Species of the Sagebrush Sea

A harsh yet vulnerable place that is home to a diverse species of mammals, reptiles and birds.

March 2023
By Scott Barton

When you come to a stoplight in the middle of Burns, Oregon, highway 20/395 takes you north and east toward Ontario and Boise. The same highway leads you across the high desert to the west toward Bend. Highway 205 traverses south through some of the most remote country in the western U.S. toward the Nevada border. And Highway 78 routes south and east through vast expanses of open range.

No matter which direction one heads when leaving Burns, their travels take them through high desert and sagebrush steppe. This ecosystem is the largest ecosystem in the state, stretching from just east of Bend to the Idaho border and south from the Columbia River to the Nevada line. Across that range in Oregon, sagebrush dominates a number of different soils, topographic positions and elevation, but overall it occupies the driest locations. Average precipitation is less than 12 inches and even below 6 inches in the driest places. That is less than 6th of the rainfall in Portland. The landscape appears dry and inhospitable, but it is home for many plants and animals that have adapted to this environment. An ecosystem of this size has many unique characteristics from place to place. However, there are also characteristics that span larger portions of the ecosystem. In the sagebrush steppe recovery from disturbance, like wildfire, can take a long time, especially in the drier locations. Introduction of invasive annual grasses has further complicated the recovery and impacted the health of the sagebrush steppe and the wildlife populations.

A Harsh Yet Vulnerable Place

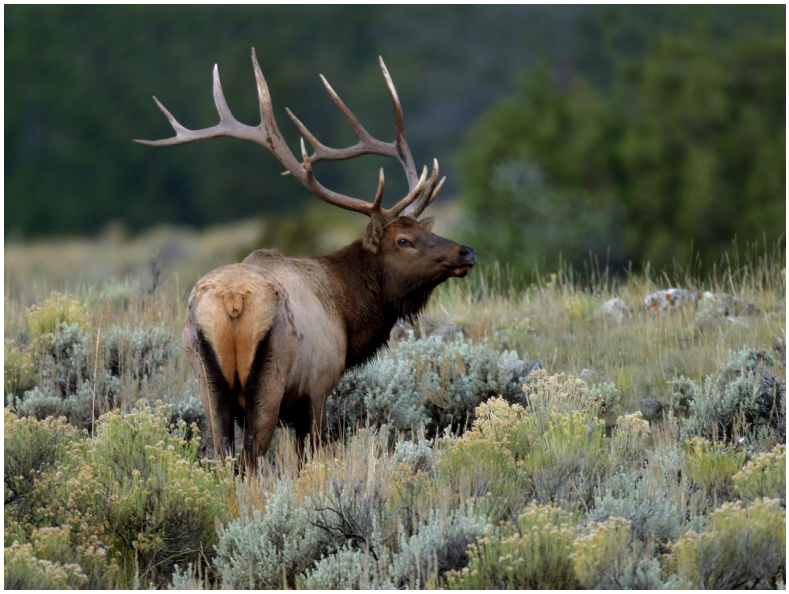
Perhaps more than any other climate in the lower 48 states, the sagebrush steppe experiences extremes in weather. In the summer, these landscapes witness temperatures that are hot and dry, with temperatures often reaching north of 100 degrees Fahrenheit. Conversely, winter often proves bitterly cold and harsh. As dramatic as temperature swings can be here, the sagebrush steppe remains a vulnerable ecosystem, and one that's slow to recover once it's been disturbed.

Brandon Palmer, Wildlife Program Manager for the Burns Paiute Tribe, says "the sagebrush steppe is fragile because the landscape contains high levels of variability in soils, vegetation, and production. This is a dry, arid landscape that is susceptible to extreme drought and is not very productive, often hampering restoration efforts."

Skyler Vold, Sage Grouse Conservation Coordinator for the Oregon Department of Fish and Wildlife, adds that "This ecosystem evolved with fire on the landscape, but likely not at the catastrophic scale that we have seen over the past 10 to 20 years. Depending on the species of sagebrush, these habitats can take from 50 to 250 years to reestablish following intense fire."

Invasive annual grasses also hamper the recovery of sagebrush steppe in the aftermath of wildfire. Vold points out that "invasive annual grasses have become established throughout much of this ecosystem, and they often outcompete native grasses and thrive following these megafires."

This begs the question, what has the impact been on the wildlife species that call the sagebrush steppe of the Harney Basin home?



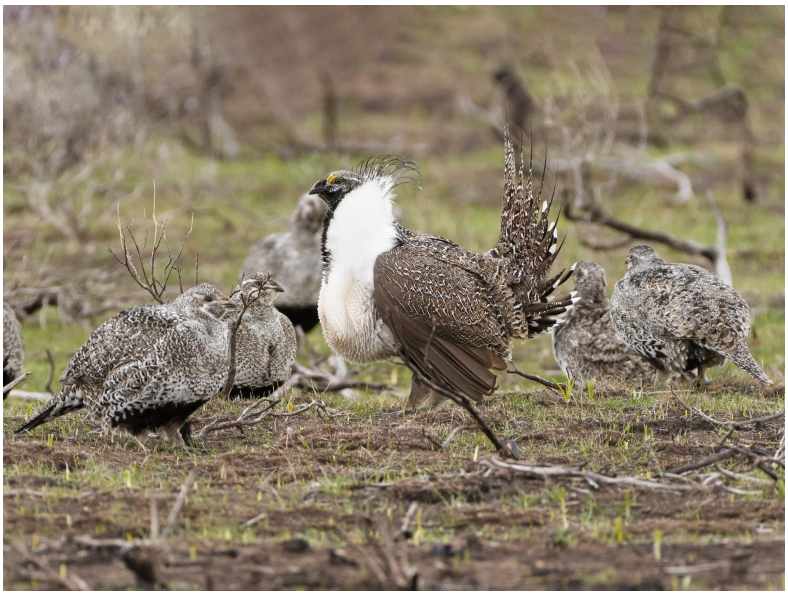
Species of the Sagebrush Seas

The sagebrush steppe is home to an array of diverse wildlife species including mule deer, rocky mountain elk, pronghorn, pygmy rabbits, dozens of raptor and songbird species, and reptiles. All these animals rely on the land and its vegetation for food, cover, and habitat.

Pictured: Rocky Mountain Elk by Terry Steele Photography

Mule deer, pronghorn, and elk are the largest mammal species found on the sagebrush steppe. All three species inhabit seasonal ranges they rely on for food, habitat, and breeding. In the summer months when forage is plentiful, these species inhabit higher elevations where temperatures are cooler and forage is plentiful. However, as temperatures cool in the fall and winter, they often migrate to lower elevations where there's less snow and food and suitable habitat are more readily available.

The species that provides the most telling glimpse into overall wildlife health and populations is the Greater sage grouse. Vold says "sage grouse are an obligate species which means they require intact sagebrush habitats for their entire lifecycle. Sage grouse are considered both an umbrella species and an indicator species for the sagebrush steppe ecosystem, as declines in their populations can reflect the general health of this landscape as a whole."



Alex Dohman, the Sage Grouse Local Implementation Team Coordinator for Pheasants Forever, indicates that "During the winter months, sage grouse generally move to winter grounds where snow impacts are not as severe at higher elevations. At this time the birds can exclusively feed off the leaves of sagebrush plants."

Pictured: Greater sage grouse, photo by ebird.org.

"In the spring sage grouse seek out specific locations around their lekking sites. Leks are locations where the birds conjugate in open areas within the sagebrush steppe and male sage grouse display for females during the mating season. Nesting sites by the females are selected, and generally have good sagebrush cover to hide from predation."

At this time of year, sage grouse chicks feed heavily on forbs and insects that are high in protein. These spring months are critical for chick survival as food sources are at their highest levels. However, in years of low snowfall, drought, or in the aftermath of wildfire, these food sources can be limited. Such is often reflected in both sage grouse and other wildlife populations.

How Does Wildfire Affect Wildlife Populations?

Wildfire in Harney County is a reality that both humans and wildlife contend with, especially in the last couple of decades. One need not look too far in the past to recall catastrophic wildfire events like the Long Draw, Miller Homestead, and Buzzard Complex wildfires which cumulatively scorched hundreds of thousands of acres of sagebrush steppe. While fire has always been a part of life on the sagebrush steppe, the megafires of late have consistently burned hotter and faster than those of decades ago. They also create the perfect storm for invasive annual grasses to take hold and push out perennial grasses. As a result, the fires of today have taken a devastating toll on both the landscape and wildlife. According to Palmer, "larger-scale and more intense wildfires have become more common, and have resulted in the reduction of intact sagebrush steppe and perennial grasslands." In short, there is less habitat, food, and cover for sagebrush steppe species to rely on for survival.

Making the Landscape Resilient and Helping Wildlife

The good news is that work is being done throughout Harney County to help the sagebrush steppe become more resistant to wildfire, and resilient in its aftermath. That spells good news for wildlife too. The complexity of the sagebrush sea ecosystems lends itself to a collaborative approach where there are many voices and perspectives at the table.

Vold works closely with the Harney County Wildfire Collaborative on much of this work. He says that "The efforts HDP and Harney County Wildfire Collaborative are undertaking to prevent wildfire in intact sagebrush steppe habitat are extremely important to the persistence of wildlife populations on the landscape." Harney County Wildfire Collaborative has brought together Rangeland Fire Protection Association members, federal, state, and county employees, tribal members, conservationists, scientists, and local ranchers to spray annual invasive grasses, remove juniper trees, build fire breaks and more through projects like the Southeast Oregon Wildfire Resiliency Project and others so that wildfires cannot only be more readily addressed when they pop up, but allow the landscape to be more resilient in the aftermath. These concerted efforts are intended to be beneficial for the landscape, wildlife, and people of Harney County that call the sagebrush steppe home.

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

HIGH DESERT Partnership