

Special Report

SAGE GROUSE

Son of spotted owl. By Carolyn Dufurrena

J. Wayne Burkhardt, Ph.D. ■ Julie M. Burkhardt ■ Hank Vogler ■ Peter Skene Ogden



The annual display of sage grouse on their strutting grounds—called leks—is one of the most dramatic wildlife spectacles in the West. It is here you will find male sage grouse popping air sacs on their breasts, puffing and fighting for the attention of females. Note: Sage grouse are the same size as domestic chickens and are also known as sage hen or sage chicken.

The Endangered Species Act and the spotted owl were used by radical environmentalists and government agents to destroy the timber industry in the 1990s. Their cruel and nearsighted actions changed lives and livelihoods and forced closure of hundreds of mills that devastated rural economies and communities.

Loggers never threatened the spotted owl's existence, but its tougher cousin the barred owl and fire suppression did. Recently, government agents have put a bounty on the barred owl while western forests are overgrown, diseased, dead, or dying.

Now the same players are using the same law, similar myths, and another pretty bird to threaten

agriculture in 11 western states. That could hurt more people, eliminate more jobs, and ruin even more rural communities—especially in the Great Basin.

What's the point? Some believe it's to get rid of agriculture and recreation from federally managed lands. Others believe it's not high-desert land, livestock or a few visitors that's the problem, but unmanaged predators and an onslaught of massive, unreadable reports from the federal government (using forestry products) that will bury the best in the West.

What's the future? Perhaps the flashy sage grouse will just become lunch for two- and four-legged predators.—C.J. Hadley, publisher/editor



Wild Chickens on Desert Creek

Dick Huntsberger has so many birds in his neighborhood that the Department of Wildlife uses it as a learning site to train volunteers. By Carolyn Dufurrena

It's easy to get to, but easy to miss. Desert Creek is a sweet little valley tucked between the rugged mass of the Sierra Nevada and the wide green hay meadows of Smith Valley. The high peaks to the south and west shelter sagebrush slopes. Dark ridges covered with juniper tower over well-watered thousand-acre pastures. As the sun sinks behind a snowcapped ridge, a flock of sage grouse sail over Dick Huntsberger's place. He bids them goodnight.

Is this a pristine, cattle-free zone hundreds of miles from civilization with all fences marked so birds don't fly into them and little bitty ladders climbing the sides of all troughs? Well, no. Dick lives on a small ranch within a few miles of Highway 395, the pipeline which delivers commuters to this lovely exurb from the burgeoning communities of Carson City, Reno and Gardnerville. It's also home to a healthy breeding population of sage grouse.

Dick's home place on Desert Creek near Wellington is surrounded by sage grouse. There's a lek (a strutting ground) literally a



Desert Creek Ranch is surrounded by sage grouse. This bird struts within sight of the Smith Valley airport hangar, just a stone's throw from Dick Huntsberger's back porch. ABOVE: Dick points out areas where he's spent the last two years with Natural Resources Conservation Service assistance treating 1,500 acres of BLM land for juniper encroachment. That will help all wildlife.

stone's throw from his back porch, one so stable that wildlife volunteer coordinators from Nevada Department of Wildlife (NDOW) use it every spring to train volunteers. When our photographers went to get a

few shots of the birds on the lek, there were so many groups of sage hen enthusiasts standing around that they couldn't get anywhere near the birds.

The Smith Valley sage grouse is a special creature. "They're not exactly a subspecies, but they're genetically different somehow," Dick says. "We can't really get anybody to explain." The bistate population along the Sierra Front is geographically isolated and being evaluated separately under the Endangered Species Act, with a decision due in September 2013. It's categorized as more urgent than the greater sage-grouse with a decision to come down in 2015.

"I asked Shawn Espinosa, sage grouse head for NDOW, to describe the breeding population on Desert Creek," Dick says. "He said it was improving. I observed that most spring evenings I can see 40 or 50 sage grouse fly over my head while I'm doing my chores. Not only that, but those birds spend the days in the foothills, in the juniper trees across the county road. They fly over the power lines, over that road, over

the airstrip, over my house which was built in 1979, and they land in the meadows on the other side that are grazed by cows.” A special and robust population, indeed. “What nobody can seem to pinpoint is how many birds are needed. How many do we have? Is it 400? Is it a million?”

Nobody seems to have the answer. One thing that seems clear is that the harder the search for these birds, the greater the find. “In 1991, a one-day aerial survey of the Pine Nut Mountains discovered eight strutting males on one lek,” Dick says. “For years, that was the official count in this mountain range. On another day, in the 2000s, 80 birds were observed from the ground, in one meadow. Did the population explode? Or did we just do a better job finding them?”

Dick runs cattle allotments in the Pine Nuts, and summers them on pasture near Bridgeport. His allotments are home to what appears to be a healthy population of at least 100 sage grouse. Dr. Peter Coates is conducting a multiyear study for U.S. Geological Survey, mostly funded by BLM, to get a more accurate estimate of the number of birds in the population. Thirty now wear radio collars and GPS transmitters—“necklaces” or “fanny packs”—so that Coates can keep track of them. Dick explains: “We want to know more about their distribution and seasonal patterns of movement of the flock.” The birds breed and nest on the north end of the Pine Nuts and summer on the south end. They’ve discovered that there are actually quite a few more birds than they thought there were.

Dick has been part of the Bi-State Sage Grouse Working Group for a decade, one of the few remaining ranchers. “If you don’t go to the meetings, you don’t find out what’s going on,” he says. He wants to understand the issues and make an impact, in a positive way, on the outcome. But when he scrutinized his allotments on NDOW’s new Sage Grouse Habitat Categorization maps, he knew there was a problem. These maps combine different types of satellite data to predict what types of sage grouse habitats will look like—from space. Unfortunately, pixels generated by satellites don’t always recognize grass or sagebrush, and they don’t always match what’s on the ground.

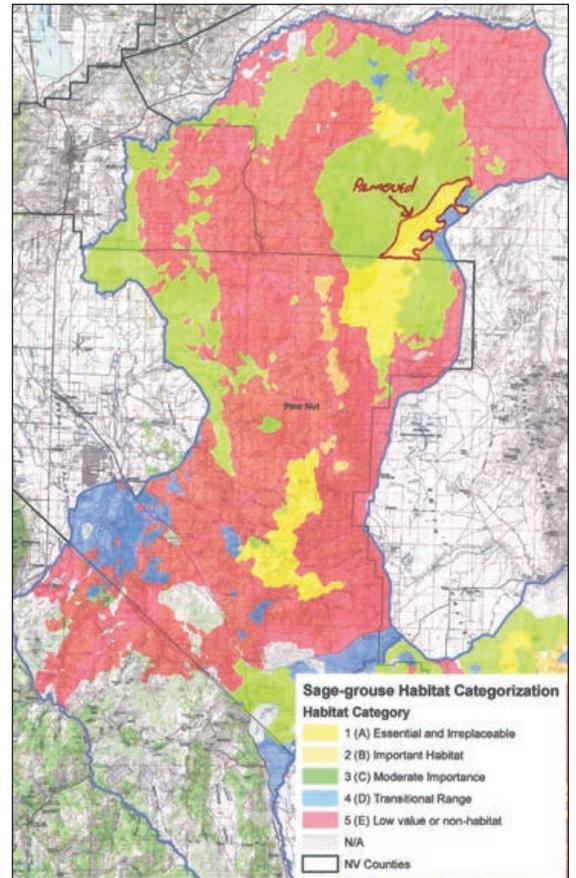
In Dick’s case, an area that was identified on the map as strategic sage grouse habitat was half meadow (indeed strategic) and half greasewood flat. Fortunately, he was able to discuss this issue with the relevant folks, and his updated map more accurately reflected

what is on the ground. Coates explains: “These maps are based on some reliable [remote sensing] products. Whether or not they’re reliable, it’s the best information available.” Either way, these maps will be used to assist with management decisions that directly impact grazing decisions and ranchers’ livelihoods.

In the meantime, Dick stays upbeat. He’s working with the Natural Resources Conservation Service Sage Grouse Initiative on a juniper encroachment project that’s intended to open up areas for the sage grouse and other wildlife on his allotments. It’s part of a larger, 7,000-acre BLM project to benefit sage grouse. “We have completed removal of all the trees on 380 acres, and we have just under 1,200 more acres to treat. Our BLM folks have been really decent to deal with.” Although he’s had bad experiences with crusaders in uniform in the past, he says “the wildlife biologists we have now are excellent.”

Frustrated with environmental groups that continue hounding state and federal agencies with lawsuits, Dick says: “I’ve spent 10 years working with this statewide plan. We are actually doing stuff out here to try to improve the habitat, and we’ve never seen one of those environmental guys out here.” No matter what good work the ranchers and agency people do, “the environmental groups

just keep suing. The end result is that the judiciary in this country is doing land management. What’s wrong with that picture?” ■



On Nevada Department of Wildlife’s new Sage Grouse Habitat Categorization maps, Dick knew there was a problem. The maps used satellite data which don’t always recognize grass or sagebrush accurately. Some “strategic sage grouse habitat” turned out to be a greasewood flat. Dr. Peter Coates’ research group is trying to improve future versions of the NDOW map using better sage grouse location data. BELOW: Dick turns a wayward cow back toward the ranch. She was taking her calf to the high country ahead of schedule and needs to travel with the herd.



MAP COURTESY NDOW & DICK HUNTSBERGER

Predators in Black

Enviro groups sue while people of the West are punished. By Carolyn Dufurrena

Picture this: a landscape of low-growing sage with grasses between the brush; 60 percent of the ground has some kind of cover. A tiny movement in the middle of a clump of brush betrays the presence of...something. Closer inspection reveals a nearly invisible sage hen on her nest, tucked deep between the branches.

A shadow, then several shadows, flicker across the scene, and in a moment a flock of ravens lands on the ground. From high in the sky, they've spotted the hen. Their long black beaks open, they hop toward her nest. One raven aggressively harries the bird until it is



forced off the nest. Ten round eggs lie in the shade, for another moment. Helpless, the hen watches as the ravens crack every one of the eggs, eat some of the contents, and fly away,

laughing raucously.

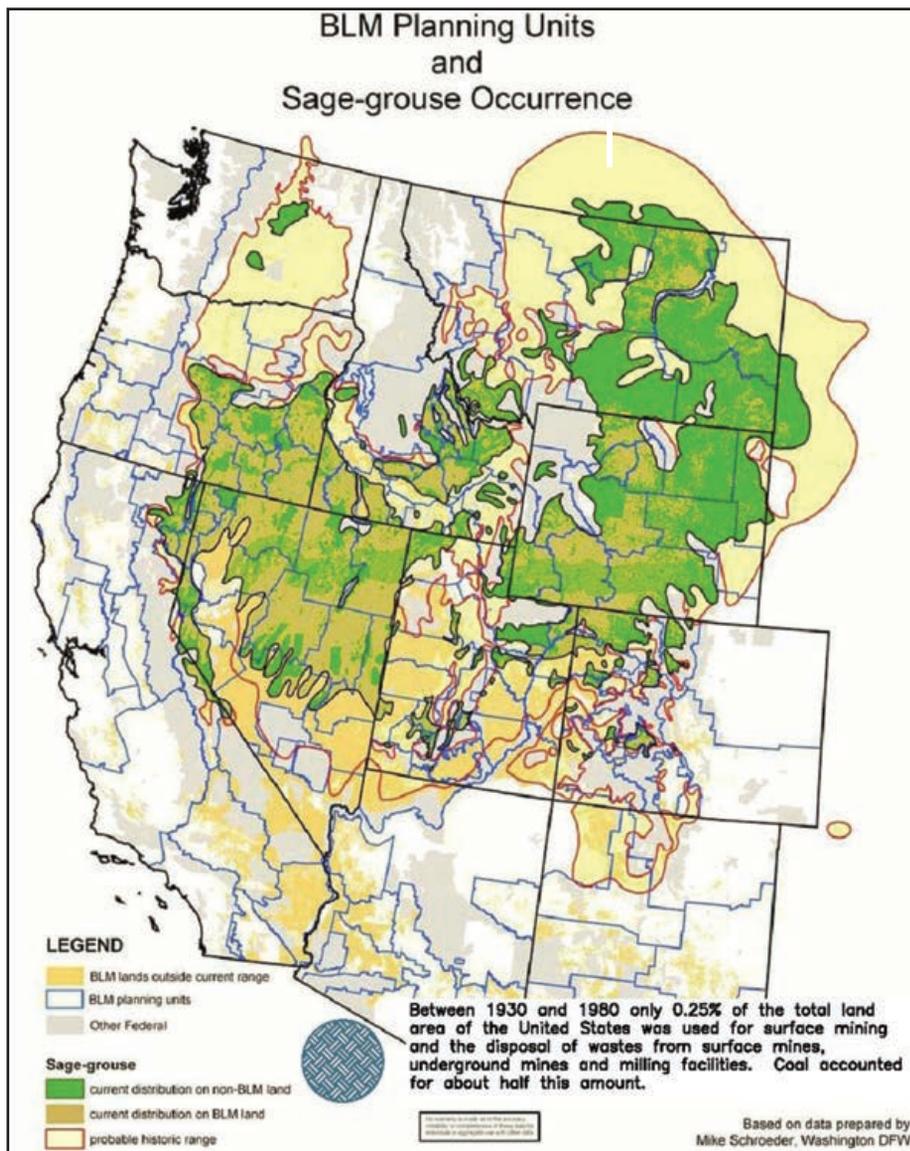
Ravens are smart, opportunistic predators of sage grouse and many other ground-nesting birds. Their numbers have increased at least 600 percent in Nevada in the last 20 years and more than 1,500 percent in some places. According to research biologists who study raven predation, these black birds have a more deleterious effect on sage hen nest survival than any other single element, even more than the amount of cover in the habitat.

Dr. Peter Coates is a wildlife biologist with the U.S. Geological Survey. USGS scientists now provide the primary research for U.S. Fish & Wildlife Service (FWS) in the effort to gather information on sage grouse habitat, predation and survival. Coates says, "We need to manage for both cover and ravens. They're interactive."

Here's another, analogous picture: a courtroom full of lawyers in expensive black three-piece suits in U.S. District Court in 2011. Arguments proceed for the plaintiffs: imagine Western Watersheds Project, WildEarth Guardians, or the Center for Biological Diversity. The defendants: U.S. Fish & Wildlife Service. Observing, officials from Bureau of Land Management (BLM), U.S. Forest Service, and God knows who else. Environmental groups prevail, and FWS, "in an effort to improve the implementation of the Endangered Species Act, agrees to address the needs of more than 250 candidate species over the next six years."

Included in the agreement are stipulations to complete reviews of the bistate sage grouse population by 2013 and the greater sage grouse by 2015. If the sage grouse is listed, it will be in the purview of the FWS to bless every activity that occurs on public lands: hunting, off-road rallies, camping, trail riding, agriculture, and that new gazebo in your summer home's backyard. Environmental groups sue the feds, but it is the people of the West who are punished. What the Natural Resources Conservation Service reports is that 40 percent of sage grouse habitat is on *private* land. The restrictions to activity will still apply. Ravens are serious killers of sage grouse, but they are not the only ones.

As environmental groups continue to file multiple lawsuits and clog the judicial and land-use management systems with one listing after another, the western way of life faces extinction. And as the black suits leave the courtroom, raucous laughter can be heard.



Green shows current distribution of sage grouse on non-BLM land. Tan shows distribution on BLM land. Pale yellow is "probably historic range." Mining activities occur in the same areas.

The legalities of it all

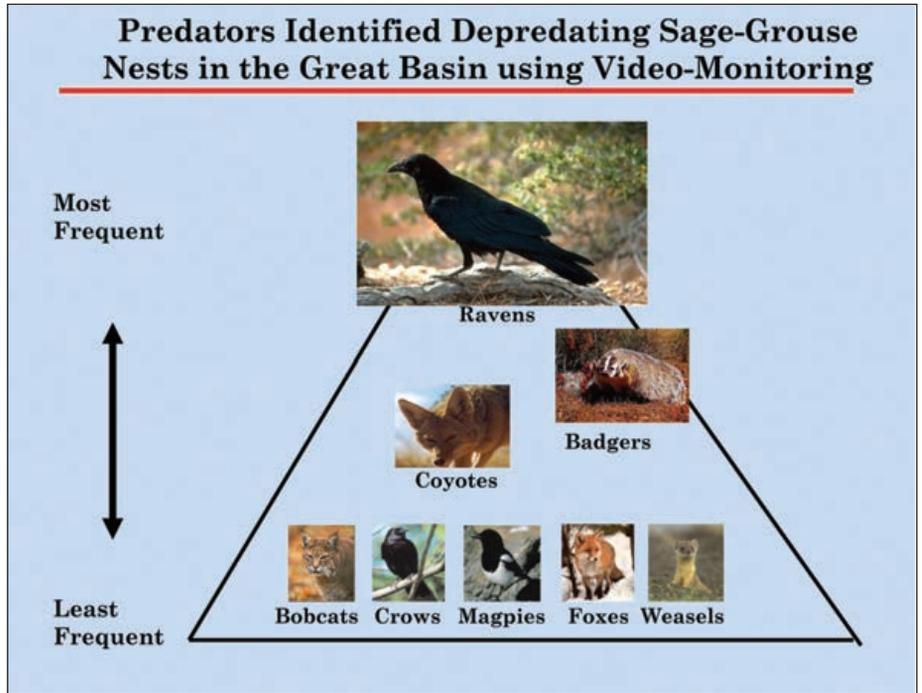
FWS says that to protect the sage grouse from extinction, the minimum effective population range-wide is 5,000 mature birds, with 500 breeding adults per region. The current estimated population for greater sage-grouse is between 350,000 and 535,000 birds, which is 70 to 107 times greater than the “minimum effective population.” At the current rate of decline of 1.4 percent per year, it would take 300 years for the population to dwindle to the minimum effective population of 5,000 birds. Is that endangered? It doesn’t sound like it.

A complete picture of Great Basin sage grouse numbers since written records began shows that presettlement populations were low but well scattered. Populations dramatically increased between the late 1800s and early 1900s. Sage grouse peaked around 1930 and remained high through the 1960s. They declined rapidly from the 1970s to the late 1990s as livestock grazing and predator control were reduced throughout the West. Populations declined more slowly from 2000 through 2010. The Nevada Department of Wildlife (NDOW) has even reported an increase in birds in some areas since 2008.

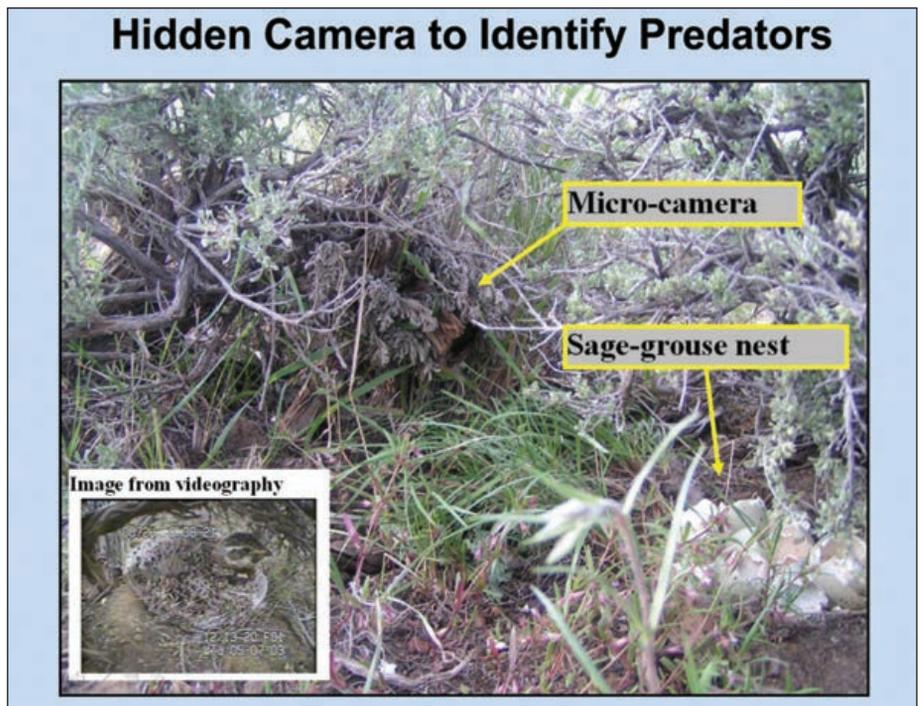
U.S. Fish & Wildlife Service’s own determinations show that the greater sage-grouse is not legally qualified for listing under the Endangered Species Act (ESA). FWS does not manage land use on public lands; BLM and the U.S. Forest Service do. Nonetheless, a sage grouse listing will put FWS in position to control land management throughout the West. And BLM is now forced to implement sage grouse conservation measures that negatively impact all economic activities across the species’ entire range.

Even though “livestock and sage grouse are not competing with each other,” according to Washington state wildlife biologist Mike Schroeder, the Threats to Sage Grouse and Habitat graph on next page shows that livestock grazing and agriculture are near the top of the feds’ list of threats to sage grouse survival. Every American taxpayer will bear the burden of enforcing new regulations and the exponentially rising costs of conducting natural resource-related activities. Anyone who kills a sage grouse could face a fine of up to \$40,000 and jail time.

Federal land-management agencies have hired San Francisco-based contractor Environmental Management and Planning Solu-



Research conducted by USGS, Idaho State University and NDOW used hidden cameras to catch sage-grouse nest predators in action. Ravens depredated more nests than coyotes, badgers, foxes or weasels. More than 13,000 sage grouse are lost to ravens in Nevada annually. Ground squirrels have been wrongly accused of nest depredation. They nibble on broken egg shells for the calcium.



tions Inc. to prepare Environmental Impact Statements (EIS) to incorporate greater sage-grouse conservation measures into federal land-use plans. The purpose is to “avoid a potential listing under the Endangered

Species Act” by FWS. Under the ESA, a species can only be listed as endangered if it is in imminent danger of extinction, or as threatened if it is in danger of extinction in the foreseeable future.

In the last week of December 2011, BLM released two Instructional Memoranda to instruct field officials in all program areas—that’s recreation, off-road vehicle use, mining, camping, trails, everything—to implement specific conservation measures in “preliminary priority habitat” for sage grouse. Preliminary priority habitat is all the highest quality breeding habitat that supports 75 percent of the known population or about a quarter of occupied sage grouse range.

Biologists assume that if they count the breeding males on known leks and multiply by two, they’ll have an accurate count of the population. The BLM maps are generated on the basis of observed males at the lek site. However, studies made in the bistate population on the Sierra Front show that there can be at least three times that many birds. Some leks are counted from the air, but most federal employees and their volunteers pretty much travel in four-wheeled vehicles so they’re constrained to leks that are close to the roads. NDOW is training volunteers to count as many leks as possible, because its agents cannot get to them all. “There are a lot of leks out there.” NDOW biologists will use the volunteers’ data in addition to their own. Is that all the birds? Is it 75 percent? Shouldn’t every cowboy on horseback and shepherd be counting sage grouse, too?

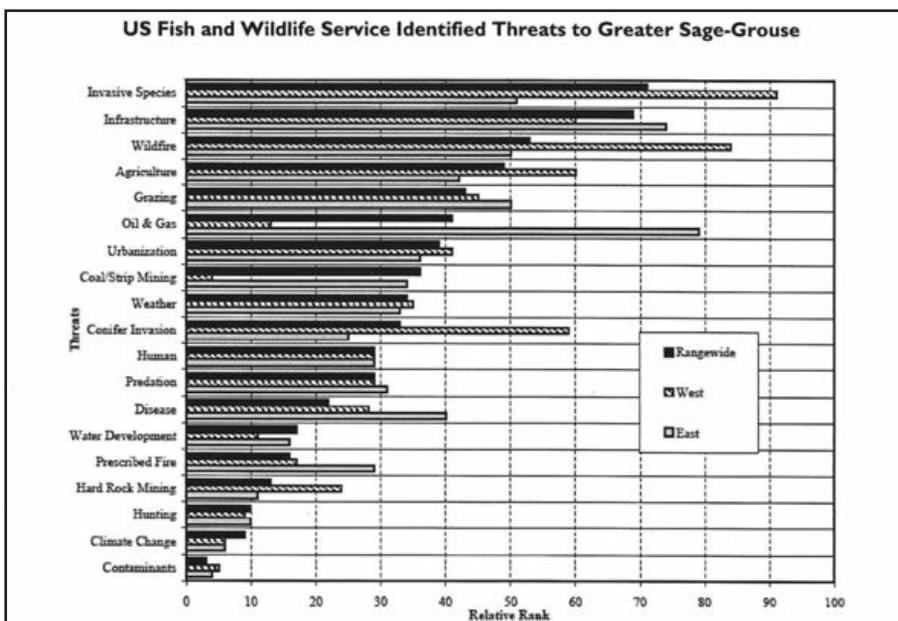
While BLM’s goal is to promote sustainable populations, the new regulations stipulate protection for 50 times as many birds and across a landscape 100 times larger than the area needed by the minimum effective population. How did this happen? It is the outgrowth of a subtle change in wording contained in the goal statement of the BLM report, which states that the agency “endorsed the goal” of the greater sage-grouse Comprehensive Conservation Strategy “to maintain and enhance populations and distribution of sage grouse by protecting and improving sagebrush habitats and ecosystems that sustain these populations.”

Note the goal endorsed by the BLM. The change in wording is small but crucial. It changes the target population from one that sustains the survival of the bird to the current population at least 70 times more birds over a much larger land area. The Notice of Intent states that the purpose of the EIS process is to “avoid a potential listing” of the greater sage-grouse under the Endangered Species Act. But conservation measures identified and already implemented actually provide ESA-styled protections to many more birds over a

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ABOVE: Greater sage-grouse, getting ready to strut for females in Elko County, Nev. BELOW: This graph shows that livestock grazing and agriculture are near the top of the feds’ list of threats to sage grouse survival. People working on the ground and much anecdotal evidence suggest that FWS’s order is wrong.



much larger landscape than would be the case if the birds were to actually dwindle to the point where they met the criteria for listing under the ESA.

Not yet son of spotted owl

In the 1980s, environmentalists raged that the spotted owl would become extinct unless logging in the critical habitat of old-growth forests was obliterated. Millions of acres of forest were labeled for protection and set aside. Due to environmentalist pressures, the logging industry on federal forests and hundreds of western rural communities became economically extinct. The entrepreneurial growing of certain recreational drugs replaced logging as the primary cottage industry of many rural forest communities.

For years, the spotted owls' critical habitat of old-growth forests has been increasing, but come to find out, protection or no, the spotted owl population has continued to fall more than 40 percent over the last 25 years. Wildfire in overprotected forests has leveled hundreds of thousands of square miles. Barred owls have become the bullies of the remaining forests, pushing their spotted brethren further into decline.

Now the Obama administration has blessed the killing or removal of the barred owl to allow the spotted owl to reclaim its territory. Interior Secretary Ken Salazar has endorsed a Forest Service draft plan to nominally reintroduce "ecological forestry," to keep wildfire from managing the forests in its ubiquitous way.

Hopefully the black suits in the Interior Department will cast a critical look at this environmentally engineered debacle. Perhaps they will notice that there's a successor to the spotted owl waiting in the wings, and that the future of ranching and western rural life on the sagebrush steppe may well suffer extinction because of the greater sage-grouse, and that ultimately, the greater sage-grouse may go the way of the overprotected spotted owl. Perhaps they will remember that those who do not learn from their history are condemned to repeat it.

Surely the suits in Washington have thought of this possibility. Wait! Do you hear that raucous cackling? ■

Carolyn Dufurrena is a geologist, teacher, rancher and writer from Winnemucca, Nev. She thanks Quinton Barr, Western Range Service, Elko, Nev., for slogging through thousands of pages of federal language to contribute to this story.

Data Blizzard

Trying to swim in the feds' tapioca. By Carolyn Dufurrena

Ranchers like Dick Huntsberger and Fred Fulstone have their day jobs: managing the water on their lands, calving heifers, moving cattle, vaccinating, lambing, shearing, marking, putting out salt, paying the bills, taking care of their employees and the range. But they also have another job...managing the data blizzard, the unbelievable volume of government paperwork that comes from dealing with federal agencies responsible for managing public lands.

In 1995, Vice President Al Gore coined the term "ecosystem management." Think about that for a moment. It's an arrogant term, really. Think of the complexity it erases. Think of the ecosystem that is your house. The piles of laundry, clean and dirty, the flow of junk mail through the mail slot, packages piling up on the front doorstep.

Now imagine the lot on which you built your home and the neighborhood in which you live. You work on the house, repair the roof, maintain the lawn, keep it watered, the roses pruned, the fences tight, but anyone in the world can wander through your yard. There is an absentee landlord, who almost never visits, but manages the land for everybody. Little old ladies can totter through, picking berries from the bushes that you water. Kids on dirt bikes can ride through the yard and even build jumps across the lawn. Neighborhood packs of feral dogs can play there. The neighbor who bred rabbits 50 years ago, who no longer lives here, let his rabbits go free before he left and they now live under your roses. You are not allowed to kill them, or even move them to someone else's yard. They are now Mustang Bunnies, protected by the landlord.

It is your responsibility to make things look pretty and undisturbed, and to document what you do on a regular basis. Emotional tempests that follow the El Niño of job layoffs, the swoop and glide of the markets, shifts in the jet stream, the precession of the planets, must all be managed, even that damn butterfly, flapping its wings in the rain forest in Brazil. This is critical habitat, and standards must be adhered to if you want to occupy this space.

Flocks of awful black predator birds have moved in and they bully your pets. You can't do anything about it because they are pro-

tected, too. They harass another creature that has always been there, but regulations make its life more difficult now. Someone thinks it is more special than all other birds. Or maybe they just want your place.

If your personal ecosystem is complicated, imagine the interactions that take place in the larger world. Now imagine being personally, fiscally responsible for the health of a watershed, for the quality of the soils, for the length of the grass, for the small gray bird that provides lunch for every predator, four legged and two, that moves through the landscape, whether or not there is flood, fire or drought romping through the countryside.

Today, this is where we find ourselves.

A great gray mass of paper begins to coalesce in the corners of our lives. It gathers like a distant wave, meeting itself across the wall of the bedroom. It is like a tsunami of information on the horizon waiting to be read, digested after dinner, after the bills are paid, the vaccine ordered.

We are inundated by a sea of words, and it seems we will simply disappear underneath. The sea will rise and rise until there is no way to deal with it all, because none of it is ever, ever thrown away, even when its relevance appears to be exhausted. We spend nights wading through soulless, boring paragraphs. It is like trying to swim in tapioca. We read and highlight, we underline, and we breathe. And we do not drown.

The days of running livestock without scrutiny are far behind us. We measure stubble height. We fax actual-use numbers to our federal agencies every month. The feds know where our animals are at all times. Research scientists now tag wildlife with collars. GPS transmitters dot the landscape. We are becoming the Big Brother of the natural world, tracking every movement of creatures which, well, deserve some privacy. We have buried the sage grouse, and ourselves, in paper. Does all this documentation help that gray bird? Or is it just a way for those of us who spend our lives and energy in the city to participate in, to control, a world which is not our own? ■

Adapted from "Sharing Fencelines: Three Friends Write from Nevada's Sagebrush Corner," University of Utah Press, 2002.

I Am the Chicken

Jack Walther and the history of the sage hen. By Carolyn Dufurrena

It's March 2012 and Jack Walther is 93 years old, of sound mind, and still ranching. "Unlike some scientific people," he says, "I haven't researched the history of the sage hen. I *am* the history of the sage hen."

His first memory of the sage grouse was when he was a small boy in the 1920s. "There weren't an extreme lot of them then, but they were plentiful. We found them in the riparian areas. Well, we didn't have riparian areas then. We had grassy spots. We always found the sage hen by springs and along streams. They'd

so forth, a few ranch sheep. People are worried today about all these predators becoming extinct. In those days we worried about them making us extinct."

Jack knows that when there were a lot of cattle there were a lot of sage hen. "They were in good supply until the 1940s when they started increasing very fast until there were thousands of them. After the cattle would eat the riparian areas down, the sage hen would come in after them and pick the fresh green grass and the bugs around the cow manure.

least a quarter-mile or more, thousands of sage hen flew up and down into the hay meadow. Incidentally, they flew over the wire fence that runs along the ditch there. In all my years I never saw a sage hen killed in a wire fence, and I never heard of anybody who saw one either."

There are a lot of springs along the 30-mile stretch of road between Elko and Lamoille in northeastern Nevada. "We used to see a lot of sage hen out there, but now that's all housing development. We don't see any birds out there anymore. The habitat is gone."

Jack's familiar with all of Starr Valley and into Lamoille along the Ruby Mountains' edge. He talked to the Fish & Game people and the first thing they said was that crested wheatgrass is tough on the birds. "Well, we planted the first crested wheatgrass in the Lamoille area," Jack says. "Down where we planted it, there's a lek. It stayed there after we planted the wheat. The birds would come and strut there every year, and come drink at the spring on our property and eat the green grass. Later in the fall, the cattle would come in and eat the crested wheat around the water. The wheat would come back with a little moisture, and you'd find the sage hen there in the autumn in that green grass."

Jack has seen a lot of changes in his corner of the world. He's seen the sage grouse against the backdrop of generations of federal land managers and biologists. He's seen populations of predator and prey come and go. He's dealt with the evolution of government policy. He is mystified that U.S. Fish & Wildlife Service fails to admit or does not recognize that hunting and predation are significant threats to the sage grouse. "If sage hen are scarce," he reasons, "why are they still hunting them? Hunting is good. When you get too many birds they should be hunted, or disease will come in. Near Jiggs after the war, my brother saw more sage hen than anyone had ever seen, but each one he killed had tapeworms. He went back the next year to hunt and there were hardly any. Why can't hunting be allowed just where it's needed to control the population?"

Jack—a wise and caring elder—has a lot of questions for a man closing in on a century of observation of the natural world and its processes. He also has a great deal of knowledge that current specialists will dismiss as "anecdotal." What the government agents should realize is that responsible ranchers like Jack Walther just might be the best friends the sage grouse have. ■



Jack Walther has run or owned ranches that hug the Ruby Mountains for most of his long life. He and his wife Irene have never minded the endless work. Jack says, "People are worried today about all these predators becoming extinct. In those days we worried about them making us extinct."

come in on the meadows after haying."

Jack lived right up there in the high desert next to the Ruby Mountains and never saw a deer until he was 14 years old in 1933. "We'd see a track once in awhile, and we'd tell everybody for months we'd seen a deer track."

Back in the '20s, instead of putting a kid in jail for killing a hawk, a reward was offered. The extension agent in Elko sponsored a contest among the young people and gave a prize to the one who got the most points for predators and varmints: one point for a squirrel tail; a weasel tail you might get 20. "Everyone had gardens and chickens and

The riparian areas are fenced now to keep cattle out, and that's no good for sage hen. The grass is tall and rank and they don't have that tender feed they used to have. Then wildfire wipes the country out."

The sage grouse increased through the 1950s. Going into the 71 Ranch from Secret Pass south of Elko one day, on the left was an irrigation ditch and on the right was an alfalfa field. Jack saw sage grouse going in and getting a drink of water and lying up there in the shade of the brush along the ditch and feeding in the alfalfa fields. "Just as I drove in there, as if on signal, along the whole ditch at

Watch 'Em Dance

If you want to know about sage grouse, go sleep with Fred Fulstone's shepherders over a summer.

By Carolyn Dufurrena

Fred Fulstone peers out over a pile of papers in his Smith Valley ranch office. He may be 91 years old, but he hasn't lost a step. He and his daughter run the business part of the F.I.M. sheep outfit from his house. "We have 70,000 pages of stuff in the basement of this house," he says, documenting the history of his dealings with the federal government. He's had a lot of frustrations, and a few victories. "Western Watersheds recently dropped the appeal on my allotment management plan," he says with a smile. He remembers a time when things were different, before the data blizzard began.

Fred's grandfather homesteaded in the Genoa area between Carson City and Gardnerville, Nev. He came to Smith Valley in 1903. The outfit has run as many as 10,000 sheep in Smith Valley and in the Bodie Hills along the California/Nevada border. "During my youth, there would be as many as 50,000 sheep there, owned by several ranchers. Now I am the only one permitted to run there."

Fred grew up with the sage grouse, and he's watched them his entire life. "From the 1940s till the 1960s there were thousands and thousands of sage grouse in Smith Valley, the Bodie Hills. There was bumper-to-bumper traffic on the weekends as hunters came out from Reno to shoot them. The women here at the ranch would set up barbecues and, at the end of their day, the hunters would come over, the women would cook the birds and they'd have a big time. Now most of the sheep are gone, and most of the sage grouse are gone, too."

Fred takes me on a drive through the hills. We stop, and he kicks snow off a low shrub which he calls black sage. It's the primary diet for sage hen in the winter. "These leaves are half as long as they should be at this time of year," he says. "The winter moisture is what makes this sage grow, and we just haven't had much."

We head for the canyon that leads to the Bodie Hills, and the first thing I notice is that the juniper have truly taken over. "There were no trees in this canyon 50 years ago," he says. It's a juniper forest now. "These trees have taken all the water in these hills. There used to be a live creek in this canyon, and



PHOTOS © CAROLYN DUFURRENA



now there's nothing. The sage grouse would come in here every day to water." Fred has put in 40 or 50 troughs for his livestock, waters which also help the sage grouse. "We put little ladders in the troughs, so they can climb out if they fall in."

Shepherders live with the sage grouse, and a lot of those places you can't drive to, you have to take a saddle horse. "The sage grouse like

FROM TOP: Fred's office shows only a small part of the paperwork he has to contend with to satisfy the government. ► Fred worries that due to a mild winter in 2011-12 the black sage—the primary diet for sage grouse in winter—is looking weak. ► Fred's shepherders move a small flock to new pasture after lambing.



our sheep and often live within the bands. I tell those biologists if they really want to know about those birds, go out and sleep with my shepherders for a summer.”

Fred remembers seeing a sheep grazing along and it would put its head under the brush to eat where an old hen was sitting on a nest. “She might peck the sheep’s nose, but it wouldn’t bother the hen a bit. The newly hatched broods followed the band of sheep and came in onto the bed ground right after the sheep had left, to eat the insects left and the new plants regrowing.”

Sheep open up the canopy of vegetation and the sage grouse can move around and feed better. “The little birds will starve to death if you put them in big tall grass. They need forbs and dandelions and short tender grass.” It takes time to improve the habitat. Fred remembers a project in the ’60s in which he collaborated with the BLM to spray tall sage in the Bodie Hills. “It was too thick. We reseeded it, planted grass and forbs to improve the range, and it helped the sage hen, but that was 50 years ago.”

Fred thinks it’s a myth that tall ground cover protects sage grouse from predators. “The opposite is true. Sage grouse and other wildlife are better able to protect themselves when they can see predators coming. Coyotes and ravens have no problem detecting their prey, but they have trouble getting close enough. Dense cover lets predators get in close to their prey without being detected.”

Fred believes that predator control is a bigger issue than wildlife managers are willing to accept. “In the wintertime, sage hen dig burrows in the snow. The coyote smells that sage hen in her hiding place, digs a little, and he will reach in and grab those birds one after another.”

The biggest plus for sage grouse, starting in the 1920s, was when the federal government provided predator control. “They controlled the coyotes. We never used to have ravens. Now they fly with an airplane, but not too often. There are many, many more coyotes today, and they come in to the sheep at night. They didn’t do that in the past.”

At the end of the day, Fred Fulstone can’t understand why people are so fired up about these embattled gray birds. “Sage grouse are not that good to eat. In fact, they’re pretty rank. The only time it’s worth eating one is in the spring. People must just like to watch ’em dance.” ■

Call a Sheepman

The best way to save a wild bird. By Hank Vogler

*Kool-Aid tastes great
Glad I didn’t drink any
I can wait.*

Yes, in order to buy into the environmentalists’ argument of the greater sage-grouse, drinking the poison Kool-Aid or a frontal lobotomy or both is necessary to believe their commonsenseless premise. If the sage hen evolved during the Pleistocene period, wouldn’t things have been a lot tougher then?

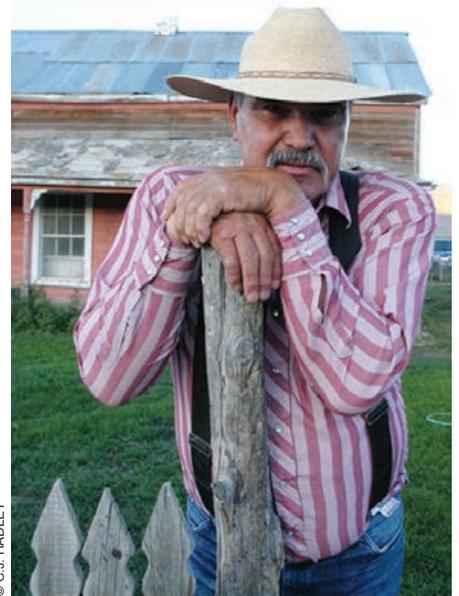
This is a ground-nesting bird. When it flies it doesn’t fly fast or far and would be a perfect meal of easy pickings for any predator, including man. The only large bird of edible size that is dumber would be the fool’s hen. The question that is haunting to this day is how did it survive without the Endangered Species Act?

Did it have a “nonaggression pact” with predators? Did the woolly mammoths act as the fire department like in a Disney movie? Did the Woolly Mammoth Fire Department keep the sagebrush steppe in perfect balance and harmony? Did the male in his puffed-up chest display scare off the short-nosed bears and the saber-toothed tigers? Did the great white buffalo lay down the law to other animals during the lek period and then forbid any animals to come near the nesting area?

It just gets scary to think that anyone would buy this argument. We have injected evil man into the equation and scream about habitat loss. Whatever happened to survival of the fittest? Most animals that roamed the earth were extinct long before the invention of the shotgun. Male bovine fecal matter must be taken in large doses.

When Cristobol Colon nearly found America, the sage hen was doing what it does best, and that is surviving in enough numbers that it supplemented the diets of many a predator. It cycled up and down in numbers without spotted-owl-Gore’s climate changes. When the biological survey came west to Nevada, they recorded seeing a few groups around present-day Eureka. I believe that was in the 1880s. I am sure that if the forty-niners ran into some sage chickens, they were invited to dinner but they didn’t write about it in their journals.

Nevada pioneer records show very little encounter with wildlife beyond the Jack Rabbit. Even further back when Peter Skene Ogden and friends wandered through Nevada, they made little mention of anything to eat. They did note that the beaver were so poor they made the men ill. They speculated that the beaver had a diet of water hemlock and little else. This was in the 1820s. There is little mention of sage chickens until ranchers



started irrigating hay meadows, fixing springs, and controlling predators to protect domestic livestock.

The sage grouse and other prey animals began to flourish. They had their ups and downs with drought and other natural phenomena. It is of record that during the dirty thirties in Elko County, Native Americans were hired by sportsmen to gather sage hen eggs so they could put them under domestic chickens to rear the chicks. The sportsmen were worried about losing their hunting. Still no sign of the ESA.

By the time I came along in 1949, the deer, the sage hen, and most other prey species were in a general uptrend along with cattle and sheep. The sage hen season was 30 days long and you could take six a day and 12 in possession. Every so many years they would get thick and die-offs would occur. A bad year would limit hunting and the birds would come roaring back. The reason was

because there were so few predators recruitment was huge. Many a time I witnessed the sky blacken with sage chickens flying off their feeding grounds. Strutting grounds were everywhere. You always took careful aim when hunting sage chickens as the old B-52 bombers were tougher than Katie Fite's vanity mirror.

Common sense shows that when sage chickens and mule deer and other prey animals were at their zenith, so were cattle and sheep. Man also had no restrictions on numbers or kinds of predators taken. Flying coyotes as well as bobcats, cougars, fox, badgers, hawks eagles crows skunks raccoons et al. were fair game. The Izaak Walton League used to have a predator contest with prizes for different predators and a point score for each. The larger predators got you more points. Total score wins.

When 1080 toxicant was outlawed in the early '70s, the paradigm shifted. The Endangered Species Act and the lack of using fur for coats contributed more than anything else to the loss of prey animals. The downward spiral of prey animals has continued until today. The anti-public-land-grazing elements are using the sage hen as a tool to destroy family ranchers. The same type of tool was used to destroy the timber industry in the Northwest in the 1990s. Logging families were destroyed in the name of the public good. Now overgrown brush has caught fire. Forests are full of weeds and diseased trees and fire danger has skyrocketed.

Now here we are about to repeat the same well-intentioned mistake. We have lost half the cattle and 93 percent of the sheep in Nevada, and now we have the sage hen tool to finish the job. The record shows that the sage hens' problem didn't start until the Endangered Species Act was enacted.

You want to save the sage hen, repeal the ESA. It has contributed to the decline more than any well-intended idea. Maps of eastern Nevada showing where the "experts" claim is critical habitat for sage hen are the grazing allotments of the last of the domestic sheep ranges. It encompasses all the sheep outfits in this part of the country. These areas have been continually grazed for more than 120 years. The sage hen must flourish in the presence of grazing sheep or they would surely not be where the domestic sheep are. We

"If we do not soon find animals we shall surely starve.... Did not see the trace of an animal and as the cold increases, I feel very uneasy regarding food. As the beavers do not lay up a stock of provisions for the winter, as is the case in cold countries, I hope the cold spell will soon pass; other wise how can they exist, as we well know without food we cannot."

PETER SKENE OGDEN, EXPLORER/FUR TRADER,
NEAR PRESENT-DAY DAYVILLE, OREGON
DECEMBER 22, 1825

must preserve the last of the sheepmen if we are to save the sage chicken. There is an obvious symbiotic relationship with domestic sheep and sage chickens or they long ago would have disappeared. You want sage chickens, call a sheepman.

Not only will the sage hen hurt the last of the family ranches and destroy local custom and culture, the mines are full of dis-

placed loggers and timber-industry folks run off by the spotted owl. They will be sucked into the mix no matter how much money the mine companies try to throw at the environmental groups trying to curry favor. When the injunctions and summary judgments and the studies and procrastination by state and federal agencies drag on for months while the miners have their homes foreclosed and all they can do is draw unemployment, the only bright spot in Nevada employment dulls and the tax

revenue to the state will plummet.

With all the negative things this tasty little bird will dredge to the surface, it might be a little dicey to drive a government vehicle through rural Nevada. ■

Hank Vogler raises sheep in eastern Nevada. He likes sage chickens. He helps sage chickens. And he wants to keep working his sheep.



Government Wildlife Services personnel took this coyote, which was carrying a dead sage grouse, in support of livestock grazing in Montana. A field necropsy revealed that it had already eaten 10 sage grouse chicks. OPPOSITE: Hank Vogler in front of the bunkhouse of his sheep outfit in eastern Nevada.

PHOTO COURTESY MONTANA STOCKGROWERS ASSOCIATION

The New Spotted Owl

History and threats. By J. Wayne Burkhardt, Ph.D., and Julie M. Burkhardt

While the spotted owl became the poster species for the destruction of the timber industry in the 1990s, the sage grouse is about to be used to restrict everything from livestock grazing to energy development and two-track trails across millions of acres of sagebrush in 11 western states.

HISTORY OF SAGE GROUSE POPULATIONS

The 2004 petition to list the sage grouse as endangered contained much rhetoric about vast, historic flocks. Much of the supporting agency documents and the recent BLM National Sage Grouse Planning Strategy simply repeats this rhetoric. Historic journals from presettlement times disagree. Lewis and Clark expedition journals indicate that they encountered sage grouse after they reached the upper Missouri River, and again at the mouth of the Snake River in the Columbia Basin of western Washington. The grouse they encountered earlier in the Dakotas and eastern Montana were probably prairie chickens, not sage grouse.

The Peter Skene Ogden journals from the 1824-1829 expedition through the heart of sagebrush country (northern Nevada, eastern Oregon, northern Utah, southern Idaho

and Wyoming) make no reference to sage grouse or "sage chickens" despite frequent comments on the difficulty of finding adequate food to support the expedition. The Workman expedition of 1830-1831 had similar difficulty securing game. Had there actually been vast flocks of sage grouse, as is now claimed, those birds would have been an easy and notable food source for the expedition.

The early accounts (1870 to early 1900s) of large numbers of sage grouse came after initial settlement of the West. This followed extensive livestock grazing that reduced the impact of fire (both Indian-set and wildfires) and set in motion a major West-wide shrub encroachment into previously more open, grassy ranges, which created much more favorable habitat for sage grouse and mule deer. At the same time, predator control in defense of livestock created more favorable conditions for sage grouse survival.

SAGE GROUSE THREATS

There are real threats to sage grouse populations in the western United States, and there are also presumed or assumed threats. The real threats are wildfire on winter ranges and subsequent invasion of exotic annual grasses, predation, and any large-scale expansive

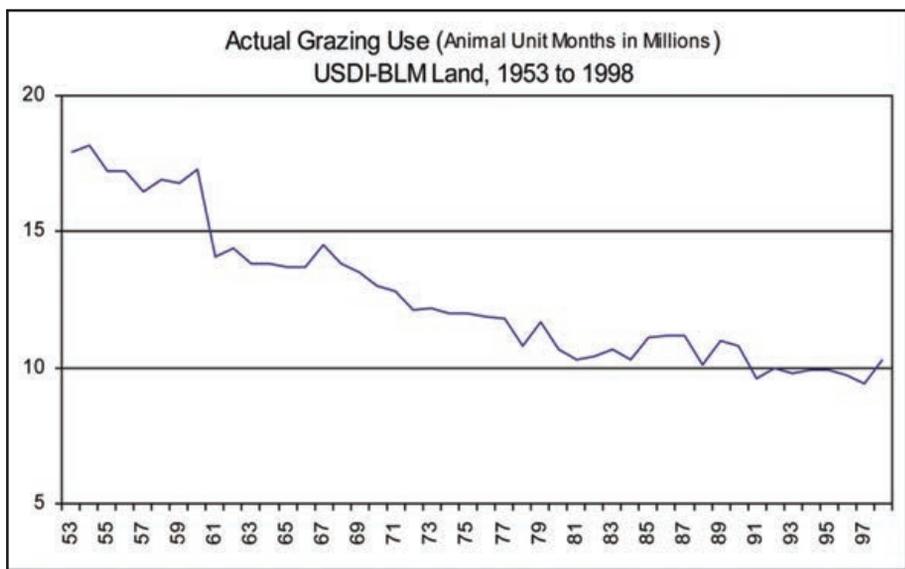
removal or conversion of native sagebrush vegetation. What follows are the four real threats to sage grouse:

(1) **Fires:** Wildfire in the drier parts of the sagebrush steppe (Wyoming big sagebrush plant community) has eliminated sage grouse wintering on hundreds of thousands of acres, representing most of its winter range. On these drier sites, fire encourages the establishment of exotic annual grasses, especially cheatgrass. Once established, cheatgrass forms dense stands which radically increase flammability, and result in more repeat fires with a frequency sufficient to halt sagebrush reestablishment. Without sagebrush, these areas are no longer suitable for sage grouse wintering ranges, nor do they provide spring nesting habitat.

Fire in the higher-elevation, mountain big sagebrush sites affects sage grouse summer brood-rearing habitat in a different manner. Lack of periodic fires in this vegetation type frequently results in overly dense brush or pinyon-juniper stands. Either of these changes reduces herbaceous understory plants, especially leafy forbs that are the main summer food source for juvenile sage grouse broods. In late summer, the many springs and riparian areas common to higher elevation ranges provide the necessary forb and insect food sources. In the absence of periodic fires, the increasing woody plant canopy also tends to reduce available groundwater needed to maintain important riparian zones to the detriment of sage grouse broods.

(2) **Predation:** There is a striking parallel response between sage grouse population changes since presettlement times and predator control post-settlement. Control in the form of government hunters, bounties paid by county game boards, rural kids with .22 rifles, and 1080 and M44 poisons all made a major impact on a variety of predators. This impact was West-wide and quite effective until the late 1960s when environmental concerns began to curtail the predator control programs.

Sage grouse populations that were scarce until the late 1800s expanded rapidly in response to favorable habitat conditions and predator control. These high populations were common until a slow decline began in the 1960s as predator numbers increased. Amazingly, almost all federal and state biologists continue to dismiss and disparage the idea that predators have a role in sage grouse population changes. In recent years, there have been several local studies and much



Several of the sage grouse conservation measures listed in the BLM's national strategy propose to restrict or eliminate land use or activities that in fact pose little or no threat to the game birds. It's no surprise to the people who live and work on the land that more cattle and sheep grazing on that land means more healthy populations of sage grouse. As livestock grazing diminished, so did sage grouse numbers.

anecdotal information that strongly suggest predation by ravens, coyotes and fox significantly affect local sage grouse populations.

In the 1980s, U.S. Fish & Wildlife Service (FWS) funded a study of raven predation on artificial sage grouse nests on the Sheldon Wildlife Refuge in northwestern Nevada. Ravens proved to be cunning and voracious nest predators. FWS biologists have estimated that raven populations in the West may have increased by a thousand percent since 1900. Landfill debris, highway roadkill, and man-made hunting perches have increased the ravens' food base, yet biologists, state game and fish departments and the FWS continue to insist that only habitat degradation has driven sage grouse declines.

(3) **Disease:** Another known threat to sage grouse is the West Nile virus, but activists dismiss this too as relatively unimportant. Sage grouse mortality due to West Nile is, however, well-known and certainly should be suspect in cases of rapid sage grouse declines in local populations.

(4) **Land Conversion:** Large-scale land development can disrupt sage grouse populations by completely removing habitat. High-density energy development with pipelines, roads and well pads can be problematic if a significant percent of the landscape's native vegetation is destroyed and human activity is constant. If existing cropland has any impact on sage grouse, it is a net positive. Sage grouse broods make significant summer use of green forage when private hay fields and meadows are adjacent to sagebrush habitat.

Land conversion to urban development does occur on some private land but rarely involves prime sage grouse habitat. The most significant conversion of sage grouse habitat occurring today is the result of wildfire on the bird's winter range. The only reasonably effective prevention measure within the land-management agencies' control is to maintain spring livestock grazing because grazing reduces fuel buildup of dry grasses. Ironically, livestock grazing restrictions and/or elimination is part of the proposed "conservation" measures in the BLM's new national sage grouse strategy. It is even more ironic because historic livestock grazing initiated vegetation successional changes that created the vast expanses of sagebrush country that became prime sage grouse habitat.

MISDIRECTED CONSERVATION MEASURES

Several of the sage grouse conservation mea-



© 2012, NEVADA HISTORICAL SOCIETY, ROBERT FULTON COLLECTION

Four hunters with sage grouse displayed on wagon wheels, ca. 1900. They had no problem finding birds.

"Early this day we Started our route was over a hilly Country & our progress very Slow for it was late ere we reached the River it certainly makes a great bend here for had the rocks permitted our following it we should have been two days in Coming round we Crossed over the river & encamped. Dis. 10 miles. Course south & South west. Our hunt this day amounts to 74 Beavers & a Pelican also taken in the traps it was rather a Strange Sight to us all to see one of the latter in these remote quarters for in fact with the exception of a few Bustards, we have so far not seen Birds or Fowls of any kind Save & except Ravens & crows in abundance & as for insects we have no Cause to Complain Fleas Wood lice Spiders & crickets by the millions."

PETER SKENE OGDEN, NEAR PRESENT-DAY PRESTON, IDAHO, MAY 2, 1825

sures listed in the BLM's national strategy propose to restrict or eliminate land use or activities that in fact pose little or no threat to grouse. Supposedly to reduce habitat fragmentation and sage grouse roadkill by vehicles, these conservation measures include closing dirt roads and two-track trails in pri-

ority sage grouse habitat and/or converting existing roads to "administrative use only."

The justification for these restrictions on public access and use of public lands is suspect. Seldom-traveled dirt roads hardly represent physical or psychological barriers to mobile wildlife species such as sage grouse.



In 1931, boxer Jack Dempsey enjoyed sage grouse hunting during a visit to Midas, Nev. There were plenty of birds, easy to find. This photo was probably taken on Squaw Valley Ranch a couple of miles from town.



Young Nevada hunters, left to right, Ashley Rife, Michael Nicholas and Jake Mattice of Yerington, and the rest of their hunting party found plentiful sage grouse near Wildhorse Reservoir in Elko County in 2011.

The idea that these roads fragment habitat in any biologically significant way defies reason and is almost laughable. Remember, birds can fly! Similarly, the concern over bird/vehicle collisions on these roads and trails is absurd since travel volume is low and travel speeds are slow. To any rational person, these hypothetical and highly unlikely impacts to sage grouse certainly are not adequate justification to restrict public use.

LIVESTOCK GRAZING

Several of the sage grouse conservation measures are apparently based on the assumption that livestock grazing is associated with sage grouse population declines. This ignores the positive role that historic livestock grazing had in creating favorable sage grouse habitat conditions through both vegetation successional changes that increase sagebrush and removal of predators. Also ignored is the parallel decline over the past half-century of both livestock numbers on public lands and the sage grouse population.

As noted earlier, historic journals indicate relative scarcity of sage grouse in the Intermountain West prior to European settlement (1820-1850), with apparently large flocks of sage grouse common from the 1870s to the 1960s, followed by a major decline to the present. Western livestock grazing began in the 1850s, with grazing pressure on the public domain estimated at 20 million AUMs (animal unit months) from 1880 to 1950, with a steady decline to the present time. Currently, fewer than 10 million AUMs are grazed on the public domain. These similar trends between livestock grazing pressure and sage grouse populations certainly do not suggest an adverse relationship.

Sage grouse management and grazing management share a common objective of healthy native rangeland vegetation, which is as important to range livestock production as it is to sage grouse. Conservation measures included in the BLM's national strategy—such as the retirement of grazing privileges, and the cancellation of grazing permits upon transfer—are based on political antagonism far more than real biology. Herbivory is a fundamental biologic process at the base of the terrestrial ecosystems' food chain. Range livestock grazing is based entirely on renewable natural resources and is far more environmentally benign than confinement meat production.

Properly managed range livestock grazing does not negatively impact sage grouse and it

maintains healthy native rangelands. Biologists' concern about livestock trampling sage grouse or their nests has no factual basis, nor does their concern about potential roadkill on dirt roads and trails. Any possible sage grouse mortality from either of these sources would be dwarfed by the annual loss of sage grouse to legal hunting, which is staunchly defended by sage grouse biologists.

Virtually all public-land grazing allotments are managed under some variation of rotations, utilization limits, stocking-rate limits, and seasonal rest periods of no grazing. These management tools, when properly applied, assure maintenance of native vegetation and good sage grouse habitat. Livestock on spring ranges are rotated through several pastures, thereby leaving one or more large

“Her people [Snake Indians] were reduced for want of food to subsist on the bodies of relations and children. She herself had not killed any one but had fed on two of her own children who died thro’ weakness. Unfortunate creatures what privations you are doomed to endure; what an example for us at present reduced to one meal a day, how loudly and grievously we complain; when I consider the Snake sufferings compared to our own!”

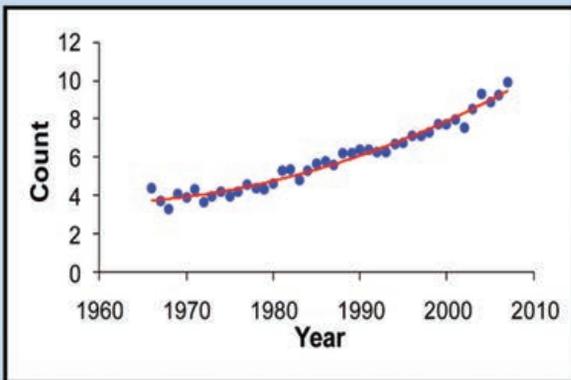
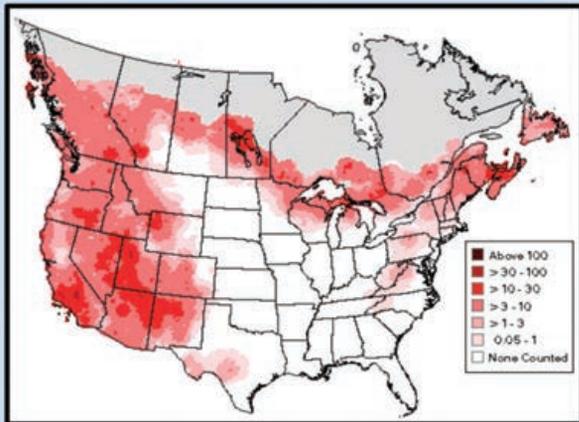
PETER SKENE OGDEN, NEAR PRESENT-DAY BURNS, OREGON, NOVEMBER 3, 1826

pastures ungrazed during the sage grouse breeding and nesting season. Utilization limits on herbaceous understory forage plants on the grazed pasture, along with sagebrush, generally also assure nesting cover.

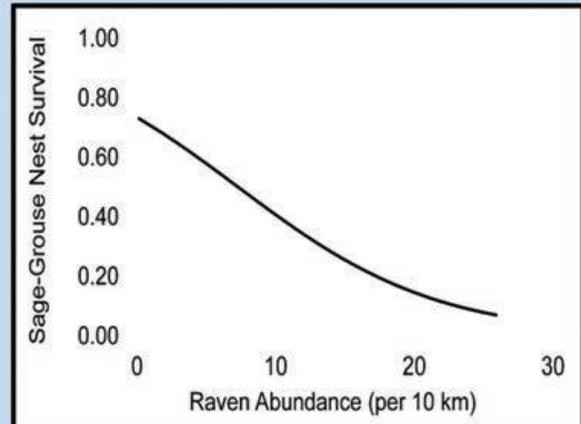
On summer brood-rearing ranges, livestock are managed under rotations that require periodic hot-season rest to maintain riparian vegetation that is critical forage for young birds. Off-site stockwater developments and salt and mineral placement also reduce grazing pressure on riparian areas.

Winter ranges are managed to maintain sagebrush and other shrub cover which is crucial for wintering sage grouse. Properly managed livestock grazing therefore poses no

Raven Populations are Increasing in Distribution and Numbers



Increasing Raven Numbers Impacts Sage-Grouse Nest Survival



Photograph credit: William Boarman

Raven numbers and distribution are expanding rapidly across the western U.S., based on data of a long-term, large-scale, international monitoring program known as Breeding Bird Surveys. Counts on the map and figure (top left) represent the number of ravens observed along survey routes. An increase in raven numbers contributes to lower sage-grouse nest survival based on a long-term nest survival study (top right) by USGS Western Ecological Research Center and Nevada Department of Wildlife.

threat to sage grouse, and, of course, poorly managed livestock grazing is indefensible for any number of reasons.

OTHER HERBIVORES

Herds of unmanaged large herbivores in high numbers can certainly pose a threat to healthy native range and to sage grouse habitat. As previously discussed, livestock are carefully managed while wild horses and big game (especially elk) are not. In contrast to managed livestock grazing, these herbivores graze yearlong on the range and are not confined to pasture rotation or herding, and there are no forage utilization limits.

The annual increase of livestock is completely removed from the range each and every year while the annual increase of horses and elk are only partially removed, if at all. The occasional BLM wild-horse roundups and big-game hunting seasons have certainly not prevented horse and elk populations from increasing West-wide. Excessive grazing



Two wild stallions fight for a mare. Excessive grazing pressure from horses and/or elk are negatively impacting sage grouse habitat. On summer brood-rearing areas, excess horses severely impact upland springs and riparian vegetation. On winter range, when heavy snow restricts access and animals are confined to more windswept, open areas, browsing can completely destroy sagebrush cover.



© DELIA NUFFER

This is Fred Fulstone's sheep country in western Nevada. "The sage grouse like our sheep," Fred says, "and often live within the bands." This dirt road and many others might, in future, be for "administrative use only." Some government agents and environmentalists are encouraging major restrictions against most activities on federally managed land even though they pose little or no threat to sage grouse.

pressure from horses and/or elk are negatively impacting sage grouse habitat. On summer brood-rearing areas, too many free-roaming horses severely impact upland springs and riparian vegetation. On winter range, when heavy snow restricts access and animals are confined to more windswept, open areas, browsing can completely destroy sagebrush cover. For example, elk concentrations on wintering areas like the Hardware Ranch in Utah or the winter ranges in western Wyoming have completely removed sagebrush from the plant community.

It is obvious that the agencies responsible for management of wild horses and big game are more interested in restricting or eliminating livestock on public lands than they are in properly managing the herbivores for which they are responsible. It is equally obvious that the sage grouse conservation effort is driven as much by political agendas and antagonism to public-land uses as it is by concern for sage grouse.

Like the spotted owl, the sage grouse faces no threat from traditional land use in the West. It is simply the latest tool of radical

enviros and their allies in government to attack traditional western land users. ■

J. Wayne Burkhardt, professor emeritus from the University of Nevada, Reno, holds a doctorate in range management. He has been working on the sage grouse issue for 30 years. His wife Julie has a bachelor's degree in range management. She is a noxious weed specialist and currently serves as chair of the Adams Soil & Water Conservation District in Council, Idaho. The Burkhardts run Ranges West consulting from Indian Valley, Idaho, and Ajo, Arizona.

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