



United States Department of Agriculture

# Sage Grouse Initiative 2.0

Investment Strategy, FY 2015-2018  
***COLORADO focus***



Natural Resources  
Conservation  
Service

August 2015

**Report graphics by Jesse Meza. Cover photos courtesy of Jeremy R. Roberts, Ken Miracle and Tatiana Gettleman.**

LETTER FROM THE CHIEF

## NRCS' Commitment to Sage Grouse

**Since 2010, the Sage Grouse Initiative (SGI) has served as the model for voluntary, incentive-based conservation at its best. Through conservation science and partnerships at the federal, state and local levels, we're making a huge impact for conservation and agriculture at a time when it's needed most. In this report, we lay out our renewed commitment to this partnership through 2018 and demonstrate the effectiveness these investments can have in bringing back sage grouse populations, while helping to improve ranching operations at the same time.**

USDA's Natural Resources Conservation Service (NRCS) launched SGI in 2010 to target efforts that sustain the working rangelands that support sage grouse and 350 obligate species for the long-term. Using Farm Bill conservation programs, we're addressing non-regulatory threats facing the grouse, mainly fragmentation of their habitat, which is the primary reason for the sage grouse's candidate designation under the Endangered Species Act. Through SGI, we're applying the right conservation practices in the right places to maximize our return on investment.



SGI is making a difference because private landowners voluntarily work with us to produce results on the ground. The decisions Western ranchers and other private landowners make every day about what to do on their land will continue to have a critical impact on sage grouse.

The results speak for themselves. Today, 1,129 ranches across 11 Western states are conserving 4.4 million acres of land — an area of working lands twice the size of Yellowstone National Park. We have reduced habitat fragmentation by establishing more than 451,000 acres of conservation easements. These easements maintain large and intact working ranches, and often times they connect with other habitats on public lands.

Privately-owned grazing lands underpin 40 percent of sage grouse range and constitute some of the most productive habitats available. Through implementation of 2.4 million acres of grazing systems since 2010, SGI is helping ensure those lands are managed sustainably to provide productive sage grouse habitats long term while supporting the local economy on working lands.

We've also greatly enhanced 405,241 acres of otherwise suitable habitat by removing invading conifer trees. Focusing removal on early successional sites in priority habitats ensures maximum benefits for sage grouse conservation.

In addition to benefits to wildlife, we're also preventing a loss of 60 percent of the available forage for livestock. Half of our SGI conifer effort has been invested in Oregon where we have now reduced more than 68 percent of the conifer threat on priority private lands.

We've come a long way since 2010, and we have no intention of slowing down. This report describes the significant investments NRCS plans to make through the life of the 2014 Farm Bill. These aren't random acts of conservation – we are looking to invest in the comprehensive plans put forth by the Western states and the public land management agencies. Our planned investments will complement the great work occurring throughout the West and provide our partners with a roadmap to fill unmet needs by rallying around a cohesive strategy. It is intended to be a living document, informed by the best available science and the priorities of our partners to make meaningful, targeted investments that will have a real impact for the species and bolster the productivity of working lands.

We're calling this effort SGI 2.0, and NRCS is committing approximately \$211 million to this partnership through 2018. NRCS has already invested \$296.5 million in SGI, and our partners have brought another \$128 million to the table. With the anticipated partner match on these new investments, we expect that by the end of 2018, around \$760 million will have been invested through SGI, conserving up to 8 million acres of sage grouse habitat.

SGI would not exist without the hard work and commitment from our partners — states, conservation districts, wildlife and agricultural groups, land trusts and other federal partners. And our most important partner — the ranchers who are doing their part to improve outcomes for sage grouse.

SGI is living proof that wildlife and agriculture can coexist and thrive together. You've heard it before — what's good for the bird is good for the herd. The steps we're taking to improve habitats and outcomes for sage grouse and other wildlife are good for cattle, good for ranching operations, and good for America's rural economy.

A handwritten signature in black ink, appearing to read "J. Weller". The signature is fluid and cursive, with a large loop at the end.

**Jason Weller**  
Chief, USDA Natural Resources Conservation Service

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# Executive Summary

The greater sage-grouse, an iconic ground-dwelling bird of the West, has experienced significant population declines during the past 50 years from habitat loss. The U.S. Fish and Wildlife Service (FWS) designated sage grouse in 2010 as a candidate for listing under the Endangered Species Act (ESA).

In September 2015, the FWS will determine whether to list the greater sage-grouse under the ESA or find that ongoing efforts to restore and protect sagebrush habitat are sufficient to ensure their long-term survival. Loss and fragmentation of sage grouse habitat is the primary threat and has a number of contributors, including human development and encroachment of conifer trees and invasive plants.

NRCS is working with ranchers to address these threats on private lands through restoring and protecting key sage grouse habitat while ensuring grazing lands remain sustainable and profitable. NRCS launched the Sage Grouse Initiative (SGI) in 2010 to focus efforts that reduce threats facing sage grouse and the working lands that provide their habitat.

NRCS uses a variety of Farm Bill conservation programs to restore and protect habitat, including habitat improvements through the Environmental Quality Incentives Program (EQIP) and long-term conservation easements through the Agricultural Conservation Easement Program (ACEP). Since 2010, NRCS has invested more than \$296.5 million to implement SGI. Conservation partners and landowners have contributed an additional \$128 million, bringing the total SGI investment to \$424.5 million.

## **Sage Grouse Initiative 2.0**

NRCS plans to commit approximately \$211 million to SGI over the life of the 2014 Farm Bill, providing partners with certainty that conservation will continue well into the future. SGI 2.0 will invest around \$93 million in habitat restoration through EQIP and \$100 million in

conservation easements through ACEP. NRCS will invest the remaining \$18 million to support SGI staff and partners who work with ranchers and other partners to implement conservation actions on the ground and quantify resulting outcomes.

This four-year commitment combined with funds leveraged by partners will bring the total SGI investment to approximately \$760 million. Already underway in 2015, additional resources are enabling SGI to nearly double past achievements, putting SGI on the path to conserve about 8 million acres by 2018.

NRCS also plans to add the Conservation Stewardship Program (CSP) as another tool for conservation, beginning with a pilot in 2015 of up to 275,000 acres. CSP, like EQIP, provides technical and financial assistance to ranchers who restore habitat. Through the new Regional Conservation Partnership Program, NRCS partners have opportunities to propose projects that benefit sage grouse habitat.

Agency leaders and partners worked together at the state level to describe priorities for reducing threats to sage grouse habitat, identifying locations for projects and cost estimates. SGI 2.0 combines plans from 11 states into one cohesive, rangewide plan that will guide the agency's conservation efforts. SGI 2.0 aligns with plans of local, state and federal partners, including plans by governors, the Bureau of Land Management and U.S. Forest Service. The four-year strategy enables NRCS to better position staff for implementation and provides time for partners to leverage additional funding for identified priorities



## CONSERVATION ACTION

### Threat: Fire and Invasive Annual Grasses

**Purpose and Need:** Wildfire poses a primary threat to habitat because of direct loss. Invasive grasses harm habitat by replacing critical habitat components and provide fuel for unwanted fire.

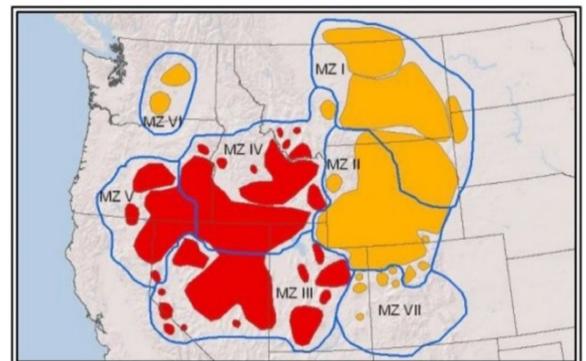
**Priority Areas:** Wildfire threat is in western portion of range. States include California, Idaho, Nevada, Oregon, Utah and Washington. Threat of invasive grasses extends east into Rocky Mountain states as an emerging issue in all management zones. Sage Grouse Management Zones III, IV, V and VI.

**Conservation Objective:** Reduce threats to annual grasses by grazing sustainably to promote deep rooted perennials, re-vegetating disturbed areas and combatting noxious weeds. Avoid further loss of sagebrush grazing lands to wildfire by reducing annual grass threat and by assisting in strategic fire break installation.

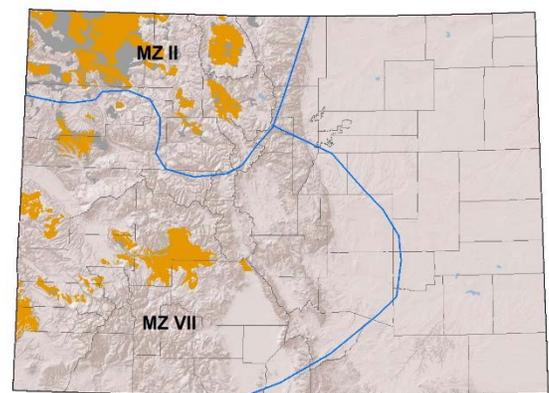
**Funding Source:** Environmental Quality Incentives Program (EQIP)

#### **SGI Targeting:**

Sage grouse habitats evolved with wildfire but the proliferation of invasive, non-native annual grasses has forever changed NRCS' approach to land management. Recent science shows that suppression is 98 percent effective, but the 2 percent of invasive grass that regrows continually increases in size and severity, impacting millions of acres annually (Trial by Fire; Murphy et al. 2013). Groundbreaking application of Resistance and Resilience (R&R) concepts to the sagebrush ecosystem combines the habitat needs of sage grouse with soils and climate data (Chambers et al. 2014). SGI uses resources from other agencies, like BLM, to better target sustainable grazing, weed management and re-vegetation efforts. BLM maps detail the agency's game plan for implementing the right actions in the right places before, during and after fires. BLM's prescriptions transcend property boundaries, enabling SGI to partner on implementation.



*Rangewide priority areas for addressing fire and invasive grass.*



*Colorado priority areas for addressing fire and invasive grass.*

**SGI Regional Outcomes:**

Since 2010, SGI has enhanced rangeland health to reduce threat of invasive grasses on 1.7 million acres. Prescribed grazing, implemented on 1.6 million acres, is the primary way that ranchers manage for deep-rooted perennial grasses whose prevalence is inversely related to that of invasive annual species. Descriptions of ecological sites and comprehensive rangeland inventories, coupled with prescribed grazing, provide the biological basis for sustainable grazing plans. Additional practices control invasive grasses and re-vegetate sites where invasives are removed.

**SGI 2.0 Refinement:**

SGI 2.0 will scale up threat reduction of invasive and annual grasses in seven states, assisting BLM on comingled private lands. This investment is 50 percent greater than in previous years. Forty percent more land will be seeded with native grasses, and 50 percent more prescribed grazing will be implemented. Meanwhile, managing weeds will grow 40-fold. SGI 2.0 marks the first time that an estimated 216 miles of carefully placed fuel breaks will be a part of the effort, which will improve rangeland health and resilience on about 2.2 million acres in priority areas.

Restoration and Enhancement				
State	Grazing Acres	Seeding Acres	Weed Management Acres	Fuel Breaks Feet
CA	7,000	0	600	550,000
CO	180,000	14,000	6,000	0
ID	285,000	4,500	10,000	0
NV	150,000	0	200	15,000
OR	300,000	21,000	42,500	550,000
UT	40,000	0	300	25,000
WY	900,000	100	145,000	0
Gunnison (CO)	60,000	5,000	6,600	0
<b>TOTAL</b>	<b>1,922,000</b>	<b>44,600</b>	<b>211,200</b>	<b>1,140,000</b>



*Photo courtesy of U.S Geological Survey.*



*Photo courtesy of Jaepil Cho.*



## CONSERVATION ACTION Threat: Invasive Conifers

**Purpose and Need:** Altered fire regimes have allowed conifers to expand into sagebrush ecosystems reducing available habitat. Sage grouse avoid areas where pinyon and juniper trees have expanded, causing the habitat to decline.

**Priority Areas:** Primarily Great Basin but localized in the other management zones and states. Primary states include California, Colorado, Idaho, Nevada, Oregon and Utah. In Colorado, high priority areas include portions of greater sage grouse units 5, 34, and 9e and Gunnison sage-grouse units 1, 2, 3, 4, and 5.

**Conservation Objective:** Accelerate removal of conifer trees and increase efforts in key regions.

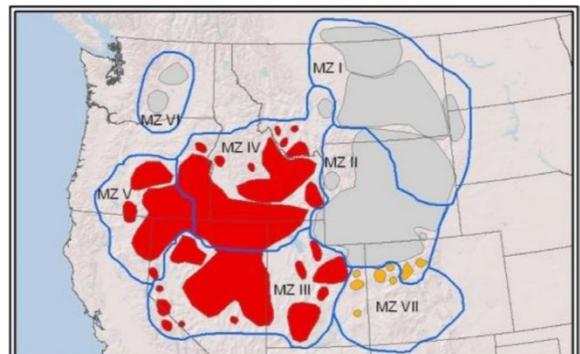
**Funding Source:** Environmental Quality Incentives Program (EQIP)

### **SGI Targeting:**

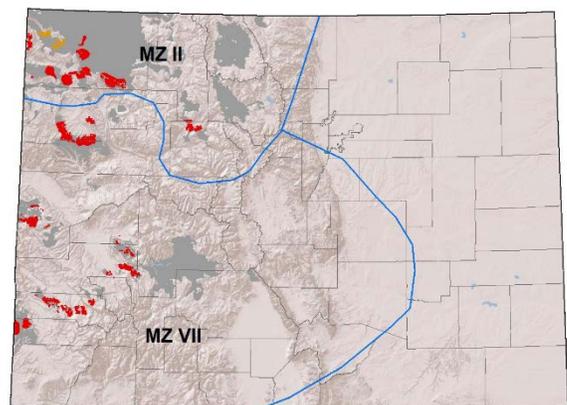
Scattered young trees may look harmless to a casual observer, but science shows that birds abandon otherwise suitable habitat with as little as 4 percent tree cover (Baruch-Mordo et al. 2013). SGI conifer removal maintains extant populations by removing early encroaching trees. Junipers and pinyon pines have expanded their range six-fold in western states since the 1800s. About 80 percent of sagebrush sites occupied by conifers are in early phases of invasion. SGI strategically removes a small percentage of this early encroachment in the right places to greatly benefit populations. Cuts inside of priority areas and near their edges also function to increase the amount of available habitat.

### **SGI Regional Outcomes:**

SGI cuts have reclaimed 405,241 acres of otherwise suitable habitat. Nearly half of reclaimed acres are in Oregon, where conifer removal during SGI has increased by 14 times over. Threat alleviation on private lands in Oregon is 68 percent complete inside of priority areas. Recent research by U.S. Geological Survey confirms that mechanical treatments



*Rangewide priority areas for addressing invasive conifers.*



*Colorado priority areas for addressing invasive conifers.*

benefiting sage grouse also increase sagebrush songbirds that reoccupy cut sites the spring following treatment. When conifers are removed, it also decreases the fuel available to potential wildfire.

**SGI 2.0 Refinement:**

Removing conifers at the landscape scale remains a core practice in SGI 2.0 with a projected 86 percent of new cuts targeted to priority areas in the Great Basin states of Oregon, California, Nevada, Idaho and Utah. New in 2015 are cuts within the Rocky Mountain states of Montana, Wyoming, Colorado and the Dakotas, where invasive conifer is a local threat. New conifer mapping to enhance targeting will be complete by September 2015 across 102.5 million acres of occupied habitat. SGI 2.0 will be partnering with state and federal entities to co-locate conifer cuts on public and private lands and track progress jointly to reduce threats.

**Anticipated Milestones by 2018:**

- Cuts in Oregon remove 95 percent of early succession conifer on private lands in focal areas, 90 percent of private lands in priority areas statewide, and 75 percent on private lands in occupied habitat statewide.
- On private lands in California, threat conifer will be completely removed within Klamath Basin population priority areas.
- Restore 25,773 acres in Utah representing 58 percent of non-federally encroached priority

Restoration and Enhancement Conifer Removal	
State	Acres
CA	20,000
CO	7,000
ID	10,800
MT	2,000
ND & SD	200
NV	14,000
OR	140,000
UT	26,000
WY	19,000
Bi-State (CA)	1,000
Bi-State (NV)	3,000
Gunnison (CO)	3,000
<b>Total</b>	<b>246,000</b>



NRCS photo



## CONSERVATION ACTION

### Threat: Exurban Development

**Purpose and Need:** Dispersed homes on small acreages result in direct habitat loss and fragmentation. Associated infrastructure and disturbance further exacerbate the impacts.

**Priority Areas:** Rangelwide but localized. Portions of each of the 11 sage grouse states except Washington. Sage Grouse Management Zones I-V, VII and Bi-State. In Colorado, priority areas include portions of greater sage grouse units 35, 5, 6 and 9e and Gunnison sage-grouse units 2, 1, 3, 4, and 5.

**Conservation Objective:** Limit urban and exurban development in sage grouse habitats by acquiring conservation easements that maintain intact native sagebrush plant communities.

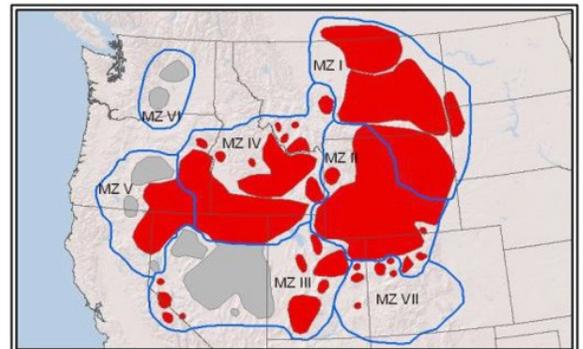
**Funding Source:** Agricultural Conservation Easement Program (ACEP)

#### **SGI Targeting:**

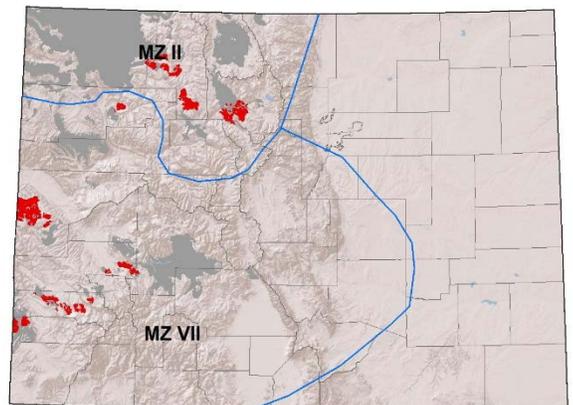
Conservation easements are an effective yet expensive mechanism for removing exurban development threat by keeping large working ranches intact. The localized nature of this threat means that comparatively few private lands are at elevated risk of development. SGI uses science-based targeting tools to strategically locate easements inside of priority areas where development potential is highest (Copeland et al. 2013, 2014). SGI clusters easements within at-risk watersheds.

#### **SGI Regional Outcomes:**

Conservation easement acreage has increased 18-fold during SGI of which 83 percent, or 375,345 acres, were targeted to combat subdivision. Conservation easements are more than four times larger inside occupied habitats than outside them. About 94 percent provide permanent protection. Outcome-based science shows Wyoming core area policy and easements reduce losses by two-thirds that would have occurred in priority areas. In southwestern Wyoming, protective measures put in place for sage grouse also conserve 75 percent of habitat for migratory mule deer. Easement acquisitions in northwestern Colorado stitched



*Rangelwide priority for addressing exurban development.*



*Colorado priority for addressing exurban development.*

together forever a quarter million-acre landscape containing the largest population of sage grouse and elk in the state. In central Idaho, SGI works with the Pioneer Alliance to conserve the connectivity of 2.4 million acres of public land by conserving 65,400 acres of privately owned ranchlands.

**SGI 2.0 Refinement:**

SGI remains committed to systematically complete ongoing easement campaigns to prevent exurban development inside priority areas in Idaho, Colorado and Wyoming. New campaigns and their locations are being launched in Oregon and Utah.

**Anticipated Milestones by 2018:**

- Idaho’s easement campaign in the Pioneer Mountains will be completed by 2018 with procurement of the final 40,000 acres identified.
- In Wyoming, an additional 105,000 acres by 2018 will meet 87 percent of SGI’s goal of \$250 million, with this campaign complete by 2020.

**Restoration and Enhancement Protection**

State	Easements Acres
CO	25,000
ID	40,000
OR	65,000
UT	35,000
WY	105,000
Gunnison (CO)	10,000
<b>Total</b>	<b>320,000</b>



*Photo courtesy of Jeremy R. Roberts*



## CONSERVATION ACTION

### Threat: Cultivation of Grazing Lands

**Purpose and Need:** Cultivation reduces native sagebrush grazing lands, fragments remaining habitat and favors predators that feed on sage grouse populations.

**Priority Areas:** Select portions of the range. States include Montana, North Dakota, South Dakota and Washington. Sage Grouse Management Zones I and VI. In Colorado, threat occurs in localized areas where conversion has been identified as a threat and where CRP/SAFE acres are expiring.

**Conservation Objective:** Avoid further loss of sagebrush grazing lands to cultivation by acquiring conservation easements that maintain native sagebrush grazing lands, and prioritize restoration of intervening croplands and graze livestock sustainably across these landscapes.

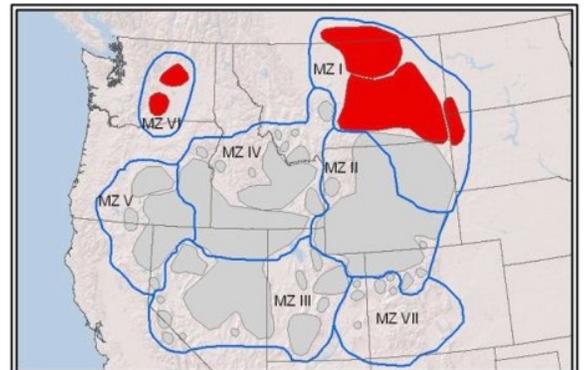
**Funding Sources:** Environmental Quality Incentives Program (EQIP) and Agricultural Conservation Easement Program (ACEP)

#### **SGI Targeting:**

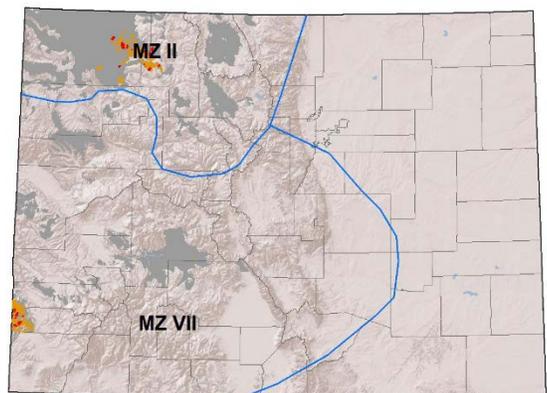
New SGI science assessing the scale at which cultivation impacts sage grouse found that one landowner converting a single square mile into new cropland negatively impacts birds in a landscape 12 times that size (Smith et al. 2015). They found that 96 percent of active leks today are surrounded by less than 15 percent of cropland. Maps resulting from this science are helping partners identify at-risk landscapes where conservation easements would reduce cultivation risk most efficiently. SGI also targets restoration efforts (where cultivation conversion has already occurred) surrounding leks.

#### **SGI Regional Outcomes:**

SGI science found conservation compliance provisions in the 2014 Farm Bill and a \$146 million investment in easements can reduce the bird losses by 87 percent that would have occurred without these conservation measures in place (Smith et al. 2015). Conservation compliance provisions in the 2014 Farm Bill discourage producers from converting native rangeland to cropland by reducing federal crop insurance, but the largest benefits are realized through easements.



*Rangewide priority areas for addressing cultivation of grazing lands.*



*Colorado priority areas for addressing cultivation of grazing lands.*

Easement acreage increased 18-fold during SGI of which 15 percent, or 65,881 acres, reduced cultivation risk. Located within the species' northernmost priority areas, SGI's largest easement helps maintain in perpetuity the longest-known sage grouse migration, a 150-mile journey between Saskatchewan and the Missouri River in northeast Montana (Tack et al. 2012, Smith et al. 2013).

In Management Zone VI, the decline of sage grouse has reversed following maturation of 1.5 million acres of Conservation Reserve Program (CRP) lands, planted through USDA's Farm Service Agency, to restore cropland to perennial grasses and sagebrush (Schroeder and Vander Haegan 2011). Today, SGI is helping maintain these habitats by turning expiring CRP lands into working lands where sustainable grazing is the predominant land use.

**SGI 2.0 Refinement:**

SGI is maintaining large and intact grazing lands by coupling restoration and enhancement with conservation easements. In addition to easements, SGI is implementing sustainable grazing systems, restoring old crop fields to native rangelands and removing predator subsidies. SGI is projected to acquire another 61,500 acres of easements as part of SGI 2.0. States and partners are using SGI's spatial planning tool to target easements to landscapes under highest threat of cultivation. Under a whole systems approach, SGI is also augmenting easement acquisitions with approximately 10,000 acres of restoration by reseeding old fields back to native bunchgrasses. In these intact grazing lands, Montana is piloting removal of rock piles, outbuildings, power poles, dumps and other human subsidies to reduce avian and mammalian predation on sage grouse (Dinkins et al. 2014).

**Anticipated Milestone by 2018:**

- Montana, North Dakota and South Dakota will complete a third of the \$146 million easement goal by 2018, a campaign that when complete in a decade, will reduce bird losses to cultivation by 87 percent.

Restoration and Enhancement Protection				
State	Easements Acres	Grazing Acres	Seeding Acres	Predator Subsidies ft2
MT	40,000	650,000	8,400	260,000
ND & SD	20,000	150,000	1,600	0
WA	1,500	50,000	0	0
CO	0	0	500	0
Gunnison (CO)	0	0	0	0
<b>Total</b>	<b>61,500</b>	<b>850,000</b>	<b>10,500</b>	<b>260,000</b>



Photo courtesy of Sage Grouse Initiative.



Photo courtesy of Sage Grouse Initiative.



## CONSERVATION ACTION

### Threat: Mesic Area Loss and Degradation

**Purpose and Need:** Loss and degradation of mesic habitats exacerbate declines in many populations because grouse rely on these areas for abundant forbs and insects to feed chicks in late summer. Impacts include direct drainage, down-cutting of channels, conversion to exurban uses and conifer expansion.

**Priority Areas:** Rangelandwide, locally in all Management Zones.

**Conservation Objective:** Avoid further loss of riparian edges, wet meadows, seasonal wetlands, and irrigated fields by acquiring conservation easements that maintain mesic habitats, and by restoration and enhancement of degraded mesic areas.

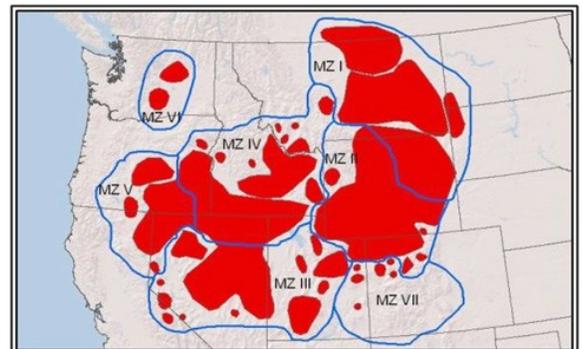
**Funding Source:** Environmental Quality Incentives Program (EQIP) and Agricultural Conservation Easement Program (ACEP)

#### **S GI Targeting:**

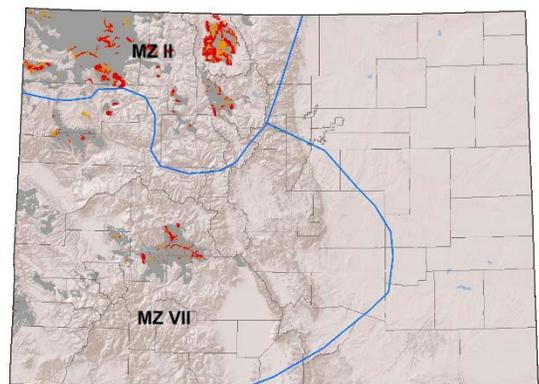
As upland nesting habitat typically dries in late summer, sage grouse follow the “green line” in search of productive wet habitats that provide food and cover for maturing young. New SGI science shows that 85 percent of leks are within six miles of mesic resources. The largest leks are within two miles of wet habitats. This is the first time science has shown that scarcity of wet habitats drive the location of grouse breeding sites on uplands as hens choose to mate and nest within a reasonable walk of where they can find late summer foraging for their broods. Wet habitats comprise less than 2 percent of the landscape, of which 80 percent are not federally owned, making private lands central to sage grouse conservation. Maps linking bird density to their mesic resources are helping partners in California, Nevada and Oregon identify the most important wetlands to focus restoration, enhancement and protection efforts (SGI 2014).

#### **S GI Regional Outcomes:**

Mesic habitats and associated brood survival is a limiting factor in Western sage steppe landscapes (Atimian et al. 2010, Blomberg et al. 2012). SGI's first large-scale attempt to conserve mesic



*Rangelandwide priority for addressing mesic area loss & degradation.*



*Colorado priority for addressing mesic area loss & degradation.*

areas for sage grouse resulted in 12,000 acres of conservation easements in the Bi-State region along the Nevada-California border. This action helped keep the FWS from listing the Bi-State population under the ESA by proactively maintaining these important mesic habitats. Across the 11-state range of greater sage-grouse, 179 acres were restored or enhanced to increase quality and amount of habitat.

**SGI 2.0 Refinement:**

SGI 2.0 is committed to completing easement acquisitions in the Bi-State region, and to expanding its easement portfolio to protect other important mesic habitats in northern Nevada and Utah. This move represents a 150 percent increase from previous years and maintains an estimated 13,000 acres of requisite habitats on working ranches in the Great Basin. Rather than simply acquire easements, SGI also provides uplift to populations by coupling protective measures with restoration and enhancement.

SGI 2.0 is expanding greatly to include mesic restoration and enhancement in 10 states totaling about 1,675 acres, which is eight times as many acres from previous years. When complete in 2015, states and partners will use rangewide SGI maps of mesic resources to further target these actions to maximize benefits (SGI 2014).

Restoration and Enhancement Protection		
State	Easement Acres	Mesic Area Enhancement Acres
CA	0	20
CO	0	130
ID	0	15
MT	0	60
NV	3,400	60
ND & SD	0	10
UT	400	690
WY	0	50
Bi-State (CA)	6,200	120
Bi-State (NV)	3,000	20
OR	0	500
<b>Total</b>	<b>13,000</b>	<b>1,675</b>



*Photo courtesy of Conservation Media.*



*Photo courtesy of Sage Grouse Initiative.*



## CONSERVATION ACTION Threat: Fence Collisions

**Purpose and Need:** Private working lands are the glue that maintain sage grouse habitats across the West. Despite habitat benefits from ranching to sage grouse, poorly placed fences may threaten birds with increased collision risk.

**Priority Areas:** Rangewide, locally in all Management Zones.

**Conservation Objective:** Reduce sage grouse fence collisions.

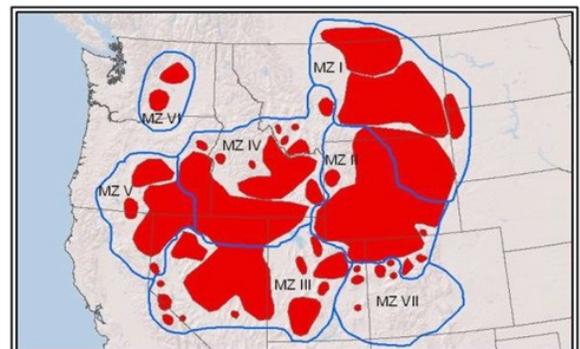
**Funding Source:** Environmental Quality Incentives Program (EQIP)

### **SGI Targeting:**

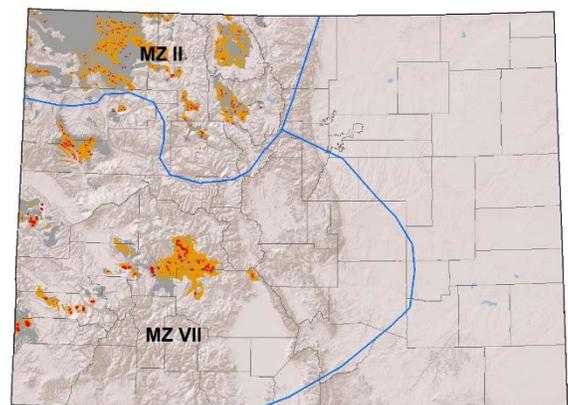
SGI science has catalyzed fence-marking by first quantifying its benefit and then targeting its application (Stevens et al. 2013). About 93 percent of collisions occur within one mile of breeding grounds in flat to rolling terrain. The simple practice of fence-marking reduces grouse collisions by 83 percent (Stevens et al. 2013). With this information in hand, SGI developed a mapping tool to help land managers identify areas where grouse are most at risk of colliding with fences. Mapping reveals that only 6 to 14 percent of sage grouse range poses a high risk for collisions. This tool helps managers avoid building new fences in high-risk areas and focuses limited resources to marking those fences most likely to reduce collisions.

### **SGI Regional Outcomes:**

Through direct contracts with landowners and our partnership efforts, SGI has reduced threat of collision by marking 590 miles of high-risk fence. About 79 percent of marked fences are located inside priority areas to reduce risk to the greatest number of birds. Published estimates report a 600 percent decline in collisions along marked versus unmarked fences (Stevens et al. 2010, 2011a, b). Using these rates, SGI's fence-marking efforts are preventing 2,600 fence collisions annually.



*Rangewide priority areas for addressing fence collisions.*



*Colorado priority areas for addressing fence collisions.*

**SGI 2.0 Refinement:**

SGI 2.0 builds on its past success and anticipates marking another 227 miles of high- risk fence in eight states, bringing this effort to nearly 817 miles.

**Anticipated Milestones by 2018:**

- Utah and Colorado will have marked or removed all high-risk fences on private lands inside priority areas by 2018.

Restoration and Enhancement	
State	Fence Marking Ft.
CO	60,000
ID	60,000
MT	550,000
OR	110,000
UT	130,000
WA	110,000
WY	100,000
Gunnison (CO)	80,000
<b>Total</b>	<b>1,200,000</b>



*Photo courtesy of Jeremy R. Roberts, Conservation Media.*

## References

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