



State of the Sagebrush Sea in Harney County

In the Harney Basin, the health of the sagebrush steppe is of vital importance.

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By Scott Barton

Of the vast, wide-open spaces that characterize much of the American West, some 165 million acres are covered in sagebrush. Though seemingly open and empty to the naked eye, these lands are teeming with life. Pronghorn, deer, elk, sage-grouse, pygmy rabbits, and countless other species rely on the sagebrush biome for food and shelter.



However, sagebrush ecosystems are some of the most delicate in North America. They are also becoming increasingly threatened for reasons ranging from expanding conifer (like juniper) populations, invasive annual grasses and wildfire. According to Chad Boyd, Rangeland Ecologist and Research Leader for the United States Department of Agriculture and Agriculture Research Service, over 1.3 million acres of sagebrush habitat conditions degrade each year. Additionally, more than 350 sagebrush-associated plants and animals have been designated as species of concern.

Pictured: Sagebrush rangeland in southeast Oregon with the Pueblo Mountains beyond.

In the Harney Basin, the health of the sagebrush steppe is of vital importance not just to wildlife species, but residents, landowners, and outdoor enthusiasts that rely on these sprawling lands for their livelihood, recreation, and enjoyment.

Current Threats to Sagebrush Ecosystems in the Harney Basin

The Harney Basin landscape has been drastically altered since Peter Skene Ogden was the first European to arrive with a party from the Hudson's Bay Company in 1826. The introduction of livestock and modern agriculture, increased human presence, changes in wildfire cycles, and the encroachment of certain vegetation species have all been contributing factors.

Present day, Boyd says, "there are three major factors that pose greatest threats to the sagebrush rangeland in the Harney Basin. They include conifer encroachment (specifically western juniper), increased presence of invasive annual grasses, and wildfire."

Conifer encroachment has proven detrimental to sagebrush, most notably at higher elevations. This is largely due to a decrease in fire frequency at higher elevations; fire having historically kept coniferous communities in check and allowed sagebrush to flourish. Boyd says that "the majority of the current area of these woodlands were sagebrush plant communities prior to European arrival." He adds that "wildlife species are affected by conifer encroachment too. Greater

sage-grouse populations will completely stop using sagebrush communities once they achieve only four percent conifer coverage.”

Conversely, at lower elevations, an increase in fire frequency has allowed invasive annual grasses to take over regions where sagebrush thrived historically. Invasive annual grasses prove troublesome for sagebrush communities because they increase the frequency of fire. This makes it difficult for sagebrush to reestablish and is detrimental to native perennial grasses.

In some cases, there has been an overlap of both conifer and invasive annual grass encroachment. Sagebrush communities where this occurs are especially threatened.

There's Still Time

While the threats to sagebrush ecosystems are present and alarming, Boyd remains hopeful for the future. “We’re actively realizing these are problems we can rally around. Furthermore, thanks to technological advances in the last five years, we’re now able to easily and quickly analyze rangeland evolution going back to 1988.” Having the ability to analyze changes in the land helps to inform sound conservation and land management going forward.

Sagebrush Conservation Efforts in Harney County

“Historically, sagebrush ecosystem conservation efforts have often been focused on a single species,” according to Boyd. “We’ve come to realize that single species conservation efforts didn’t always account for greater ecosystem-wide problems that were the underlying cause of species decline.” Going forward, conservation efforts will focus on comprehensive sagebrush ecosystems rather than just a single species. In turn, the hope is that they will prove beneficial for all species within. To that end, there are already concerted efforts being made in the Harney Basin to improve the overall health of sagebrush ecosystems.

Conifer Tree Removal



There are two ways in which conifer encroachment is currently being dealt with in the sagebrush ecosystems of Harney County, cutting, and burning. In areas where juniper trees have been removed, more resilient, fire-resistant landscapes are beginning to take hold. Just as juniper encroachment quickly pushes out native species, juniper removal creates room for them to take hold once again. Cutting stands of invasive conifers, like juniper, has proven an effective method toward helping restore sagebrush ecosystems for a period of time.

Pictured: Juniper piling following cutting on private property as part of the Harney County Wildfire Collaborative's Southeast Oregon Wildfire Resiliency project that is removing

thousands of acres of juniper to increase native perennial plants and in the long term facilitate the return of sagebrush habitat.

Invasive Annual Grass Treatment

The treatment of invasive annual grasses in sagebrush communities has proven a tricky proposition throughout the Harney Basin, according to Boyd, but tangible progress is being made. So far, the most effective method has been the application of



herbicide that prevents invasive annual grass seeds from emerging. In most cases, herbicide can be applied to areas where perennial bunchgrasses are present.

The second step in the process is the reseeding of perennial bunchgrasses, which, once established, can effectively compete with invasive annuals that are healthy for sagebrush ecosystems.

Currently, The Nature Conservancy is working with the Agriculture Research Service to develop seed coating technologies to make this a one-step process where invasive grasses are treated with pre-emergent herbicide, and perennial seeds are introduced at the same time. Field testing is well underway, and there's hope that this can be applied at scale in the future.

To dive deeper into the issue of invasive annual grasses in sagebrush rangelands check out a special peer-reviewed issue of [Rangelands](#) journal. Following an Invasive Annual Grass Workshop in 2020, the authors in this Rangelands special issue came together with their

respective research and management perspectives to provide a comprehensive picture for effectively coordinating and collaborating in managing invasive annual grasses at a landscape scale.

Wildfire Prevention

One need not look too far back to recall the likes of the Long Draw(2012), Miller Homestead(2012), Holloway(2012) and Buzzard Complex(2014) fires that burned thousands of acres of sagebrush in the Harney Basin.

Today, state, federal, and local conservation groups like the Harney County Wildfire Collaborative, are working diligently to make the sagebrush steppe more resistant to wildfire, while also working to prevent their spread once they start. Much of the ongoing work is focused on managing fine fuel loads. "There is ample room for fine fuel management techniques to help create fuel conditions that position suppression efforts for success," says Boyd.

Throughout the sagebrush steppe, crews are working to build strategic fuel breaks that allow firefighters safe and ready access to potential burn areas in the event that a fire starts. Fine fuel maintenance along the edges of these fuel breaks has also been a top priority. Multiple partners are also working through the Harney County Wildfire Collaborative to establish a network of Potential Control Locations (PCLs). PCLs are corridors from which wildfires can be safely and effectively managed to help stop the next large wildfire. During wildfires, fire responders use existing or create new control lines to deploy firefighting resources, perform direct and indirect attack, and make tactical decisions. Location of control lines in an area may consist of roads, ridgetops, water bodies, edges of fire scars, or other topographical features. PCLs can help promote safe and effective fire response.

Conservation Efforts on Public and Private Land

Conifer tree removal, invasive annual grass treatments and building wildfire resilient landscapes are conservation efforts that are happening on public and private land. In addition, on private land and federal leased allotments cattle ranchers are actively practicing responsible grazing methods, as they have for generations. Pasture rotation, letting areas rest from grazing, and altering the time of grazing all help to ensure the health of sagebrush communities and the species that call them home.

Landowners are also working closely with state and federal ecologists and biologists to address conifer encroachment, invasive annual grasses, and wildfire threats on their land.

Additionally, many landowners in Harney County have signed up for the Harney County Greater Sage-Grouse Candidate Conservation Agreement with Assurances (CCAA) program. These agreements have the U.S. Fish and Wildlife Service and local Soil and Water Conservation Districts working with landowners to enhance habitat and ecological conditions for species that are currently considered candidates for listing under provisions of the Endangered Species Act.

Going Forward

Across the Intermountain West, the once vast sagebrush landscape is disappearing at an alarming rate. The causes are varied and complex, and both humans and wildlife are feeling the effects. Citizens of the Harney Basin have a front row seat.

However, the good news is that substantial efforts are being made to save these ecosystems. Through mitigation and removal of invasive vegetative species, wildfire prevention actions, and responsible use of the land by landowners and common citizens alike, there's hope for the future.

This article is provided by High Desert Partnership; a Harney County nonprofit convening and supporting six collaboratives including the Harney County Wildlife Collaborative.

