"When you have a time when you're sitting back and thinking, and you're trying to go to sleep, and you're thinking what is really the best thing you'd like to see, I can see the desert. To me that's such starkness, that's such beauty. And there's no place in America that represents what I think is beauty more than this Basin and Range."

—Harry Reid

Welcomed, valued, and affirmed

You are welcome here.

Colorado State University

Safe Zone

Committed to being an ally

Filtering the story

- McCarthy et al. 2010, Tyack et al. 2010: Blainville's beaked whales temporarily move off-range in response to mid-frequency active sonar
- 14 March 2011, BBC *Earth News:* Beaked whales "scared" by Navy sonar

Moretti, D. 2012. Science on whales, submarines, and conservation meets the news. Conservation Biology 26:379–381.

Filtering the story

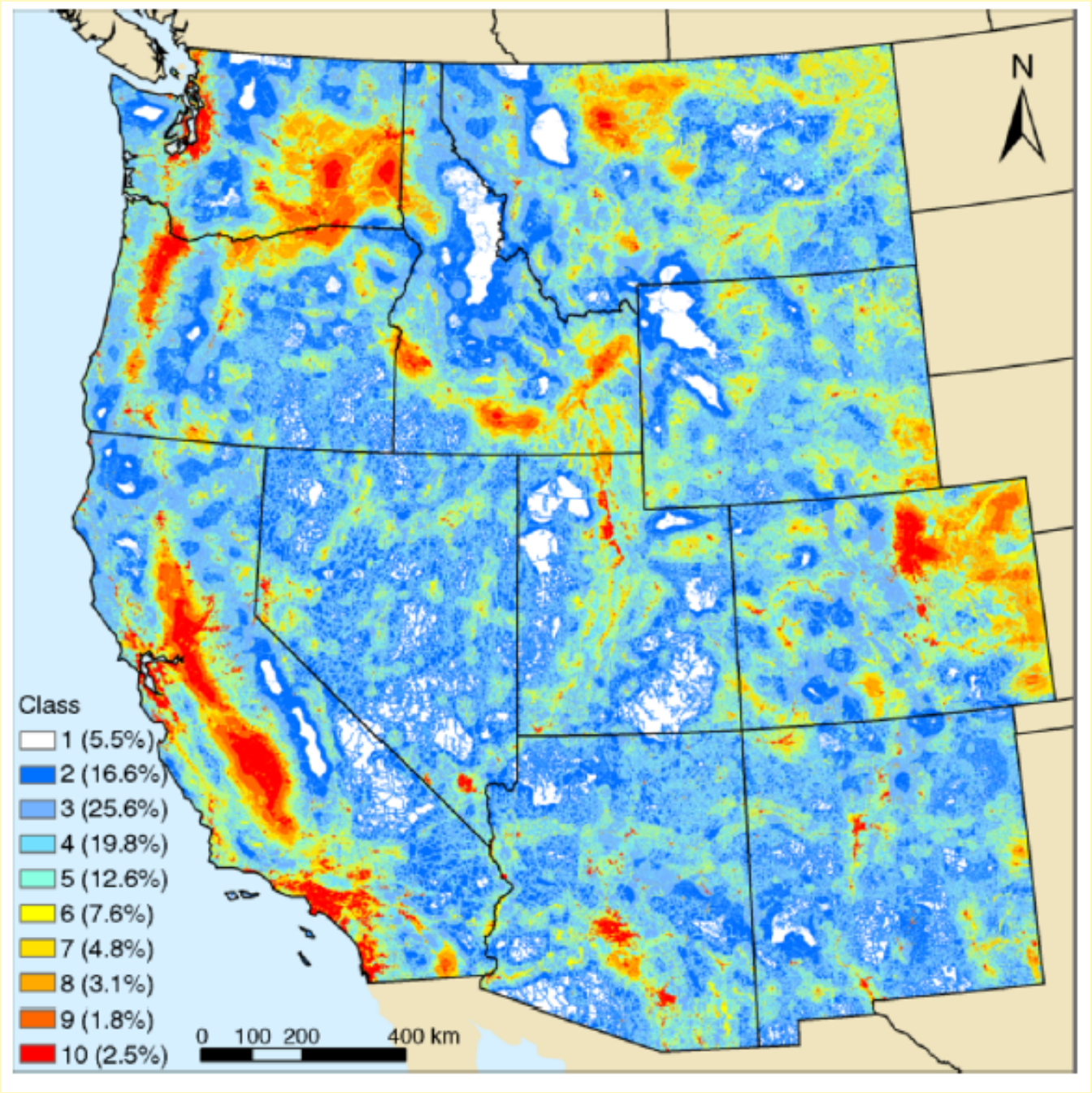
National Oceanic and Atmospheric Administration

- 15 March 2011, *Mail Online*: Sonar soundwaves "drive terrified whales to their death onshore"
- "Distressing: Researchers have found that sonar, wind turbines and gas and oil drilling can drive some beaked whales to come to the shore"

Filtering the story

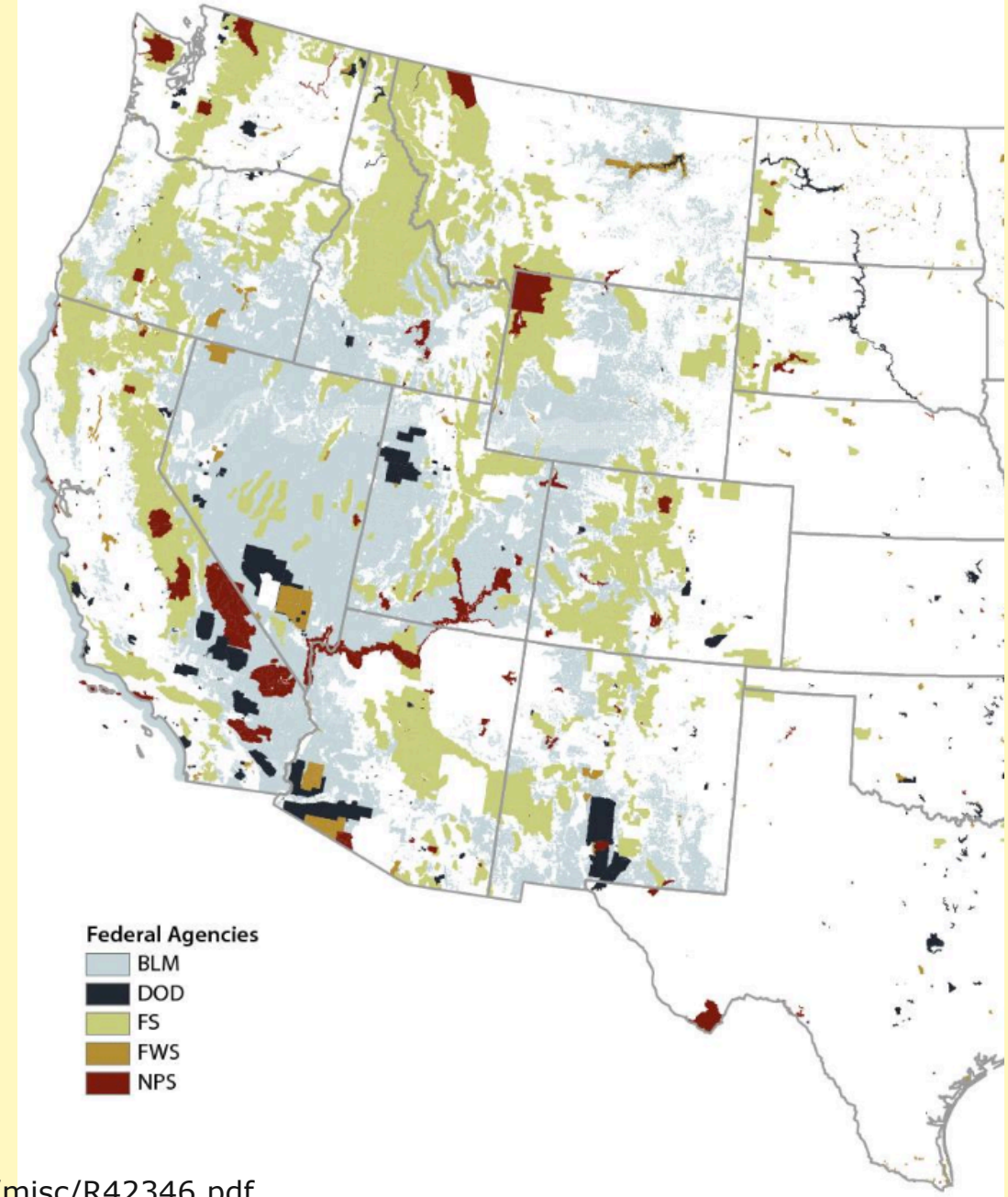
- 15 March 2011, *The Telegraph*: "Wind farms blamed for stranding of whales"
- 17 March 2011, *The Telegraph*: "Correction . . . [scientists said] there is no known direct link between those strandings and off-shore wind farms . . . a quotation . . . had been taken out of context"

US Geological Survey



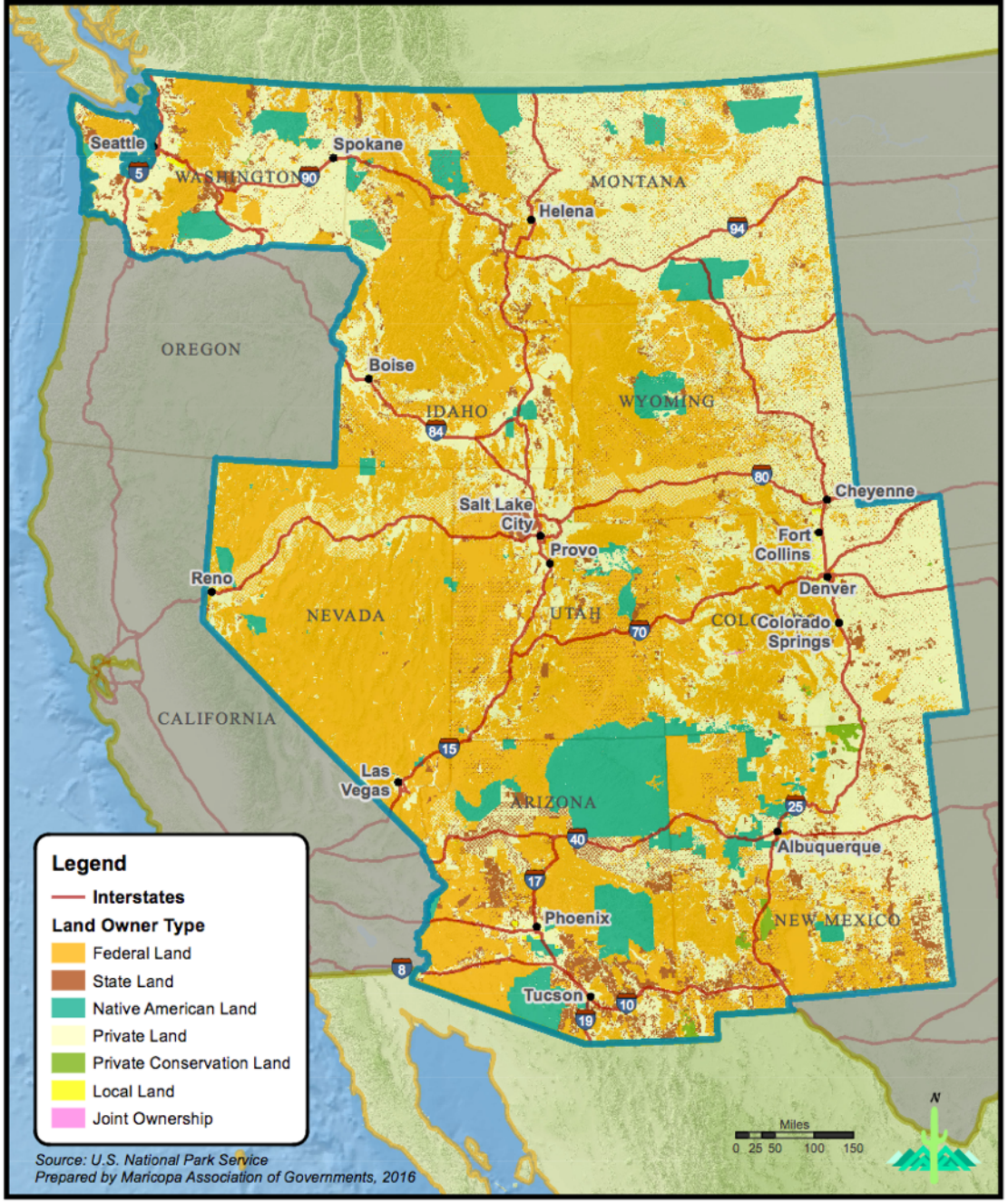
Leu et al. 2008


TOIYABE
National
Forest
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

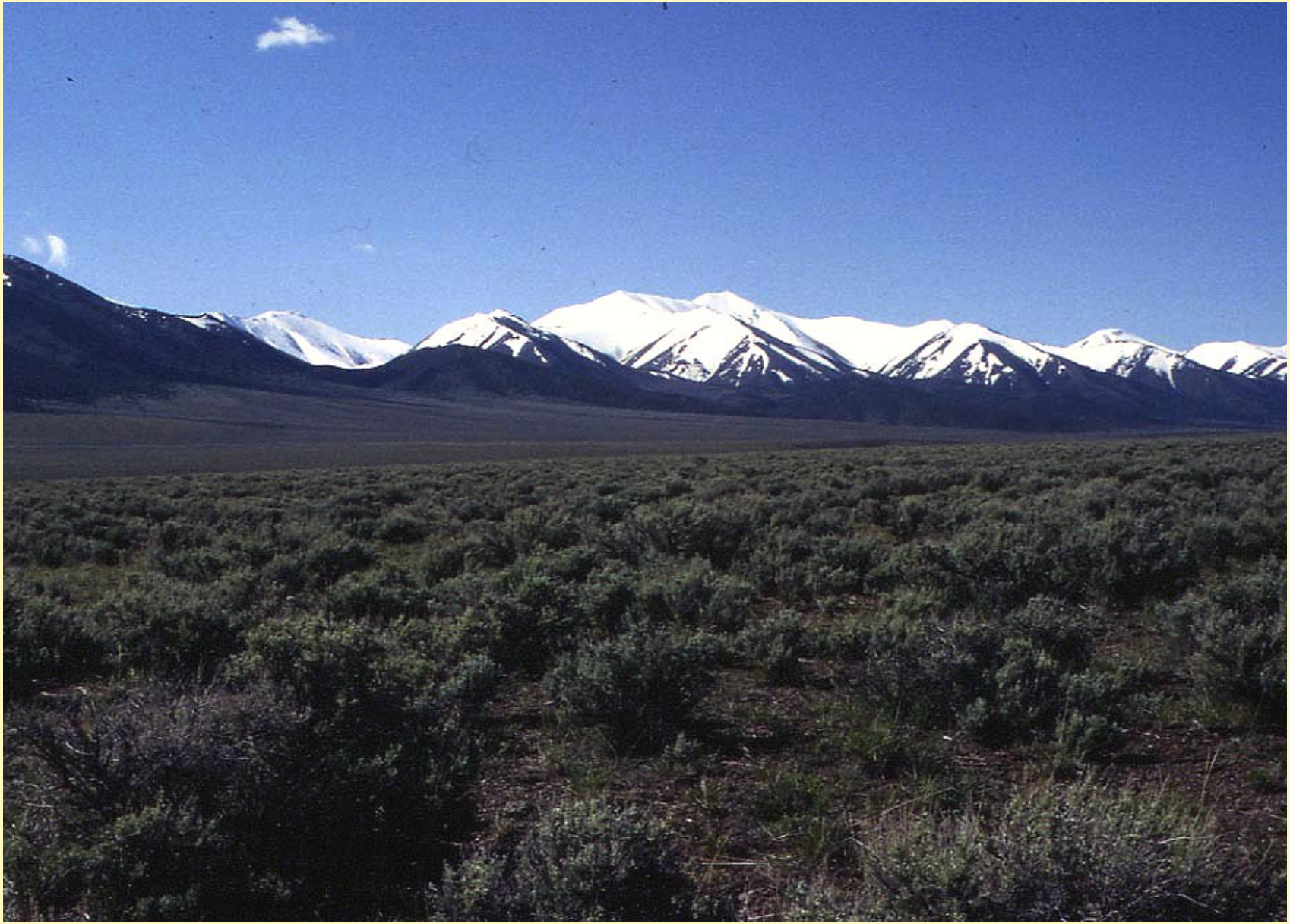


https://fas.org/sgp/crs/misc/R42346.pdf

Intermountain West
Land Ownership



Source: U.S. National Park Service
Prepared by Maricopa Association of Governments, 2016



David Pavlik

23 October 1995

Sagebrush Rebellion

The Sagebrush Rebellion has roots that go back to the early 1900s, when the federal government first started reserving public lands and developing water for early Western expansion. It took off starting in the 1970s, when the environmental movement pushed Congress to pass The Endangered Species Act, National Environmental Policy Act, Clean Air and Water acts, and others. It appeared again during the Clinton Administration, as it took on public land grazing, mining, and logging, while creating new controversial monuments under The Antiquities Act. Finally, the election of President Barack Obama brought on the latest iteration, with renewed calls for public land transfers to the states and rising anti-federal sentiment, such as that exhibited by the Malheur occupation.

High Country News

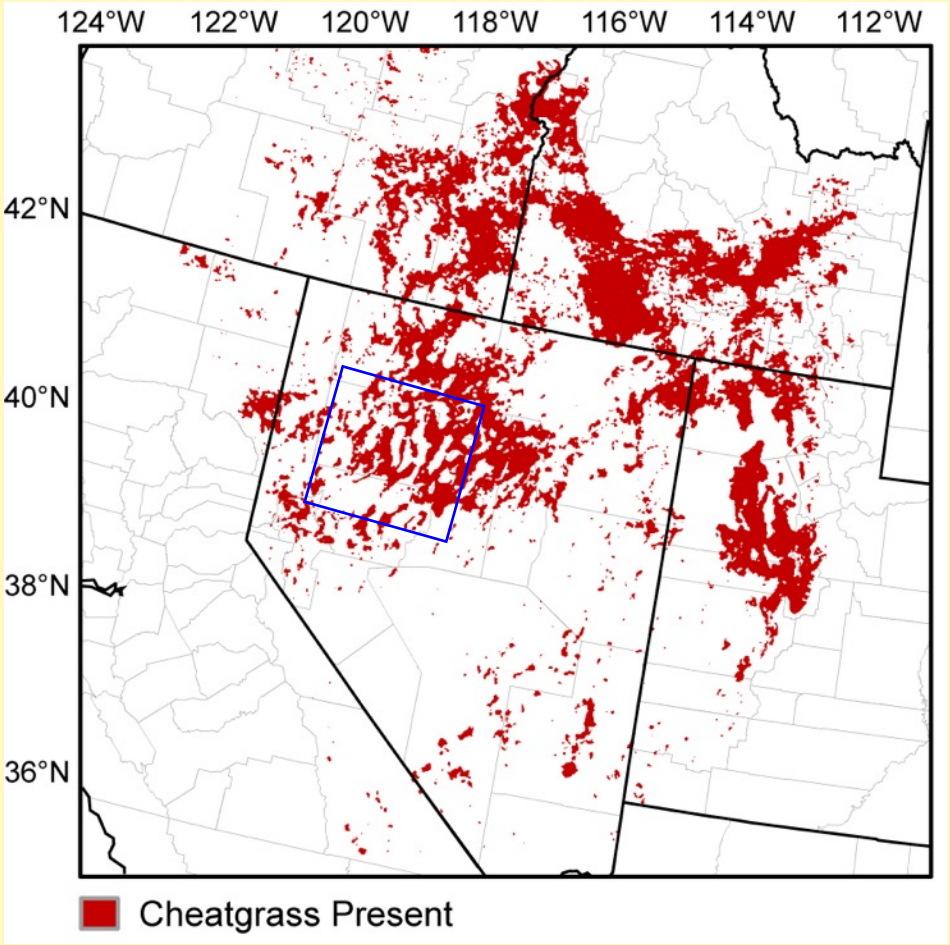
Non-native invasive species

native shadscale and bunchgrasses

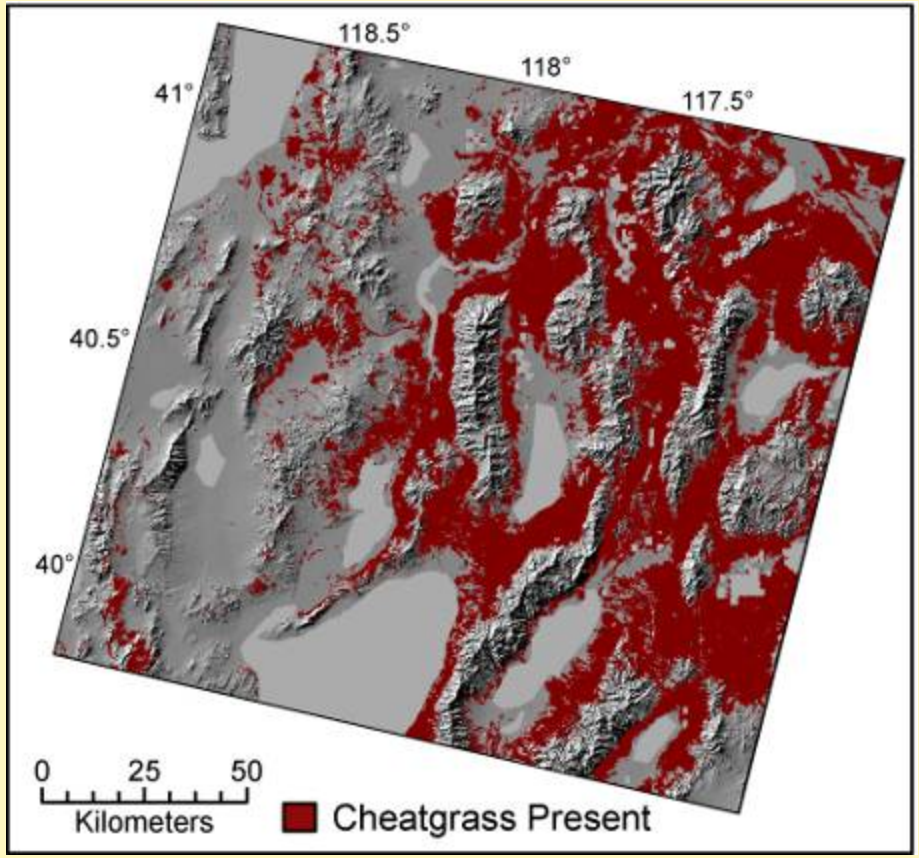
cheatgrass (*Bromus tectorum*)

Cheatgrass cover is ≥15% over 210,000 km^2 of the Intermountain West

AVHRR data



Landsat data

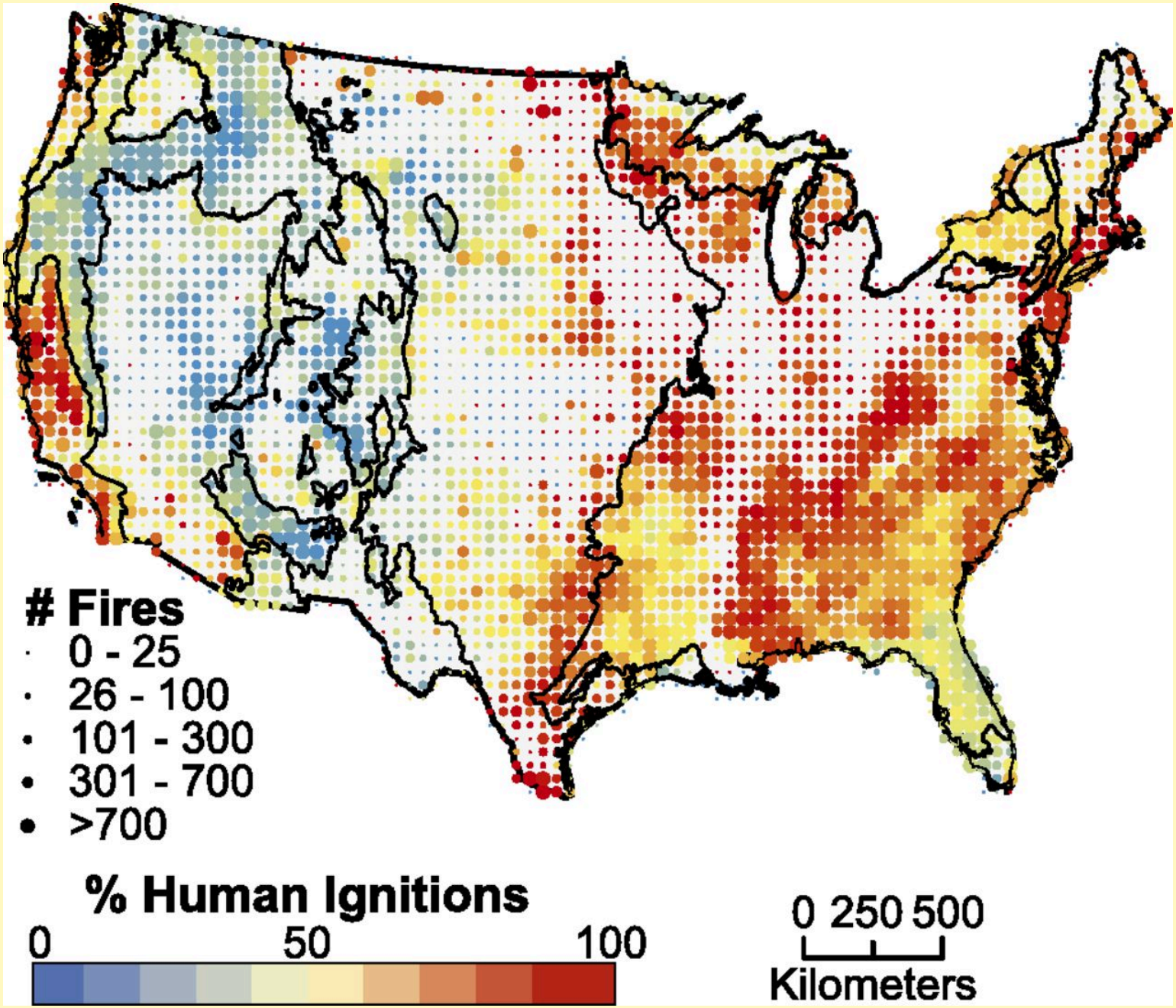


Bethany Bradley

Changes in fire dynamics

- Areas with high abundance were twice as likely to burn as those with low abundance
- Four times as likely to burn multiple times
- Fires occurred about 10 days earlier in areas with high abundance of cheatgrass
- Fire probability increased considerably at 1–5% cover

Bethany Bradley

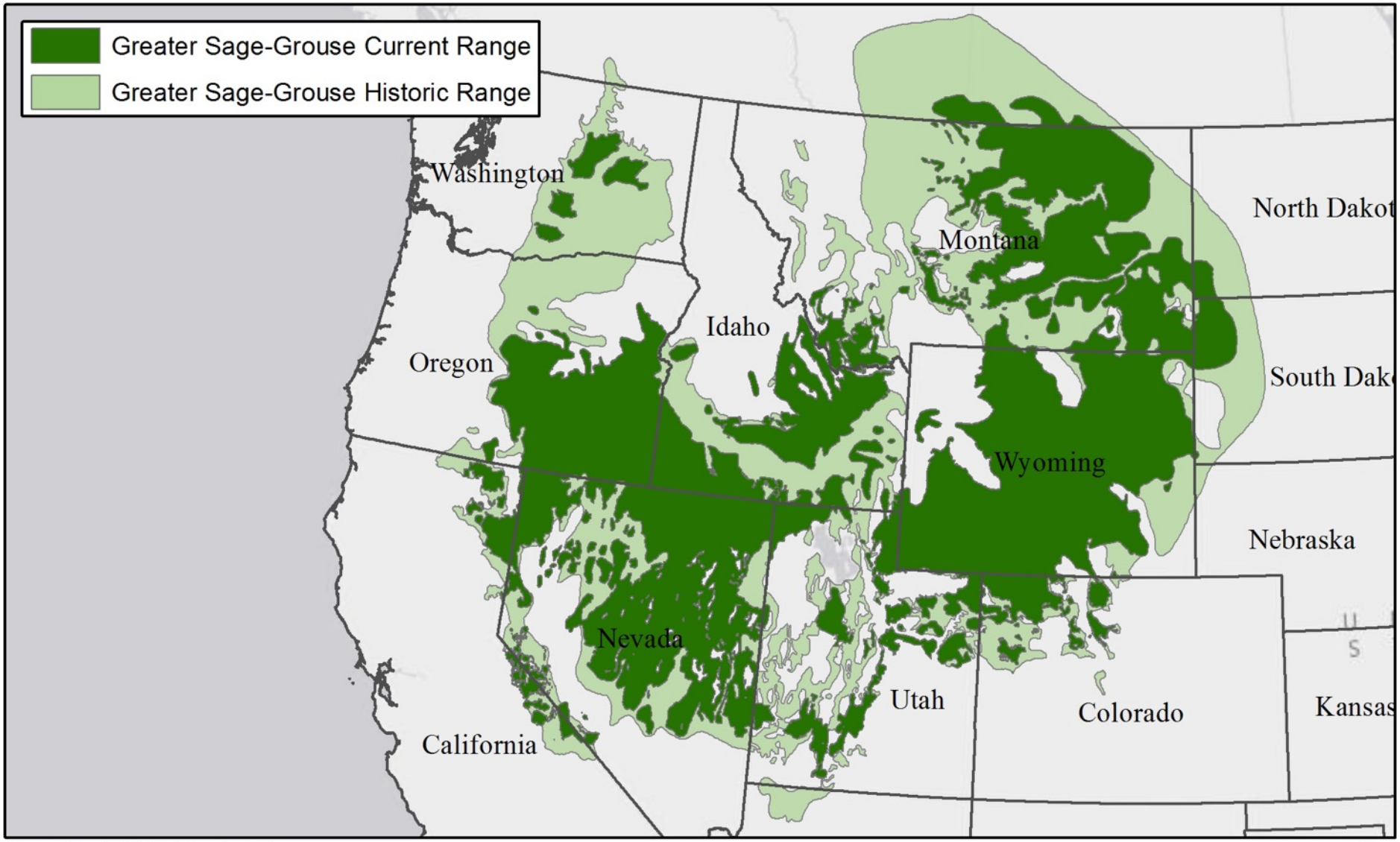


Balch et al. 2017

Greater Sage-Grouse (*Centrocercus urophasianus*)

U.S. Fish & Wildlife Service

Greater Sage-Grouse Range



Created By: US FWS, Wyoming ES
Map Date:8/15/2014
Source: FWS | COT (2013) | WAFWA | Schroeder et al. (2004) |
Base Map: Canvas/World Light Gray Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

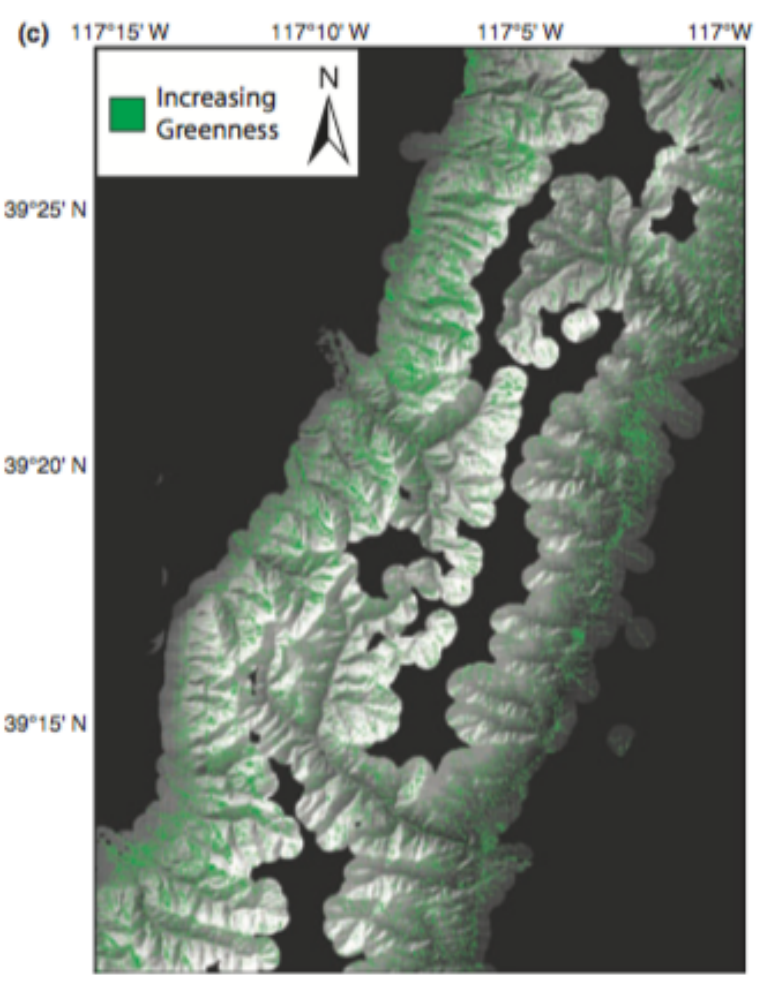
0 125 250 375 500 Miles
0 125 250 375 500 Kilometers

The USFWS makes no warranty for use of this map. Original data were compiled from various sources. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

Datum: NAD 83

Expansion of pinyon and juniper woodland

Conifer expansion 1986–2005



- Expansion and contraction throughout paleoecological record
- Slightly higher average precipitation
- Localized timber harvest
- Livestock grazing
- South-facing slopes: longer growing season and sunlight exposure
- Increased atmospheric CO_2

- Conventional dogma: "sage grouse hate trees"
- Greater Sage-Grouse can move through, feed, and nest near conifers
- 20–75 years for reestablishment of habitat structure after disturbance
- Many other species are associated with conifers
- Removal of conifers can lead to expansion of cheatgrass

David Pavlik

"Launched by the US Department of Agriculture's Natural Resources Conservation Service in 2010 as a highly targeted and science-based landscape approach to proactively conserve sage-grouse and sustain the working rangelands that support western ranching economies [with the vision of] achieving wildlife conservation through sustainable ranching."


GOOD FOR
THE BIRD
GOOD FOR
THE HERD

USDA
Natural Resources Conservation Service

HEALTHY SAGEBRUSH COMMUNITIES

THE SAGE GROUSE IS AN UMBRELLA SPECIES

Studies have shown that conservation efforts for sage grouse also help **350** other species of plants, invertebrates, amphibians, reptiles, birds and mammals inhabiting the sagebrush sea, like mule deer and songbirds.

MULE DEER

Conservation measures set in place for sage grouse significantly increase the protection for mule deer migration and winter habitat.

SONGBIRDS

Songbirds like the Brewer's sparrow, sagebrush sparrow and sage thrasher are **13-fit** more abundant near large leks, which support half of all sage grouse populations.

MESIC MEADOWS

Wet "mesic" habitat, or places where water meets land comprise less than **2%** of the entire landscape in the West. Protecting and restoring these "emerald islands" in the desert benefits livestock ranching and wildlife, including sage grouse.

EASEMENTS

Easements protect large working lands from subdivision development in sage grouse core areas by using voluntary agreements that provide a financial boost for ranchers and preserve habitat.

FENCE MARKING

Sage grouse can collide with livestock fences when flying low over sagebrush. When grouse fly into their breeding grounds, or "leks," the dim predawn light makes it difficult to avoid fence wires. By placing markers on fence wires, ranchers are doing their part to reduce the potential for fence collision by **83%**.

PRESCRIBED GRAZING

Sage grouse eat different things depending on their age and the season. Rest-rotation grazing boosts the abundance of anthropods, like spiders and butterflies, a key part of the sage grouse diet in spring and summer, particularly for growing chicks. Rested or deferred pastures from grazing host the most anthropods important for nutrition.

THREATS

Conifer Encroachment

Sage grouse breeding habitat is lost to invading junipers when trees exceed **9%** canopy cover. Focused tree removal prevents conversion of sagebrush steppe to conifer woodlands and benefits sage grouse populations.

Benefits of conifer control

1. Maintaining native understory plants.
2. Reducing risk of large and severe wildfires.
3. Improving habitat for declining species.
4. Reducing soil erosion and conserving soil water.
5. Increasing ecosystem resilience to fire and resistance to cheatgrass.

Did you know that trees catch the snow?

Removing encroaching conifer stands from sagebrush ecosystems helps keep snow on the ground longer during the spring. This allows water to seep slowly into the ground to better sustain plants, streams, and wildlife during the West's hot, dry summer.

THREATS

Raptors

Conifers provide perches for predators.

Invasive Grasses

The spread of invasive annual grasses, like cheatgrass and medusahead, are linked to unwanted wildfires. Invasive grasses are highly flammable and dry out earlier than native plants, leading to more frequent, hotter fires. Once sagebrush habitat burns in a megafire, it's hard to restore, leaving noxious weeds that degrade rangelands and wildlife habitat.

These invasive grasses replace the sagebrush sea's diverse, native plants — like sagebrush, wildflowers, and bunchgrasses — with a monoculture of weeds. That's bad for birds and herds, which rely on nutritious, native perennial plants.

Solution

Conservation on working western landscapes restores sagebrush communities where sage grouse and other wildlife share the same extensive home range, and helps ranchers pass on their legacy and rural way of life.

HEALTHY WILDLIFE

HEALTHY RANGE

HEALTHY SOIL

WORKING LANDS FOR WILDLIFE

SAGE GROUSE INITIATIVE

nrcs.usda.gov/wildlife
sagegrouseinitiative.com

The Sage Grouse Initiative is a partnership-based, science-driven effort that uses voluntary incentives to proactively conserve America's western rangelands, wildlife, and rural way of life. This initiative is part of Working Lands For Wildlife, which is led by USDA's Natural Resources Conservation Service.

- "Spatial overlap between habitats of target species and those associated with sage-grouse was low (mean ψ = 0.23)" (Rowland et al. 2006)
- "The overlap of the umbrella was primarily a function of the broad range of sagebrush habitats used by sage-grouse" (Hanser and Knick 2011)

New Study Shows Sagebrush Restoration Helped Songbirds

The following article is written by Phil Taylor, E&E reporter, and republished with permission.

September 9, 2015 - Efforts to remove juniper trees in southern Oregon to make room for the greater sage grouse have already benefited a pair of sensitive songbirds that share the grouse's sagebrush habitat, according to a new study.

In the Warner Mountains, the abundance of Brewer's sparrows, whose plain-brown plumages belie the diversity of their trills and songs, increased by 55 percent after junipers were culled from the landscape, according to the **study** shared with *Greenwire*.

The abundance of green-tailed towhees, which sport a rust-brown head and bright tail feathers, increased by 81 percent following the cuts, researchers found.

The results suggest that restoring the sage-steppe ecosystem for sage grouse can yield benefits for a host of other sagebrush-dependent species, namely songbirds, researchers said.

"Threat reduction has been the focus of sage-steppe conservation, but for the first time with data we can show that conifer removal actually results in more birds," said Dave

Fallacies in reporting

David Pavlik

- Positive responses of two species and negative response of one species: “benefits for a host of other sagebrush-dependent species”
- “The study has been submitted”
- “Once juniper trees establish a woodland, they completely overtake native bunch grasses and sagebrush”
- “. . . conifer removals are a good idea except in old-growth juniper stands or areas where woodlands have historically occurred”
- “It's really hard to turn a forest back into a native rangeland”

USGS
science for a changing world

Prepared in cooperation with the U.S. Forest Service

A Conservation Paradox in the Great Basin—Altering Sagebrush Landscapes with Fuel Breaks to Reduce Habitat Loss from Wildfire

Open-File Report 2018-1034

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

Marketing versus science

- Thousands of km of fuel breaks are intended to reduce likelihood of wildfire risk
- Will lead to loss and fragmentation of habitat for numerous species
- Little is known about effects of fuel breaks on fire behavior or on native plants and animals
- "Implementation of fuel break systems . . . is a grand experiment that is not feasible for researchers to replicate or emulate at the appropriate scales"

David Pavlik