

# GROUSE OF THE SAGEBRUSH SEA

by John Dahlke / Photos by John Dahlke unless otherwise noted

*October 1886, Bates Hole, Wyoming - The number of grouse which flew over the camp reminded me of the old time flights of passenger pigeons that I used to see when a boy. Before long the narrow valley where the water was, was a moving mass of gray. I have no means whatever of estimating the number of birds which I saw, but there must have been thousands of them."*

*Grinnell, 1910.*

## INTRODUCTION

Accounts such as Grinnell's were relatively common when describing enormous flocks of sage-grouse encountered by early travelers in the American West. Now, less than 150 years after this statement, populations of this magnificent bird are collapsing across their entire range.

The sagebrush ecosystem was historically the largest interconnected habitat in North America. Spanning from the southern states of New Mexico and Arizona and extending up the flanks of the Rocky Mountains into southern Canada, this biome lies between grasslands and mountain forests. Low annual rainfall, coupled with long, cold winters and persistent snow cover limit the creatures that can survive here.

Rich in its own way, it supports a unique assemblage of wildlife that includes big game such as pronghorn, mule deer and elk. An elegant suite of small mammals populates the region, including jackrabbits, cottontail rabbits, weasels, badgers and the famous coyote among many others. Most early settlement was along stream corridors where supplemental water was available to irrigate a limited variety of crops. These farms became private lands through governmental efforts to develop the region. By contrast, much of the vast sagebrush steppe could not be converted to farmland, so it remained government-owned and is now known as public land.



KING OF THE LEK, PHOTO: CHARLIE HAMILTON-JAMES

Much of these uplands are still dominated by sage. There are some areas that appear untouched by civilization, with no houses, fences, or powerlines within view. This public land sagebrush steppe is the backbone of the sage-grouse domain.

For the last 25 years, it has been my pleasure and privilege to live and work in western Wyoming. A career in wildlife research and other scientific disciplines led to an opportunity to make my home near the small town of Pinedale. Shortly after I moved here, a massive natural gas drilling and production effort began in the area. Generally concentrated in the center of the Upper Green River Valley, multiple project areas totaling over 200,000 hectares contain more than 10,000 well sites, which are connected by a maze of new roads. Thousands of additional wells are planned and permitted, with 3,500 in one project alone. The development of these gas fields on public lands has produced untold millions of dollars in profit. Sadly, this concentration of disturbance lies within the last remaining stronghold of sage-grouse.

Concern for declining grouse populations in all states within their range resulted in a basic research need to investigate how the multitude of impacts associated with the gas fields would affect them. Through a series of research efforts spanning more than two decades, my wildlife consulting firm captured over 2,500 female sage-grouse on leks, fitted them with radio transmitters and then tracked the birds and their broods through their annual cycles. We documented where they lived in each season, how many chicks survived and how they shifted away from the gas fields over generations. We tracked some individuals for years. Through time, my employees and I essentially adopted the seasonal rhythms of these birds. This is how we entered the world of the grouse. It is from this background that I offer these thoughts.

## THE BIRDS AND THE LAND

Grouse species around the world have developed adaptations that allow them to exploit their environments. In every case they find the cream of the land and transfer that biotic energy to strong, powerful muscles and sleek feathers, producing birds that can face any wind. The Greater Sage-grouse (*Centrocercus urophasianus*), hereinafter sage-grouse or grouse, is a stellar example of this adaptability.



These are the largest North American grouse, with weights of 1,800 to 3,500 gm for males and 1,100 to 1,700 gm for females. The wingspan on fully adult males can exceed 100 cm. These impressive dimensions are greater than some species of geese. Their dark red breast muscles have a high capillary density that provides a steady supply of glucose and oxygen to drive their long, narrow wings which deliver high flight speed over long distances. Shifting across the open steppe to a more desirable location is nearly effortless for these powerful flyers.

Sage-grouse are long-lived compared to most other birds, with some individuals surviving to ten years or more. This adult longevity reduces the annual recruitment rate of chicks necessary to sustain a population. In general, about half of the



adult hens actually raise broods. Even with this low number of hens with chicks, only 1.5 surviving chicks per reproductive hen is required to sustain the population. With two chicks per hen, we have a growing number of birds on the landscape.

Their annual life cycle begins in an open area within the sagebrush, where the males gather to perform elaborate sunrise displays on communal breeding grounds known as leks. Regardless of how many males may attend a lek, only one or two dominant cocks do all the breeding. Lek locations tend to be very consistent over time, with yearly attendance numbers by males varying due to population cycles. Some remaining leks can host over two hundred cock birds.

Females visit the leks to be bred, solemnly walking past low-ranking males frenetically displaying their vitality, to reach the one or two dominant males. After breeding, the hens select a nest site hidden beneath the spreading branches of a sagebrush plant, laying their eggs in a rudimentary grass bowl. Most nests are within 3 miles of the lek. Depending on snow conditions, some hens travel much further. One radio-marked female we tracked traveled more than 60 miles to her chosen nest site for three consecutive years.

Typical clutches are seven to nine eggs and nearly all the eggs hatch. It is critical that the tiny chicks can find enough insects in their first days to power their small bodies. Information garnered through our field research revealed that most of the chick mortality occurs within the first three weeks after hatch. Tracking hundreds of hens with broods for production counts, we saw that broods which started out averaging seven chicks were soon reduced to only two or three. Once past this critical stage, most chicks survive for the duration of the summer. This reduction of brood sizes happens to nearly every set of chicks. That evenness is a strong indicator that it is the habitat that affects all the broods equally. Predation events would reduce some broods to zero and leave others untouched.

A moderate sagebrush canopy with a diverse herbaceous understory provides the forbs and insects needed by chicks as well as adults. Forbs are the small, broadleaf plants that grow under or between grasses most commonly known as wildflowers. Key forbs are legumes and the milky-juiced composites. Think of dandelions and other similar plants which exude a sap when broken. This plant moisture provides habitats for a wide range of insects such as aphids and other soft-bodied creatures. For the first two weeks of life, the diet of sage-grouse chicks is primarily these insects, which provide the hatchling grouse all the necessary protein and moisture that they need to thrive. The chicks do not require open water if they have adequate habitat. Soft leaves of legumes and similar plants are gradually incorporated into the diet as the chicks develop.

By three months of age, juvenile sage-grouse have diets similar to that of adults, which is primarily succulent forbs, leaves and insects. Sagebrush

and meadow habitats are used for food, shade and protection. Because of the importance of forbs during this time, drainage bottoms, streambeds and agricultural fields are commonly used. As forbs dry out in late summer, grouse begin to eat more sagebrush. After a few hard frosts they transition to their winter diet of exclusively sagebrush leaves.

Supremely adapted to their home, they are one of the few creatures that gains weight and physical condition during the bitter winter months. These grouse are at peak physical condition in March as they enter their breeding season. In contrast, many wildlife species that do not migrate or hibernate are in some level of nutritional stress as temperatures plunge and any forage that may remain is covered by snow.

## HAWKING

Pursuing these majestic grouse with falcons embodies components of a hunting experience that few quarries can match. To fully appreciate it, you must embrace where you are. First, you are struck by the panoramic spectacle of the hunt arena. A place where infinite skies suspend clouds racing like sailing yachts, where there are calm days with temperatures below negative 30 F and a cobalt dome overhead and where expansive basins framed by snow-clad mountain peaks run to the far horizon. And there, stretched out before you is the endless pitch and roll of the vast sagebrush sea.

Even after all my years hawking in these situations, each trip out has the feel of an expedition. This is partly from the feeling of isolation where no one else is seen and partly from the gear-laden vehicle always stocked and ready for emergencies. A falcon flight that turns into a long tail-chase can end several miles away, with the daylight losing its hold to a frigid night. A long hike in plummeting temperatures has a very real danger factor.

The flocks of grouse blend in superbly with the winter landscape and pointing dogs are essential to set up the waiting-on flights. The sweep of the sage expanses sets the stage for unparalleled dog work to locate the grouse. As fall progresses to winter, family groups coalesce into large flocks on traditional winter ranges. This gathering occurs regardless of snow depth or cold temperatures, but rather as a part of the annual social cycle of the bird.

Winter flocks in healthy populations can number well over 200 individuals and in some instances exceeding 2,000 birds. While these large gatherings surely produce a strong scent cone for the dogs, so many grouse grouped in one place means that there are many other places with no grouse present. Some days dogs must search for hours to finally locate the flock.

All pointing dogs are born with the drive to hunt instilled into them through countless generations of targeted breeding. Individual dogs then learn through experience how to handle the various types of quarries that they seek, with tactics changing through the seasons. A grouse dog must learn how to detect small groups of sage-grouse in the difficult conditions of early fall, when the birds are widely scattered in a very dry environment. Pointing dogs during this season must be cautious on their approach to the game and not get too close. At the other end of the spectrum are the big winter flocks, always standing in snow with wet feet, giving off a scent so strong that some humans claim they can notice the smell. Experienced dogs can detect flocks at astonishing distances; a full mile being nothing unusual. They then work into the wind, quartering back and forth to pinpoint the flock. As the dog narrows in on the birds it slows to a staunch point. Only experience can teach the dog and the falconer when the grouse are truly pinned and close enough to slip the falcon. This is especially important with gyrfalcons that may not keep their pitch or position for extended periods of time.

One of my chief enjoyments of this specialized form of hawking is watching a pointing dog flow over an unobstructed snowy landscape. Each dog develops its own particular style of hunting the land and determining its approach to the grouse. The falconer interprets what the dog is telling him with its gait, head position and other factors. At the first hint of scent, everything changes. The dog starts following the olfactory trail upwind towards the birds and by casting in broad arcs the scent cone is narrowed to the target. The final point is preceded in many different ways. Some dogs virtually vibrate with excitement on multiple brief points, then move forward. Other dogs are more careful and calculating, slowly creeping forward until freezing into a rock-solid point.

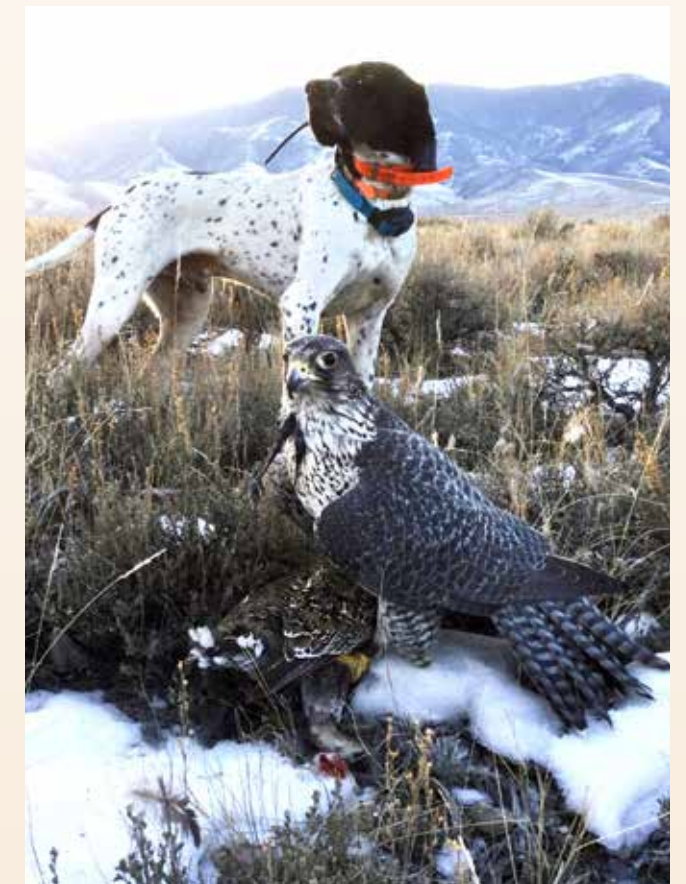


ABOVE: INTERMEWED PASSAGE GYRFALCON ON COCK GROUSE, PHOTO: DARRYL BARNES  
BELOW: INTERMEWED PASSAGE FEMALE WITH COCK GROUSE, PHOTO: HUBERT QUADE

In particular I recall a favorite Brittany, Sadie, and her unique talents. She was not only a hawking dog but also a part of our research team, finding grouse nests in spring and in summer locating broods. With her broad experience, she would approach the grouse in a deliberate manner, shifting as necessary to finalize her decision. When she finally stopped, Sadie would then look back at me over her shoulder in slow motion in an obvious statement of "I have them".

I know of no better words to capture that link between dog and man than these penned by Leopold (1949) in pursuit of Partridge, his name for ruffed grouse: "he advances with stealthy caution, his wet nose screening a hundred scents for that one scent, the potential presence of which gives life and meaning to the whole landscape. He is the prospector of the air, perpetually searching its strata for olfactory gold. Partridge scent is the gold standard that relates his world to mine".

Seeing any group of 500 to 1,000 birds lift off the ground is an exciting moment, and with the enormous sage-grouse even more so. In the winter habitat where these concentrations occur, the birds are not evenly spaced within the flock. They are in smaller



groups scattered over a generally flat area that may be a mile or more across. When one group flushes, they induce other groups to become airborne as they fly over them. This results in the spectacular sight of waves of these big birds rising from unseen positions in the sagebrush. Unlike many types of waterfowl which rapidly come together in coherent flocks after a group flushes, a large winter flock of sage-grouse tends to mill around for some minutes before they break off into more cohesive groups and leave the area. The air seems full of grouse.

The flight characteristics of these birds correlate to the sheer size and power that they possess. They flush in a manner similar to other grouse, where they launch themselves vertically, then level out to accelerate. Due to their large mass, their speed starts slowly but builds rapidly. The size of these grouse in the air visually belies their actual air speed. As with aircraft or sailing ships, the bigger they are the faster they go. Once they are up to top speed, no falcon can overtake them in level flight.

The flights that I strive to orchestrate highlight the mental and physical strengths of the gyrfalcon. The most rewarding in my estimation start with the gyr commanding the sky well off upwind of the pointing dog and very high. Grouse flushing in this situation are less intimidated than with a falcon waiting on directly overhead and fly strongly, gathering speed and altitude. The falcon initiates a low angle powered flight which slants across the sky until it is above the fleeing grouse. Now the gyr delivers its signature blow; a short, sharp, nearly vertical stoop on quarry that may be hundreds of feet in the air. Not only is this a breath-taking sight for the falconer, but more disabling strikes are made from a stoop, thereby reducing long tail-chases.

If not struck down in the initial set of stoops, the wounded bird heads for security cover. On the steppe this is the taller sage along ephemeral stream drainages where there are better soils and more available moisture. These chases can go for miles to a precise piece of escape cover. Having flown falcons over the same areas for more than 25 years, I have seen specific patches of escape cover used again and again by generations of sage-grouse. These birds know their territory every bit as well as you know your own home and I believe that they know exactly where they are headed before they even lift off the ground.

To the distress of the falconer, gyrfalcons in particular excel at this flight. Something deep within these falcons ignites when they chase. They will follow an intimidated grouse for long distances, then close as the bird slows to put in to cover. They do this so often that it seems hard-wired into their brains. The gyr can be at a height where it appears that they could easily cut a grouse in half, yet they strike a glancing blow on the back and then lock in behind the quarry in pursuit. Many wild-taken passage female gyrfalcons use this technique as their main method of killing sage-grouse.



As fall turns to deep winter, there is a narrow window of time when the grouse and the gyrfalcon are in peak physical condition, as colder temperatures bring out the best in both, yet remain bearable for humans. This is when falconry on the steppe is at its finest. But with the changing weather comes a new worry. Here, now, the golden eagle becomes the sword of Damocles hanging somewhere in the sky.

This is the danger time. All day long the eagles watch their world. A gyr chasing a grouse across a frozen landscape is a dinner bell. If the falcon kills the grouse, it is an easy meal for the eagle to pirate. But for the experienced falconers that hawk sage-

grouse there seems to be an additional factor at work. A disproportionate number of pure gyrs over hybrids and peregrines are killed while down with this quarry. There is some speculation that eagles kill the larger falcons to rid their territory of a competitor.

There is also strong suspicion that in an area frequented by falconers, a resident pair of eagles has learned to recognize and is targeting hawking parties. Multiple falcons have been killed in a relatively small area. Few humans are out in the winter sage and surely a golden eagle can recognize a slowly moving vehicle with a bird dog coursing out front. The risk from eagles varies widely but is ever-present. During the premier hawking season from December through February eagle densities can increase dramatically in just a few days when migrants appear.

Some falcons learn to avoid eagles in various ways. Often this is simply watching the sky and abandoning the kill as soon as an eagle appears. Other falcons will leave the area before the flight even gets underway if they see an eagle. The most interesting tactic that I have witnessed was used by two different falcons who, immediately after dispatching their grouse, would leave the quarry and fly 50 yards or so to a perch with good visibility and just sit. From this safe position, they would calmly scan the countryside for signs of danger, showing no sign that they had a prize.

## THE PROBLEMS

Sagebrush grasslands are a heavily-used landscape. Humans have plowed, sprayed, burned, drilled,

developed, mined and grazed millions of acres of sagebrush habitat. The remaining habitat is fragmented and degraded by weeds, wildfire, juniper encroachment, utility corridors, roads and fences. This sweeping ecosystem is suffering the death by a thousand cuts.

Today, the overall geographic range of sage-grouse has been reduced by almost half with the loss of sagebrush habitats, and total grouse populations have declined to just ten percent of their historic numbers. As with so many ecological crises, there is no single factor driving down populations of sage-grouse. Through my professional participation in local, state-wide and national groups formed specifically to try and reverse the declines, we have assessed a bewildering array of impacts on grouse. In nearly every case the people associated with that particular action deny that their activity is having an effect.

Broadly speaking, threats to grouse can be divided into three categories: permanent habitat loss, habitat degradation and climate. When an area of steppe is changed to a housing development, airport or other infrastructure project, it is permanently eliminated for grouse. Similarly, most prime lowland habitats have been converted to some kind of agricultural crop, few of which have any value for sage-grouse. This also is permanent.

The largest driver of habitat loss now is wildfires. Each year more fires are burning larger areas of sagebrush ecosystems. While it is possible to restore these scars, it is difficult to achieve success. Invasive grasses, cheatgrass in particular, provide ready fuel sources for new fires. Sagebrush is not adapted

VOLATILE OILS PRODUCE HEAVY, BLACK SMOKE WHEN SAGEBRUSH BURNS, PHOTO: CHARLIE HAMILTON-JAMES





OVERGRAZING LEAVES FEW RESOURCES FOR WILDLIFE, PHOTO: CHARLIE HAMILTON-JAMES

to frequent fire intervals and does not resprout after being burned. The volatile oils present in these plants provide an explosive fuel that burns extremely hot, destroying much of any remaining seed bank. Once a sage system has burned, it often gets into a rapid cycle of re-burning where any sagebrush seedlings are destroyed.

Habitat degradation covers a vast array of impacts. Nearly all sage habitats have been grazed by domestic cattle and sheep, typically at the same time of year, decade after decade, for over one hundred years. This regimen has shifted the sage understory from a bunchgrass/forb community to one dominated by rhizomatous grasses that is much less productive for grouse. Highways and roads bisect habitats and many grouse are killed by impacts with vehicles. Rural powerlines kill an untold number every year.

Barbed wire fences in place to manage livestock stretch across all areas at various densities, with some particular spots killing and maiming grouse year-round. Sage-grouse did not evolve with obstructions on the steppe and during flight often just skim the sage, especially at ridgelines. Though the hundreds of thousands of reflective markers that have been installed on fences have reduced the number of strikes, they do not eliminate collisions. During the last ten years over 900 fence strikes by sage-grouse have been recorded in just a portion of my local area. More than half of these were on sections of

fence where reflective markers had been installed.

Annual and cyclic rainfall has tremendous effects on sage-grouse reproduction. Survival of chicks is dependent on available moisture in their environment. Climate change has thrown much of the remaining sage-grouse range into long-term drought conditions that are becoming more severe with each passing year. Latent soil moisture and spring rains determine the relative lushness of the steppe and of forbs in particular. Without this precisely-timed bloom of plant and associated insect life, the chicks have little hope of survival.

## EPILOGUE

The plight of an exalted quarry is nothing new to the falconry community. Our other prairie grouse species so sought after by North American falconers, prairie chickens and sharp-tailed grouse, are getting more difficult to find each year. Houbara, red grouse, pheasant, grey partridge, hares and so many others that have been staples of classic falconry all have their own population issues. Availability of the quarry we love and need in falconry is becoming our largest limiting factor and greatest challenge to achieving excellence in game hawking.

The push by commercial agriculture to produce ever more crops from the same lands is resulting in more insecticides and herbicides being applied. Due to war in eastern Europe in spring of 2022, wheat prices are surging, which encourages the conversion of even more marginal lands into row agriculture.

Fields that were once rested and rotated are now farmed every year. Shifting farming practices have caused boom and bust cycles of gamebirds in many regions and in many times. However, it is difficult to live in these hard times, while remembering how good it was “in the old days”.

One state after another is now limiting or closing sage-grouse hunting seasons. While falconry is allowed where gun hunting seasons are still open, in some states the annual harvest limit per hunter is two grouse and in others only one bird per season. Obviously, these are just a token for a falconer and insufficient to develop a grouse hawk. It is feared that our few remaining extended seasons of up to seven months that are so cherished by American falconers will also soon be restricted.

In some respects, the sagebrush sea can be likened to our liquid oceans. Once both were thought so immense that no human interference could ever be detected. They were obstacles to be overcome and, where possible, to produce monetary profit. But as we see populations of more and more specialized creatures collapse and even find minute particles of plastic in the flesh of ocean fish we eat and the water we drink, the human race is starting to realize what a “world of hurt” we now face. Unless the juggernaut of compounding forces is somehow abated, there is the very real possibility that we will see the functional collapse of the sagebrush steppe within our lifetimes.

## THE UPSHOT

The rewards of sage-grouse hawking are well worth the effort and risk. Months or even years of preparation lead to this hunt, with the falconer depending on his dog’s skill and power to find the birds in the vastness. Ice crystals float slowly down out of that cobalt sky, each a tiny prism splitting the brilliant sunshine into its rainbow components. The only movement is the coursing dog and a pair of jet-black ravens heading for some important destination. Snow crunches underfoot as a herd of pronghorn watches the activity from the crest of a rise, ready to flee. Big, powerful falcons are on the cadge, eager to launch into the cold air. These are the days that pull me in. The days when I feel an intimate connection with the steppe, in a tableau of falconry that has drawn humans for millennia.



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