{human mod}}$

Scaled 0-1
&
Multiplied

***Sagebrush
Ecological
Integrity***

Sagebrush Ecological Integrity



“Sagebrush Core Area”

Upper two deciles

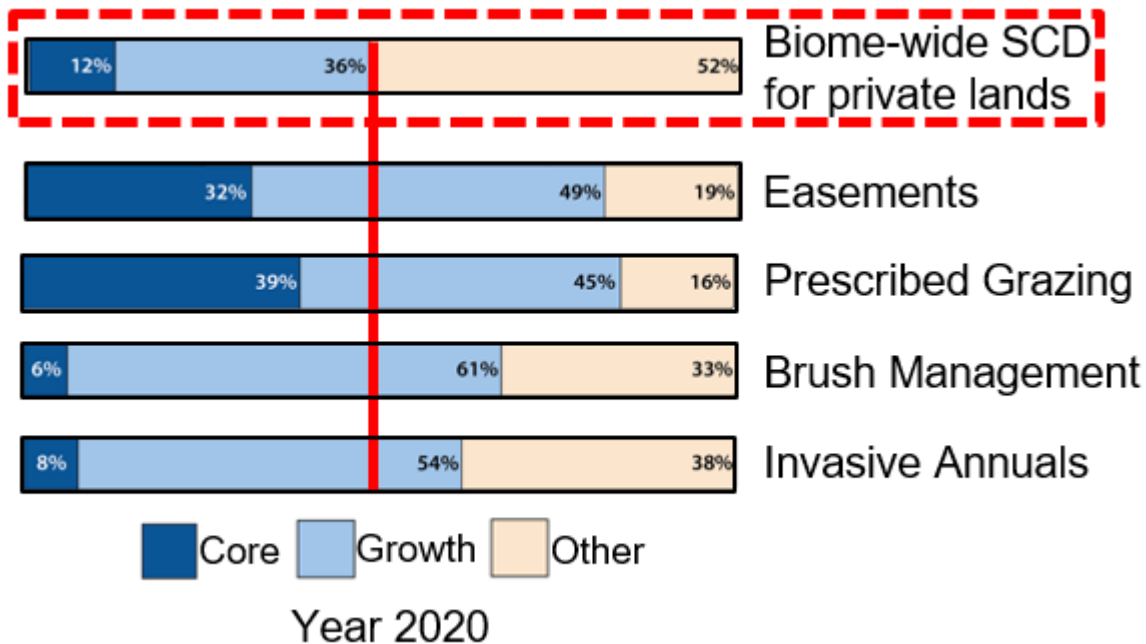
“Growth Opportunity Area”

Middle five deciles

“Other Rangeland Area”

Lower three deciles

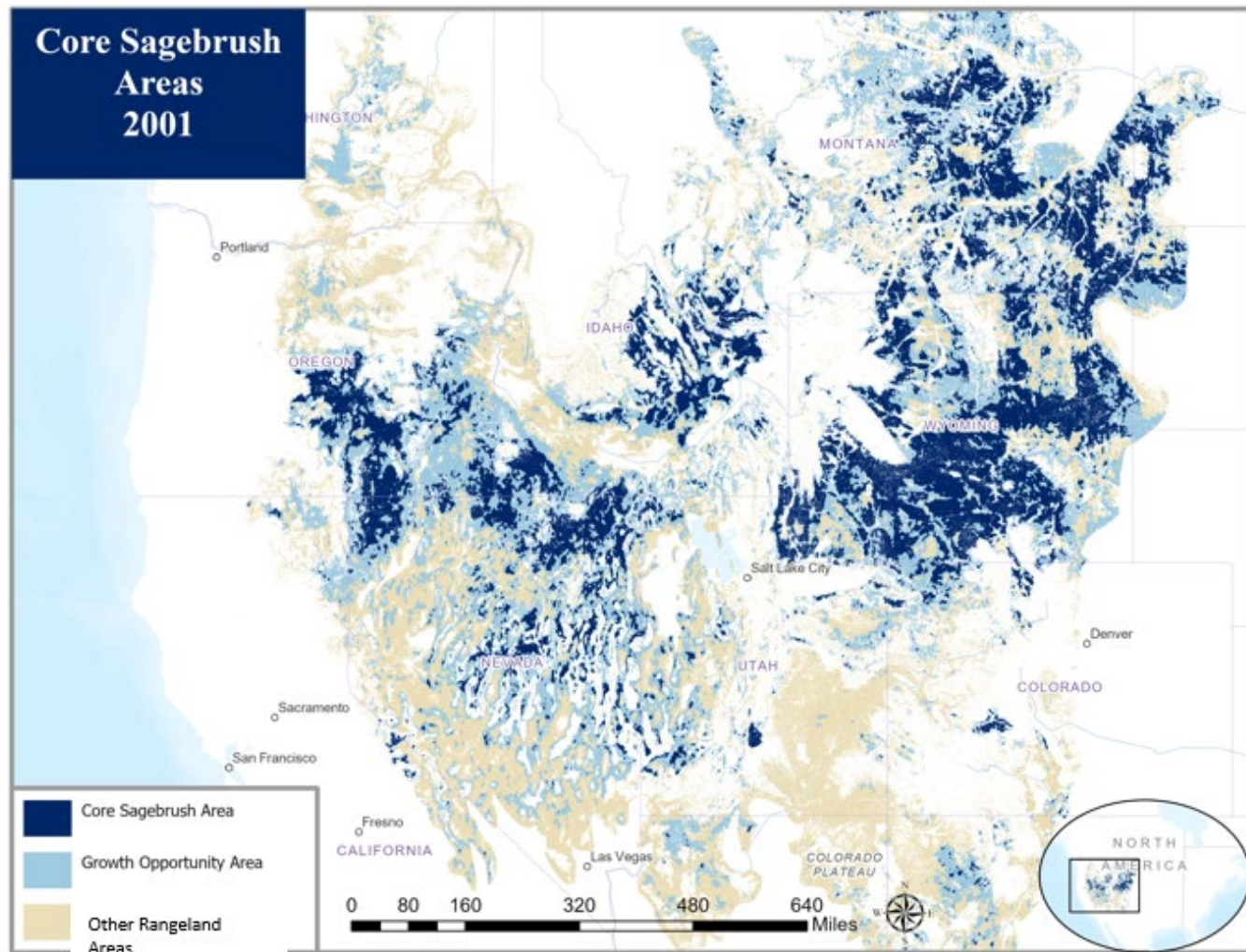
Efficacy of SGI Targeting



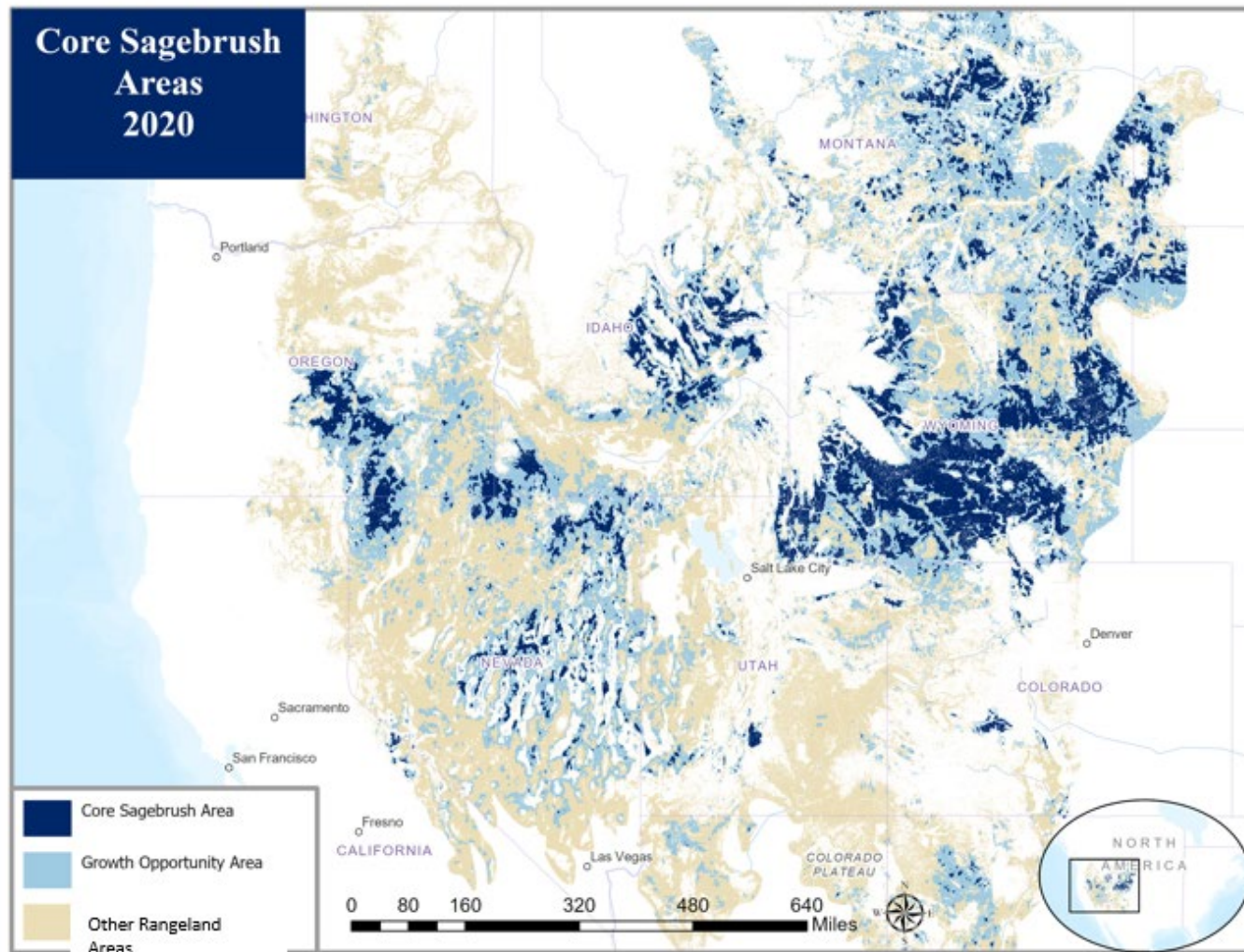
3 Take-homes

- 62-84% of SGI practices are within SCD's Core & Growth priorities
- SGI targeting is up to a third (13-36%) more efficient than random allocation across private lands
- SGI's 'Defend the Core' approach is largely avoiding areas of low conservation success

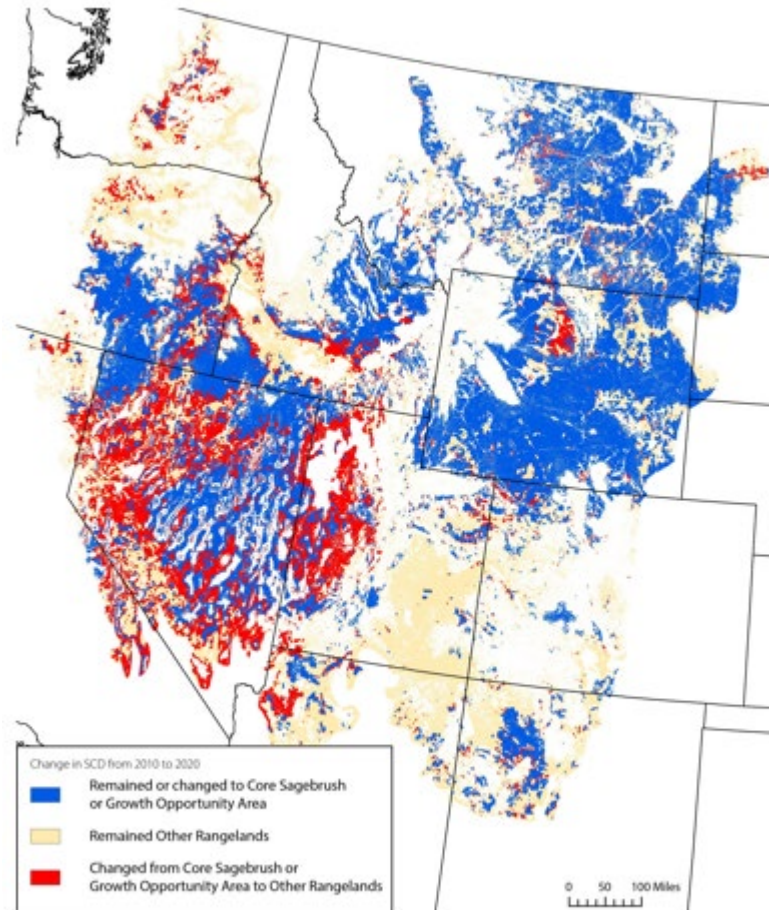
Core Sagebrush Areas 2001



Core Sagebrush Areas 2020

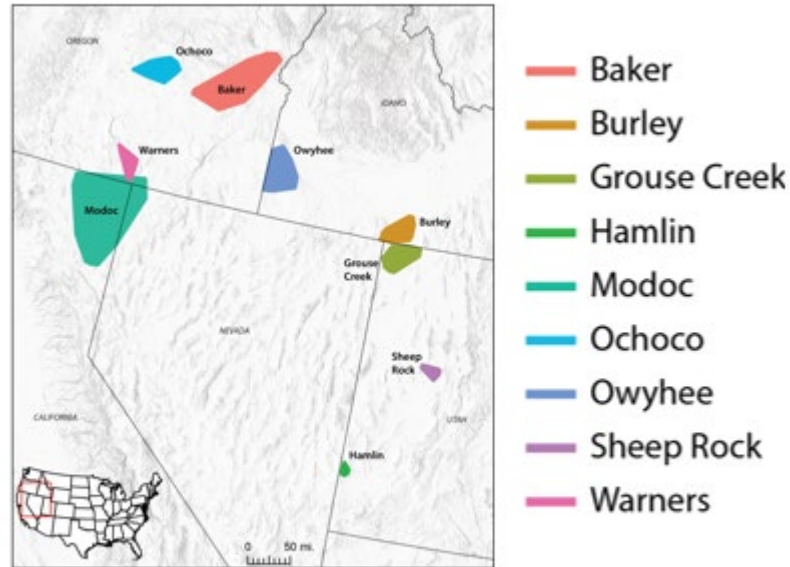


Change in SCD 2010-2020



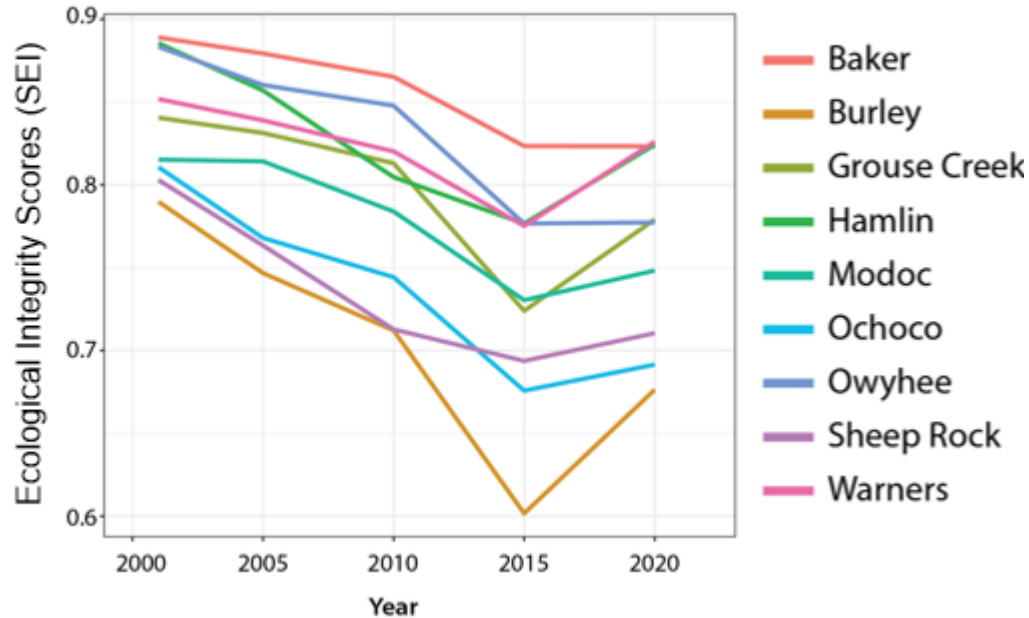
'Defend the Core, Grow the Core' Requires Landscape Thinking

Conifer Removal*



*coining these as '**Legacy Landscapes**' that contain 80% of all SGI cuts

Effective Core Defense



Take-homes

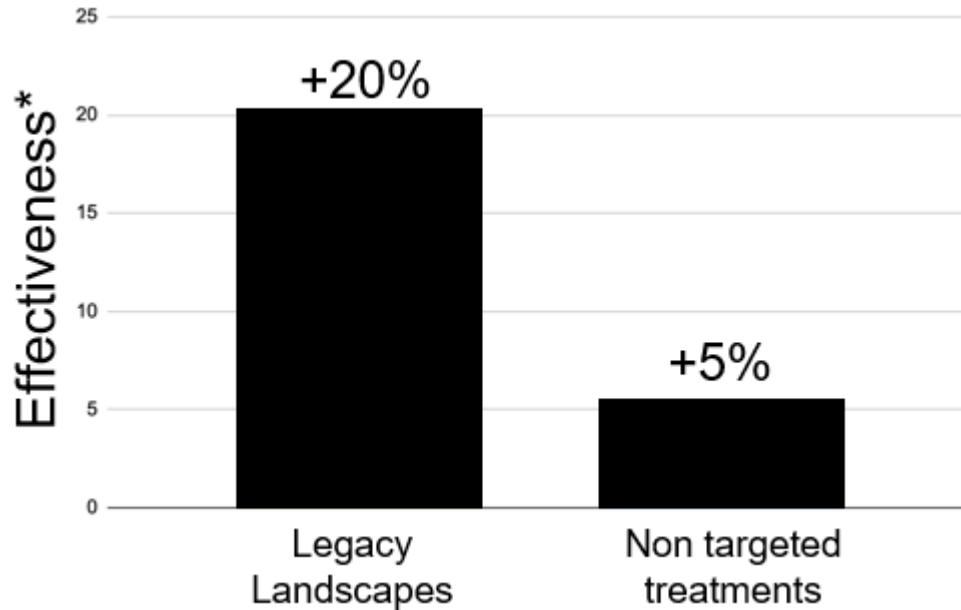
- SEI scores show that SGI has either reversed (7) or halted (2) degradation of nine Great Basin landscapes
- Saturating these nine landscapes proactively defends and grow core



Conservation outcomes measured from space



Targeting & Saturating Cores

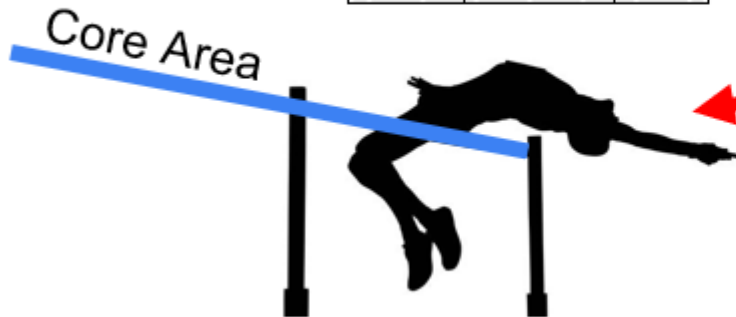
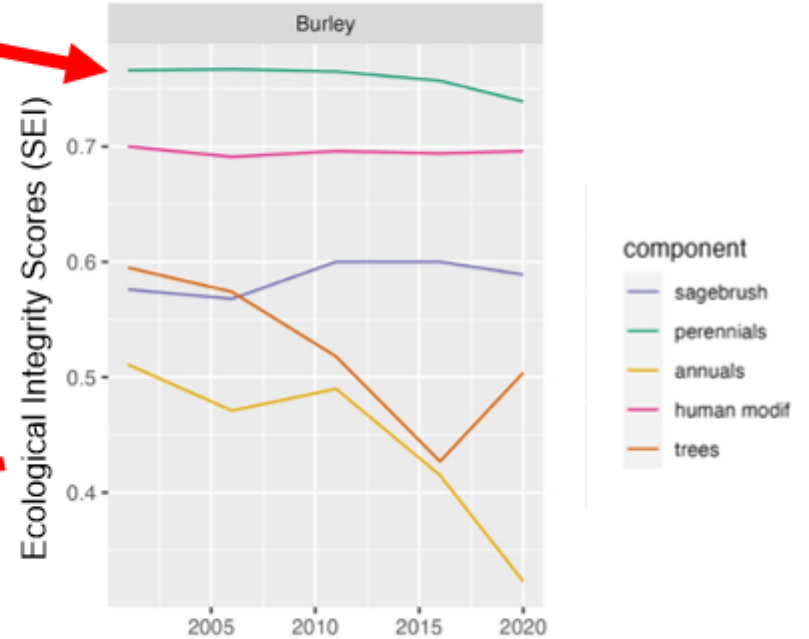


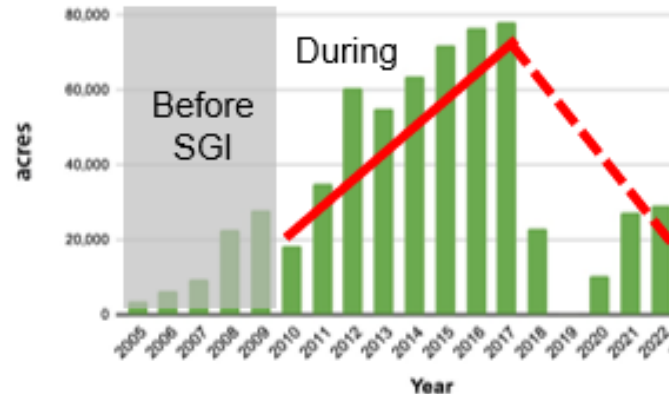
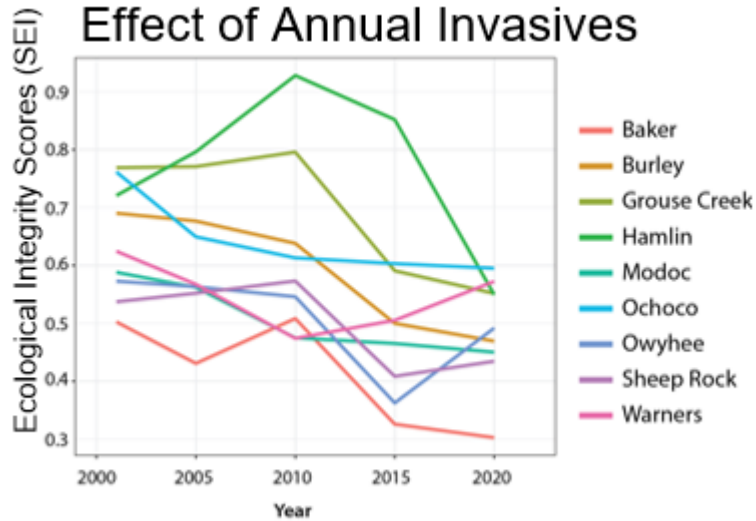
**Effectiveness shown as fraction of cut areas that improved or maintained Core & Growth status relative to background rates of change*

Take-homes

- Targeting and saturating cores is 4x more effective at defending and growing cores
- Untargeted and scattered cuts are a less effective approach to conservation

Invasive Annuals Impacting Ecological Integrity Despite Initial Success



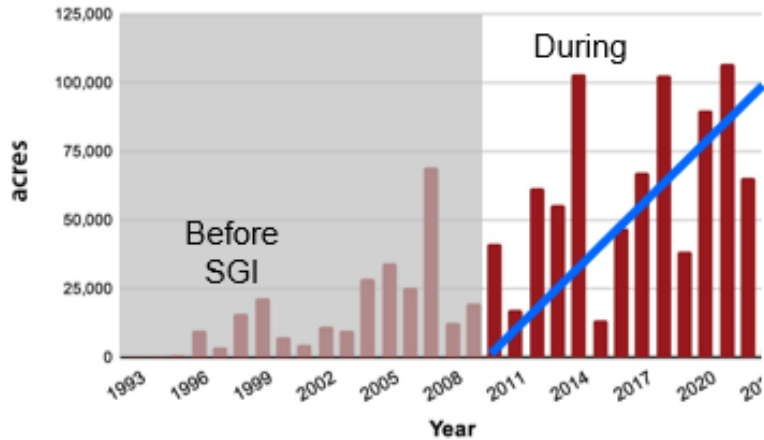


Take-homes

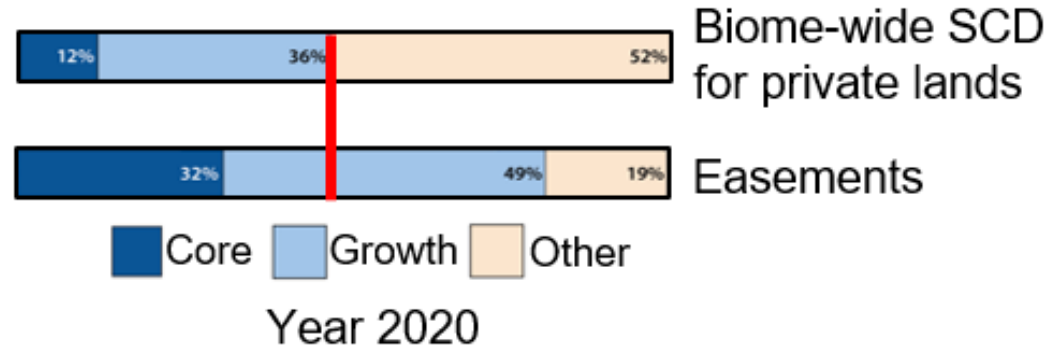
- Addressing annual invasives would maintain integrity of initial SGI investments and return more legacy landscapes to Core status
- Legacy landscapes will require retreatment of new tree saplings
- Declining acreage in Great Basin likely to be offset by increasing cuts east of Rocky Mountains

Land Use Change & Easements

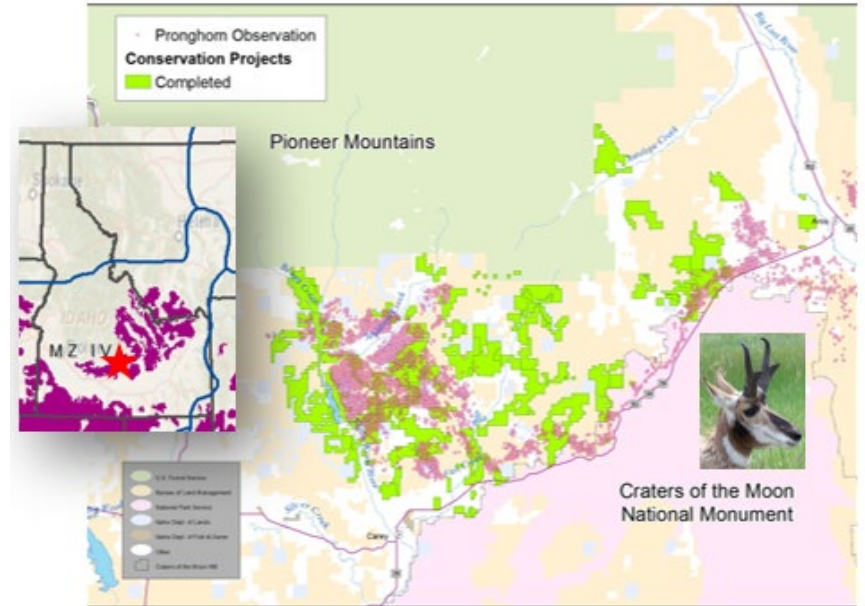
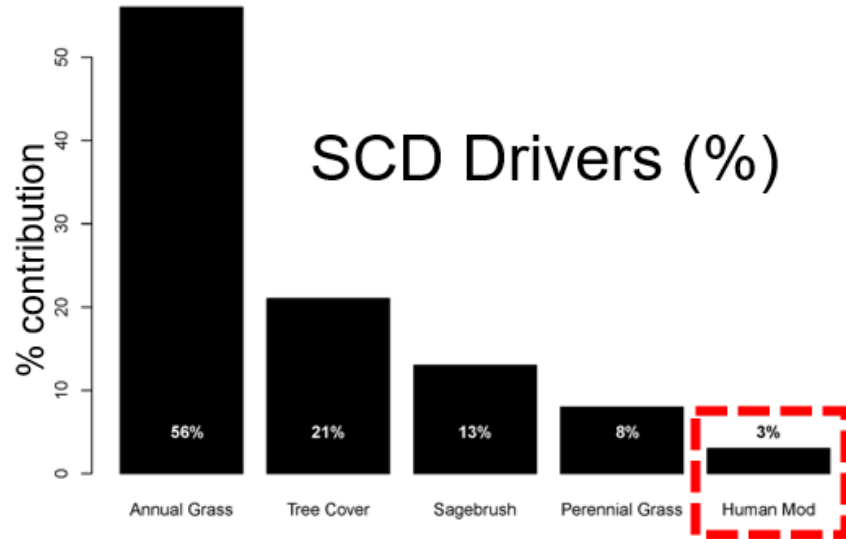
SGL Easement Acquisitions Are on the Rise



Easements Are Among SGI's Most Targeted Actions

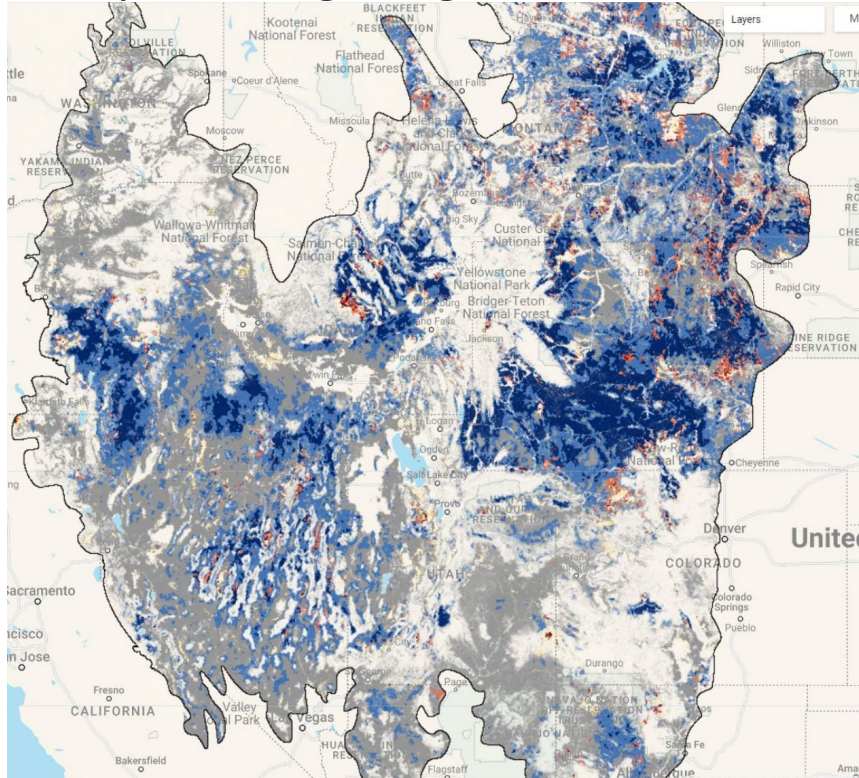


Targeting and Saturating Cores Critical for Easements Too!



Saturating Pioneer Mountains
in central Idaho to halt
threat of subdivision

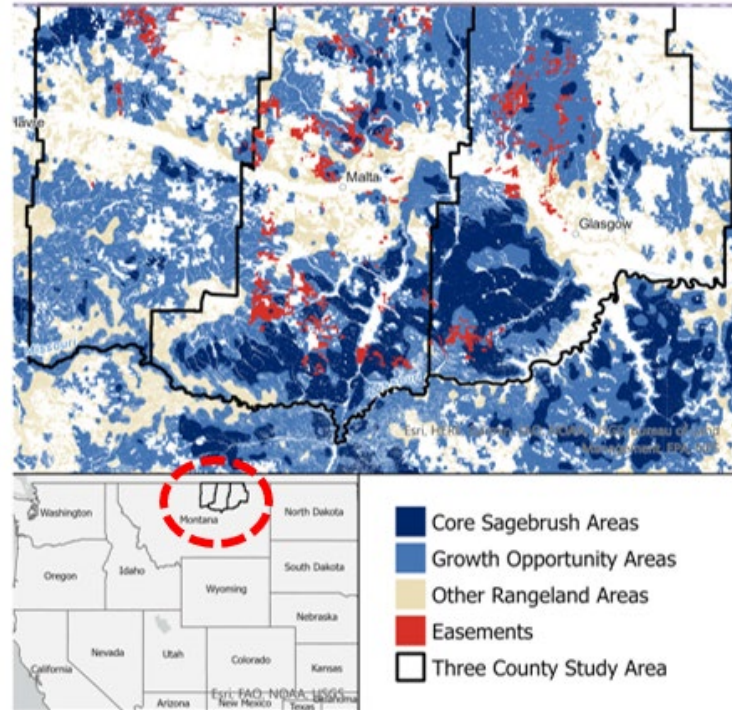
New 2023 Cultivation Risk Map for Targeting Easements

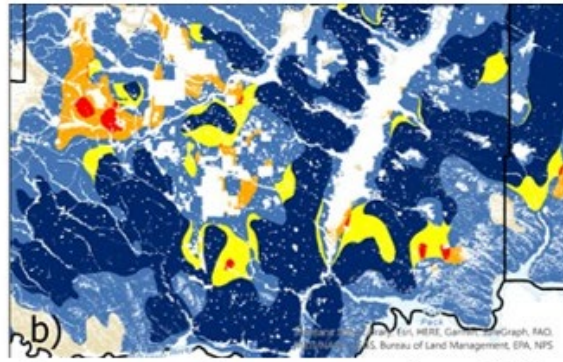


	Other Rangeland Areas	Growth Opportunity Areas	Sagebrush Cores
No to Low (0-0.3)	44 %	29 %	12 %
Moderate (0.3-0.7)	6.2 %	3.9 %	1.0 %
High (0.7-0.98)	2.0 %	0.8 %	0.1 %
Very High (>0.98-1.00)	0.1 %	0.03 %	0.002 %

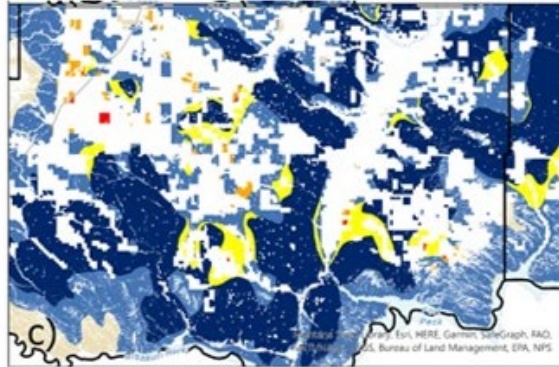
~5% of Core & Growth

Simulating Averted Loss: What Happens to Montana's Largest Core If Existing Easements Were Cultivated?





Easements conserving 3.6x
the amount of core outside as
inside their boundaries



80% of those benefits
extend to BLM public lands

Current Ecological Integrity

- Core Sagebrush Area
- Growth Opportunity Areas
- Other Rangeland Areas

Simulated Degradation

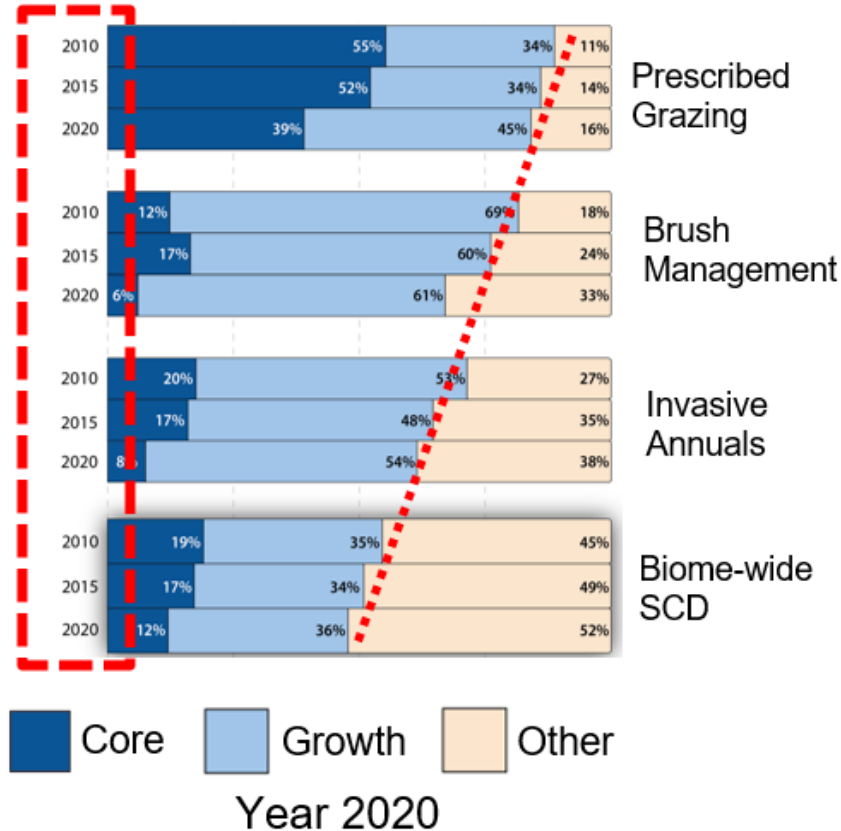
- Core to Growth
- Growth to Other
- Core to Other

Take-homes

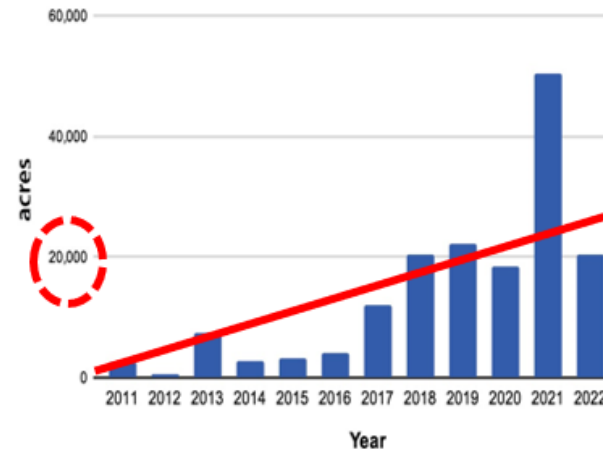
- Proactively targeting at-risk ranchlands and saturating landscape with easements averting disintegration of Montana's largest core area
- Conservation benefits extend beyond easement boundaries
- Easements on private lands increase ecological integrity of adjacent public lands

Look to the Future

Take-homes



- Invasives are largely responsible for declining ecological integrity over time
- SGI just beginning to treat invasives at large scales



SGI Science Shapes the Conservation Narrative

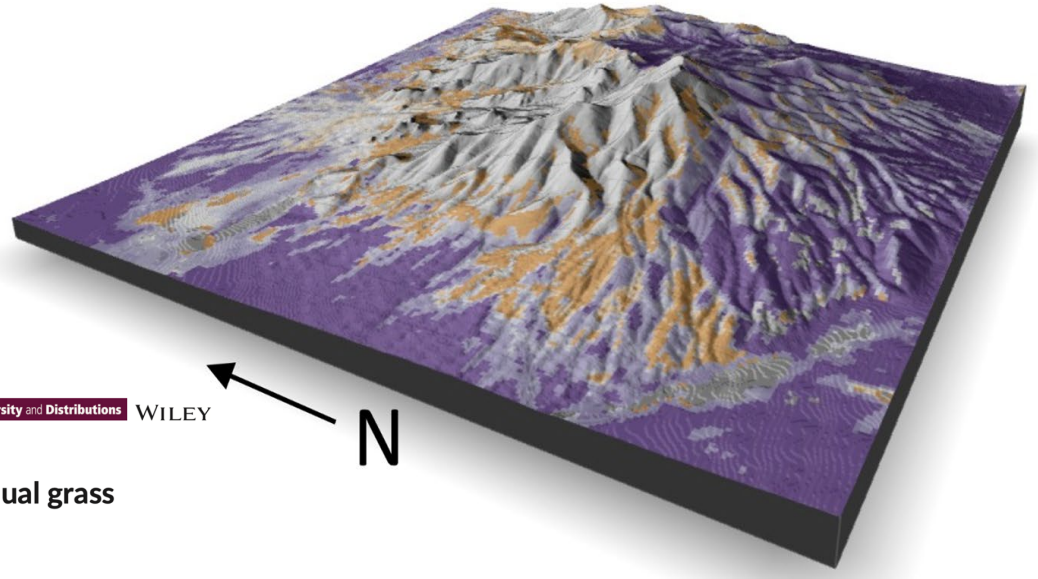
In Great Basin, annual grass-dominated area expanding by 890 mi² annually and moving up slope

RESEARCH ARTICLE

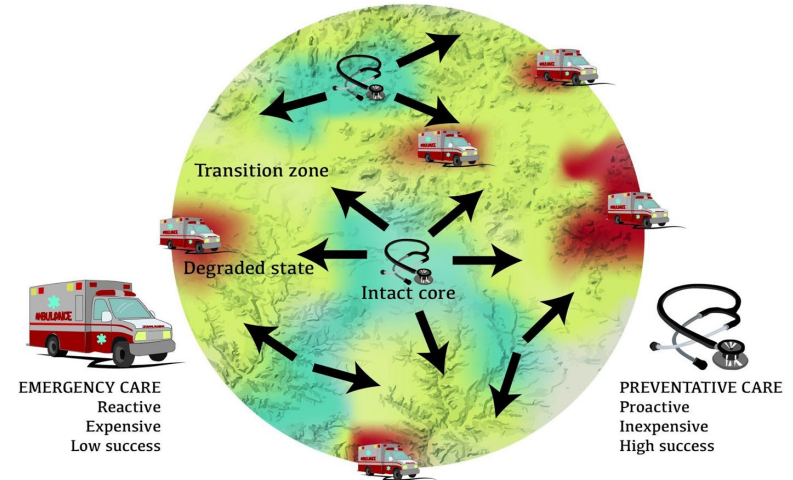
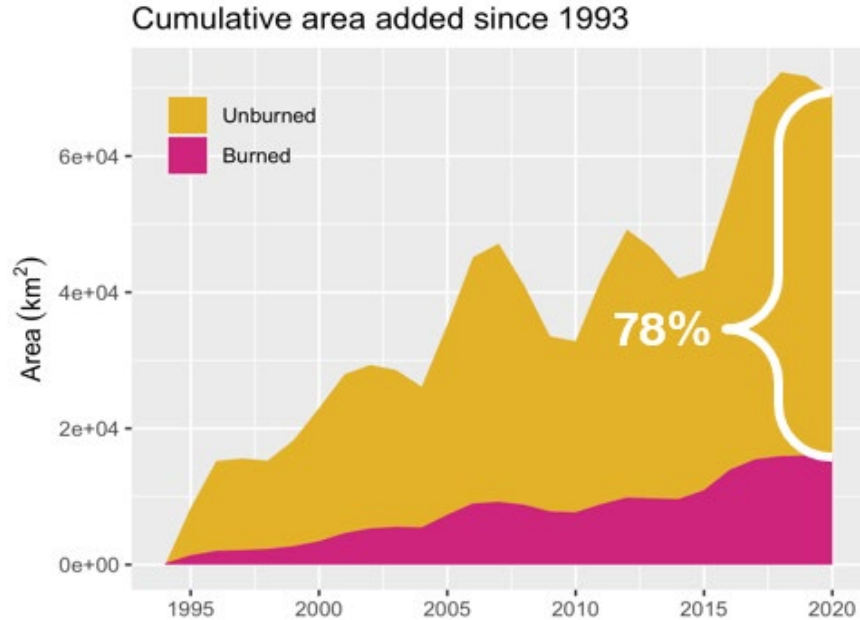
Diversity and Distributions WILEY

The elevational ascent and spread of exotic annual grass dominance in the Great Basin, USA

Joseph T. Smith¹ | Brady W. Allred^{1,2} | Chad S. Boyd³ | Kirk W. Davies³ |
Matthew O. Jones¹ | Andrew R. Kleinhesselink¹ | Jeremy D. Maestas⁴ |
Scott L. Morford¹ | David E. Naugle²



~80% of Newly Invaded Rangeland by Cheatgrass are Unburned



New Strategy to 'Defend the Core' from Invasive Annuals!

Defend the Core

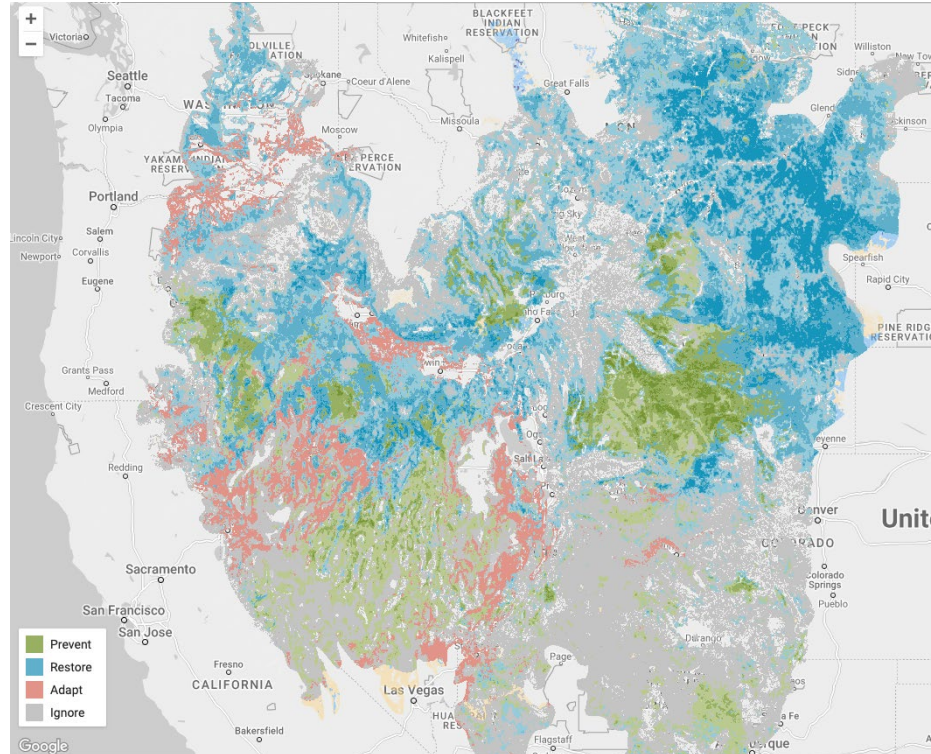
Promote resistance, manage propagule pressure

Grow the Core

Actively suppress invasives and enhance perennials

Adapt and Contain

Prioritize fire prevention and fuels management; prevent spread



Science Already Informing Conservation Delivery



- WLFW and West National Technology Support Center / University of Wyoming delivering new trainings
- New practice payment scenario for Practice 315 (Herbaceous Weed Treatment) launched in FY23
- Practice 315 added to the FY24 Climate-Smart Agriculture and Forestry Mitigation Activities List
- NRCS States leading efforts like the Idaho Cheatgrass Challenge



Closing Summary



- NRCS-led SGI is a primary catalyst for rangeland conservation throughout the West
- Spatial technologies enabling NRCS to quantify conservation outcomes at biome levels
- SGI is successfully targeting most actions (62-84%) to Core and Growth priorities
- Targeted woodland management is restoring ecological integrity; despite success, follow-up treatment of invasive annuals would safeguard initial investments
- Well-targeted easements avert the loss of Montana's largest Core area, while increasing the ecological integrity of adjacent public lands
- SGI's next frontier is scaling up annual invasives to Defend and Grow Cores!



<https://www.wlfw.org/>

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Info@wlfw.org

Photo Courtesy: Joe Smith, University of Montana

LandscapeExplorer.org

