The Progressive Rancher

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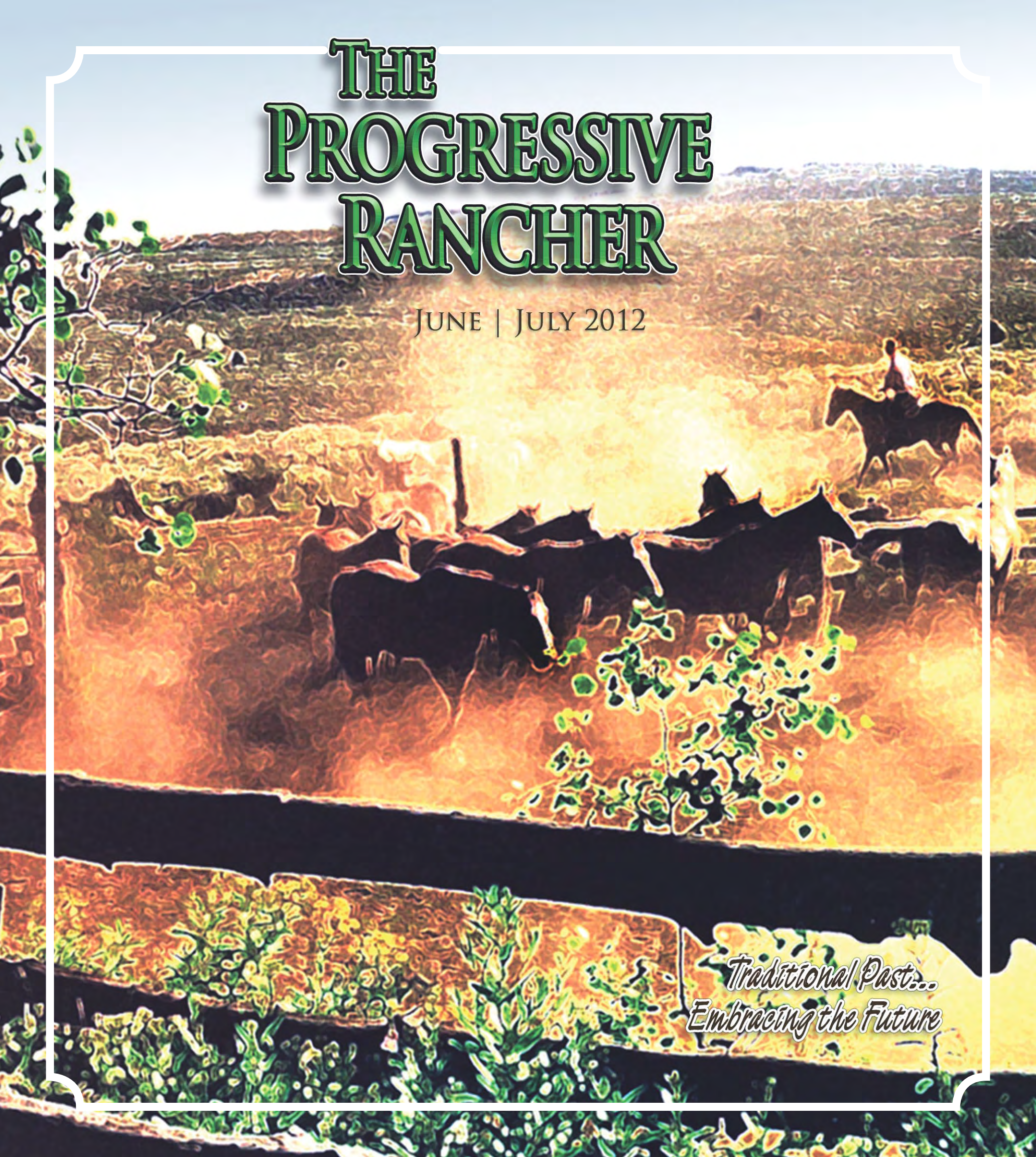

Traditional Past...
Embracing the Future

Toads, Humans, Sage Grouse and the Endangered Species Act

By David Spicer, Rancher and Miner from Beatty, Nevada

INTRODUCTION

Following is Part Two of a three part interview with David Spicer, a rancher from Beatty Nevada, who speaks of his experiences and actions when he faced the potential listing of an amphibian in his valley under the Endangered Species Act. He also owns and operates a mining company and formed the non-profit, STORM-OV, which is dedicated to keeping species from becoming endangered through cooperative programs and educational approaches. It stands for Saving Toads through Off-road racing, Ranching, and Mining in Oasis Valley. You can find out more on the web-site www.STORM-OV.org.

HOW DID YOU PROCEED? DID YOU SEE ANYTHING BEGIN TO CHANGE?

We started out here on the ranch demonstrating that our occupancy and use of it benefitted the toad. You have to remember that at first….grazing cattle, over-farming and over use of fertilizers and pesticides, mining, recreational driving and certainly off-road racing were at the top of the list as to why the toad was endangered.

We went straight ahead with our mining machinery, digging out and improving old springs that for centuries have been filling in with debris. After cleaning these waterways we restored their ability to produce clean water, basically forever.

After digging all the muck out, we backfilled them with crushed native stone, installed a drain system manifold, sealed the top with HDPE, established a water distribution pipeline to fill newly constructed breeding ponds, backfilled with native dirt, raked it out and grew toads.

All of this produced direct increases in the Amargosa toads' habitat and more importantly, their population. Here in the tri-property study, known as the Spicer, Mullin, and Torrance Ranches, we've had an 86% increase documented during the bi-annual cooperative "Toad Count", through 2009. And for 2010, continued increases again were documented; further demonstrations of our procedures being successful.

I was doing most of this work out of my own pocket to begin with. By this good faith act, individuals and agencies began to slowly realize that the actions we were taking were necessary. The violent excavation, the trucks rolling that were hauling all the muck away, the loaders digging….was hard to take, but when they saw tadpoles and toadlets, they became believers, and in some cases, advocates. All parties began to put emotions aside and look at reality. The reality was that the environment here no longer was producing the "cleansing" actions to keep the water sources open and that it hadn't been for a long time. No longer were there fires burning off the excess vegetation, no native Indians or ranchers engaging the springs, cleaning them to get a drink, no calamitous floods to gorge out the river bottom creating breeding ponds. The energy required to do these things, seemingly doesn't exist here anymore, in this part of the world. We were simply, replacing the lost energies of previous natural processes with mechanical ones.

> "We knew we stood wrongly accused. This was a challenge to take on, a wrong that needed to be righted. So we set to it."
>
> —Dave Spicer

We began forming our non-profit STORM-OV, Inc. in Sept, 2008, and officially filed our Articles of Incorporation in February, 2009. As the process of habitat reconstruction moved forward, so too, did the number of participants in this action. Some of the agencies told us that there were grants and funding available and that they wanted to help. Many other industries made important donations. We realized that we had not only increased the population of the Amargosa toad, but had also created a compelling force that everyone wanted to join and participate in. This has truly been the accomplishment, bringing the public, private sector, environmental groups, county, state, and federal agencies together; a task not easily done in the litigious atmosphere of the Endangered Species Act.

We started our non-profit STORM-OV (saving toads through off-road racing, ranching, and mining, in Oasis Valley), after many years of on- going individual efforts. We modeled our ranch and its resources into a "Toad Farm". We knew to answer the requirements of ESA we needed to increase the population of toads. Who better to do this than a farmer or rancher. We can make anything grow, anywhere. Just look at our existence in this desert we live in. We proudly told every official that we didn't need the government's fist telling us what to do....we were capable of doing what was necessary ourselves. We demonstrated increased water through spring reconstructions. Ran pipelines out to critical areas. Provided exclusionary fencing so livestock could be rotated in and out. Built new reservoirs, created new habitat and "directly increased the population of the Amargosa toads". All of it out of our own pockets, all on our own land.

We realized that our progress had to be up-scaled, enlarged, shared, if you will. All of our success had been on our own ranch, our own land. It was spectacular, no one denied that. But it was our success, driven by us, managed by us. And it was subject to our whims and desires. I was reminded of this one day by my good friend Brad while we were patting ourselves on our backs. He said, "Dave, we're winning the battle against the environmentalists trying to list our toads, but no matter what we do, it's still on our land, we could sell it and it could become a Wal-Mart parking lot tomorrow. We've impressed ourselves and those close to us but have we affected the lawsuit?"

All of us are living under the threat of the environmental lawsuit every day. We have to remember the government, not us, gets sued for failure to protect the species that live mostly on our land. And the proof of whether or not its listing is warranted falls squarely on the back of the government. They have to gather the data, study the habits, evaluate the threats and do species counts during the evaluation process. This process can take decades; all on our land, all at the expense of us taxpayers without the benefit of the accusers' participation. Nowhere else in our judicial system does something like this exist. Only the ESA allows the plaintiff (accuser) to make

USFWS Photo.

its accusations as its only contribution to a lawsuit, then sit back in full enjoyment while the defendant (that's us taxpayers), bear the full costs and proof of burden. We the people are funding the government to defend itself against lawsuits wherein it created laws allowing itself to get sued, that if it loses, it enforces against us. Us landowners, us taxpayers, us citizens. What the hell have we done to ourselves?

As insane as this sounds, so it must have appeared to some within the government. From our entry point into our struggle in 1994, things have changed. At first, all we heard was what we were going to have to do, or how we'd have to manage our land, once the toad was listed; there weren't many tools in the box usable or palatable to us landowners. The big one we choked on was where you sold your farm to the government, you could live there the rest of your life with little change, but when you died they got it, not your family or children. We were told this was a good way to protect your property, that this process and similar ones were what was needed to demonstrate our willingness to protect our endangered species. Or we could start a fund by charging any landowner a fee for new disturbances which then could be used for habitat enhancement at some undisclosed place or time. Needless to say, none of this stimulated anyone to do anything. Our meetings began to deteriorate into frustrating experiences of increasing numbers of government specialists and diminishing numbers of landowners. All of us just wanted to make a living from our land like our fathers and grandfathers before us.

Somewhere in that time, things like the Partners Program, the Landowners Incentive Program, the Noxious and Invasive Weed Program, and adaptations of Farm Bills' aid to assist in protection of potentially endangered species began to show up. A movement away from instant and final enforcement was occurring. A desire to mitigate the plight of the landowner was apparent. New faces began to show up, friendly ones without guns and badges. They were carrying potential funding deals with them. Deals that could help us on our ranches, making them more productive as long as we could "demonstrate" how this helps the environment. It was up to us to figure this out. Draft and design up an idea, do some engineering, follow it with a cost analysis———-show its value. Add in some matching funds....and wah-la you're saving something. The only commitment required was that you maintain the enhancement for 5-10 years or so. At the end of it, your commitment is over; you still own the land.... no sneaky stuff. A whole new way of thinking. A much needed and necessary change in the way landowners were treated. Respect had been re-established. Recognition of land owners' rights was being practiced. We celebrated these new approaches, jumped at the opportunities, and worked to cause them to happen. My relationship with my government now was meaningful, not confrontational.

We had created trust between us. A willingness to commit and cooperate grew on all sides. How could we not get involved? These deals were not with The Devil anymore, we weren't selling our souls. We were saving our lifestyles, our right to ranch, preserving our futures, and protecting the environment we live in. Making the differences between the environmentalist and ourselves dissolve by creating these partnerships and conservation actions on our properties. Giving not only ourselves some peace but also relief to the government from the lawsuits it faces. All of us together have to do this. Gather around the idea that it can be done.

The payoff is watching the divide that exists between us crumble. Changing the idea that we land owners and users and our relationship to other species does not exist as Violator and Victim. To have brought opposite sides together, on the one side farmers, ranchers, miners, racers – America's Land Users; on the other, environmental groups and their law firms. And last but not least, the target of petitions and legal actions....the U.S. government and many of its agencies, all brought together into a joint effort. One that we land owners are at the center of, demonstrating that further diversification of our land and resources benefits all creatures. That a hands off approach does not work. To replace accusations and blame with praise and reward. To find a solution to the problem of us landowners taking the full brunt of the responsibility. Awakening everyone to this fact and getting cooperative efforts occurring. Ultimately to maintain freedom on the land we own and use, making it financially and environmentally productive.

By committing and improving parts of our land, then getting involved in partnership agreements, land incentive programs, USDA farm bills, and other state and federal programs, we've kept the Wolf away. In these programs, the grants and funding that they've provided have gone a long way in adding to the productivity of our practices as well as adding important wildlife increases. One could say this is an important revenue stream for farm and ranch improvements we could not otherwise afford. Our work also stimulated other industries to commit time, money, and energy into the message of the voice we now have.

The people I have worked with within the government as well as other environmental non-profits have become my friends and they have my respect for working as hard as I have in keeping things off the endangered list. Many long nights in the wind and rain have been spent away from home with volunteers they managed to motivate, counting our toads, catching them, tagging them, measuring them.... much of it on their own time. All of this done to keep a lawsuit away from us. To keep themselves and us from becoming targeted as a failure to take care of the world we live in; putting sense and meaning into all of our efforts.

It does not escape me that if these efforts are not genuine and productive, we fall back under the looking glass. That the power of the Endangered Species Act has not diminished and our relationship with our government can quickly slide from the cooperation we have now into an enforcement action for the ESA. Really, this is no different than the democracy we live in and the freedom it affords us. The price of it is constant vigilance.

> Society for Range Management literally wrote the book on Coordinated Resource Management (CRM) back in 1993. Today the groups that meet voluntarily to solve problems for resource management issues are called collaborative, which is a stakeholder consensus decision-making process. Stakeholders are any interest with a stake in the consequences of the decision. In this process, the stakeholders make decisions by consensus, rather than by traditional voting and majority rule. The original "CRM Guidelines" by Rex Cleary and Dennis Phillippi state, "It is also our belief that these thrusts must be done first at the local level. Local response to changing times and conditions must occur before anything substantial and enduring can be accomplished. In other words, 'if the local people don't agree, then you have a conflict and/or a stalemate' in the making."

USFWS Photo.

The Society for Range Management (SRM) is "*the professional society dedicated to supporting persons who work with rangelands and have a commitment to their sustainable use.*" SRM's members are ranchers, land managers, scientists, educators, students, conservationists – a diverse membership guided by a professional code of ethics and unified by a strong land ethic. This series of articles is dedicated to connecting the science of range management with the art, by applied science on the ground in Nevada. Articles are the opinion of the author and may not be an official position of SRM. Further information and a link to submit suggestions or questions are available at the Nevada Section website at http://nevada.rangelands.org/. SRM's main webpage is www.rangelands.org. We welcome your comments.

The Greater Sage-Grouse Does Not Warrant Listing Under the Endangered Species Act

A White Paper prepared for the Elko County Commissioners by Western Range Service on May 12, 2012

Introduction

Numerous petitions to the US Fish and Wildlife Service (FWS) requesting that the greater sage-grouse be listed under the Endangered Species Act (ESA)[1] brought one question to the forefront, should the greater sage-grouse be listed as endangered or threatened? Many believe that the answer is a settled "Yes" based upon the March 23, 2010 FWS Findings[2] which concluded that "listing the greater sage-grouse (rangewide) is warranted, but precluded by higher priority listing actions." See FWS Findings[2], page 13910.

However, a thorough review of all the information presented in the FWS Findings demonstrates that the FWS conclusion that the greater sage-grouse is warranted for listing is not supported by the best scientific and commercial data that was considered in their analysis. The purpose of this paper is to revisit the question in light of all of the data that was presented in the March 23, 2010 FWS Findings.

Should the greater sage-grouse be listed as endangered or threatened?

Any answer to this question must be consistent with the primary purposes of the ESA and its definitions of endangered and threatened species. The ESA states that the primary purposes of the Act are to: 1] "provide a means whereby ecosystems upon which endangered species and threatened species depend may be conserved" and, 2] "provide a program for the conservation of such endangered species and threatened species" (see ESA, Sec. 2(b) Purposes).[1] Since these purposes apply specifically to "endangered species and threatened species" a finding that a species is either endangered or threatened must occur before a species, or the ecosystem (habitat) upon which it depends, falls under the purview of the Act.

By definition under the ESA, an "endangered species" is "any species which is in danger of extinction" and a "threatened species" is "any species which is likely to become an endangered species within the foreseeable future" (see ESA, Definitions, Secs. 3(6) and 3(20)).[1] Thus, under the ESA, a species can only be listed as endangered if it faces imminent extinction, or as threatened if it is at risk of extinction in the foreseeable future.

Given the different definitions for an endangered species and a threatened species under the ESA, the initial question (Should the greater sage-grouse be listed as endangered or threatened?) becomes two distinct questions. First, does the greater sage-grouse face imminent extinction and therefore warrant listing as an endangered species? Second, is the greater sage-grouse at risk for extinction in the foreseeable future and therefore warrant listing as a threatened species?

Does the greater sage-grouse face imminent extinction and therefore warrant listing as an endangered species?

In order to address this question, it is necessary to know the minimum effective population of greater sage-grouse needed to maintain long-term genetic diversity and safeguard the species from the risk of imminent extinction. The US Fish and Wildlife Service's analysis in their March 23, 2010 FWS Findings identified geographically isolated greater sage-grouse populations of fewer than 50 breeding adults as being at short-term risk of extinction, and identified geographically isolated sage-grouse populations of fewer than 500 breeding adults as being at long-term risk of extinction (see FWS Findings, page 13959).[2]

The FWS Findings further reported "a minimum effective population size must be 5,000 individuals to maintain evolutionary minimal viable populations of wildlife" (see FWS Findings, page 13959).[2] With respect to greater sage-grouse in particular, the FWS

Findings reported "up to 5,000 individual sage-grouse may be necessary to maintain an effective population size of 500 birds" because of comparatively low reproductive rates, a highly polygamous mating system, individual male breeding success, and juvenile death rates (see FWS Findings, page 13985).[2]

The current estimated population for greater sage-grouse exceeds 535,000 birds (see FWS Findings, Table 4, page 13921),[2] which is 107 times greater than a minimum effective population of 5,000 birds. The FWS Findings express concern that many greater sage-grouse populations have already fallen well below a population of 5,000 birds, potentially compromising their genetic diversity (see FWS Findings, page 13985).[2] However, for purposes of determining if greater sage-grouse are endangered, the question is not if there are any geographically isolated populations that fall below 5,000 birds, but rather if there is a geographically connected population (to allow the free exchange of genetic information) that exceeds a minimum effective population of 5,000 birds. If a single geographically connected population exceeding 5,000 birds exists, the species as a whole does not face imminent extinction, and thus does not legally qualify as "endangered" under the ESA.

The FWS Findings identified two strongholds of contiguous sagebrush habitat for greater sage-grouse, the southwest Wyoming Basin (southwest Wyoming and northwest Colorado) and the Great Basin (straddling Idaho, Oregon, and Nevada) (see FWS Findings, pages 13950 and 13962).[2] These stronghold areas contain high densities of breeding males and sizeable greater sage-grouse populations that have been maintained even under the alleged existing threat factors, and these are expected to remain strongholds in fifty years (see FWS Findings, pages 13962, 13986, 14008, and 14009).[2]

These stronghold areas are each projected to currently support greater sage-grouse populations that are at least 10 times larger than a minimum effective population of 5,000 birds, and are each projected to maintain populations that are at least 5 times larger than the minimum effective population in thirty years if existing and anticipated threat factors continue without constraint. Thus, there are at least two discrete greater sage-grouse populations that currently greatly exceed a minimum effective population of 5,000 interbreeding birds, and they are expected to continue to greatly exceed such a minimum effective population over the next thirty years, so the species does not face imminent extinction and does not legally qualify as "endangered" under the ESA.

Is the greater sage-grouse at risk for extinction in the foreseeable future and therefore warrant listing as a threatened species?

The FWS Findings reported contemporary rates of decline for greater sage-grouse estimated by several sources. Connelly *et al.* 2004 estimated the rate of decline from 1986 to 2003 to average 0.37% per year, and reported that some populations actually increased during that period (see FWS Findings, page 13922).[2] At that rate of decline, it would take more than 1,260 years for the estimated current greater sage-grouse population to dwindle to a minimum effective population of 5,000 birds rangewide, and it would take more than 1,060 years for each of the stronghold areas to fall below a minimum effective population of 5,000 birds. In contrast, WAFWA 2008 estimated the rate of decline from 1985 to 2007 to be 1.4% per year (see FWS Findings, page 13922).[2] At that rate of decline, it would take more than 330 years for the estimated current greater sage-grouse population to dwindle to a minimum effective population of 5,000 birds rangewide, and it would take more than 280 years for each of the stronghold areas to fall below a minimum effective population of 5,000 birds.

Speculating about what might occur 280 to 1,260 years from now reaches into the remote future, well beyond the foreseeable future. The greater sage-grouse is not at risk for extinction in the foreseeable future, so is not legally qualified to be listed as "threatened" under the ESA.

The greater sage-grouse is not warranted for listing as endangered or threatened.

As discussed above, the greater sage-grouse is not faced with imminent extinction and is not at risk for extinction in the foreseeable future, so is not legally qualified to be listed as either "endangered" or "threatened" under the ESA.

The FWS Findings' conclusion to the contrary (finding that the greater sage-grouse is warranted for listing rangewide) is not supported by the best scientific and commercial information disclosed therein. The conclusion that listing is warranted also conflicts with subsequent estimates that such a listing would require ESA restrictions to be imposed within the 75% breeding density area which accounts for approximately 400,000 birds within 27% (50 million acres) of the currently occupied greater sage-grouse range (186 million acres) (see Doherty et al. 2010, page 2).[3]

If the greater sage-grouse were really rare enough to warrant listing under the ESA, it is unconceivable that its population could be so numerous and widespread that the listing would require protection of more than 400,000 individual birds across a swath of land covering over 50 million acres. Given that greater sage-grouse are so numerous and well distributed, and are projected to persist so far into the future under existing circumstances, it is nonsensical to classify the species as endangered or threatened.

Other Concerns

The FWS Findings attempt to justify their warranted but precluded finding based upon several other concerns, including population trends, habitat fragmentation (primarily due to oil and gas development in the Wyoming Basin and interrelated wildfire and spreading invasive plant communities in the Great Basin), and adequacy of regulatory mechanisms to protect greater sage-grouse. However, the cumulative impact of all of these concerns is addressed in the above described analysis regarding the minimum effective population needed to safeguard the greater sage-grouse from imminent extinction and the risk of extinction in the foreseeable future.

Thus, regardless of the seriousness of these concerns, they do not rise to the level, singularly or in combination, to result in a need to list the greater sage-grouse under the ESA. Since the greater sage-grouse is not legally qualified to be listed as either "endangered" or "threatened" under the ESA, any perceived need to address these concerns regarding sage-grouse management cannot be compelled under the color of the ESA.

Population Trends

The FWS Findings admit that greater sage-grouse "numbers are difficult to estimate due to the large range of the species, physical difficulty in accessing some areas of habitat, the cryptic coloration and behavior of hens (Garton *et al.* in press, p. 6), and survey protocols" and ultimately conclude "since neither presettlement nor current numbers of sage-grouse are accurately known, the actual rate and magnitude of decline since presettlement times is uncertain." See FWS Findings,[2] pages 13921 and 13923.

Despite the recognition that the rate and magnitude of change in greater sage-grouse populations over time is uncertain, the FWS Findings assume that greater sage-grouse populations have significantly declined from pre-settlement populations based primarily upon conclusions from several sources indicating that "sage-grouse population numbers in the late 1960s and early 1970s were likely two to three times greater than current numbers". See FWS Findings,[2] page 13922. Note that the cited high populations in the late 1960s and early 1970s tell us nothing about pre-settlement numbers. The FWS Findings report that "three groups of researchers using different statistical methods (but the same lek count data) concluded that rangewide greater sage-grouse have experienced long-term population declines in the past 43 years, with that decline lessening in the past 22 years." See FWS Findings,[2] page 13923. These recent historical observations are consistent with testimony of Nevada residents that have first-hand memories dating back that long ago, or earlier, some as far back as the 1930s. But again, looking back 43 years, or even 80 years, tells us nothing about pre-settlement greater sage-grouse numbers.

The FWS Findings ultimately conclude "(a)lthough the declining population trends have moderated over the past several years, low population sizes and relative lack of any sign of recovery across numerous populations is troubling." See FWS Findings,[2] page 13987. But this conclusion is based primarily upon the observed greater sage-grouse population declines from the high numbers in the 1960s to today, which cannot be used to establish how current greater sage-grouse populations compare to pre-settlement populations. Yet, based primarily upon estimated populations at these two points in history, the FWS Findings assume a relatively linear trend line for sage-grouse populations, and thus presume that pre-settlement greater sage-grouse populations were abundant.

The FWS Findings claim that "(e)arly reports suggested the birds were abundant throughout their range" and estimate that historical populations ranged from 1.6 million to 16 million birds. See FWS Findings,[2] pages 13920 and 13921. They then look forward in time and forecast that without regulatory intervention, a persistent downward trend will continue into the future, and sage-grouse populations will eventually reach levels near or below the minimum effective population, putting the species at risk for eventual extinction. They seem oblivious to the fact that at the maximum estimated contemporary (1985 to 2007) rate of decline of 1.4% annually (see FWS Findings, page 13922)[2] it would take over 330 years for the estimated current greater sage-grouse population to dwindle to the minimum effective population of 5,000 birds, a time frame that reaches way past the foreseeable future.

The greater sage-grouse population trend assumed by the FWS Findings is depicted graphically by the dashed grey trend line in Figure 1 on page 11 [*Progressive Rancher page 22*] herein. The downward trend between the 1960s and today is assumed to be relatively steep due to rapid agricultural conversion of sagebrush habitat starting in the late 1960s. Except for a period of accelerated decline associated with commercial hunting in the 1930s, the downward trend in greater sage-grouse populations is projected to extend back in time prior to the 1960s at a somewhat slower rate of decline.

Likewise, the downward trend in greater sage-grouse populations is forecast to continue into the foreseeable future, at a slightly slower rate. This forecast leads to the conclusion that greater sage-grouse populations will eventually reach levels near or below the minimum effective population (as high as 5,000 breeding adults), putting the species at risk for eventual

extinction. See the dashed grey trend line depicted in Figure 1, pg. 11 [*Progressive Rancher page 22*] herein.

However, we know from documented sources that the assumed higher greater sage-grouse population levels in the early and mid 1800s depicted by the dashed grey trend line are simply wrong, at least with respect to known greater sage-grouse population levels at various points in the recorded history of the Great Basin. Greater sage-grouse within the *Western Region*, particularly the Great Basin, were scarce during the pre-settlement period, much less abundant than today. Ira Hansen, Nevada State Assemblyman, prepared a report (available from Western Range Service upon request) regarding pre-settlement greater sage-grouse populations throughout Nevada and the Great Basin based upon written accounts of early explorers in the region. Those early written accounts indicate that between about 1820 and 1850, greater sage-grouse were uncommon, being observed only rarely by the explorers, and were seldom included in the diets of the Native Americans due to the scarceness of the bird.

Similarly, in Part III of the King Exploration Report (King)[4] based upon field-work from June 1867 to August 1869, Ornithologist Robert Ridgway reported "birds characteristic of the sage-brush are not numerous, either as to species or individuals, but several of them are peculiar to these districts;" including *Centrocercus urophasianus* (greater sage-grouse). See King,[4] page 324, underlined emphasis added. Regarding greater sage-grouse, Ridgway reported "(a)lthough this large and well-known Grouse was met with throughout the sage-brush country between the Sierra Nevada and the Wahsatch (sic), we saw it so seldom that little was learned of its habits, particularly during the breeding-season." See King,[4] page 600, underlined emphasis added.

Lest anyone assume that sage-grouse were seldom seen during these explorations because the vegetative cover was significantly heavier than it is today, and thus allowed the birds to better hide themselves, consider Ridgway's following characterization of the sage-brush communities under the section titled *Birds of the sage-brush* (see King, page 323).[4]

> The term "sage-brush" is the western vernacular for that shrubby growth which prevails over the valleys, mesas, and desert mountain slopes of the Great Basin to the utter exclusion of all other vegetation, except in isolated and extremely restricted places. One species, the "everlasting sage-brush" (Artemisia tridentata), composes by far the larger part of that growth, "covering valleys and foot-hills in broad stretches farther than the eye can reach, the growth never so dense as to seriously obstruct the way, but very uniform over large surfaces, very rarely reaching to the saddle-height of a mule, and ordinarily but half that altitude."

The forecast that greater sage-grouse populations will continue to significantly decline into the foreseeable future also appears to be wrong based upon recent studies within the Great Basin. Nevada Department of Wildlife Studies report that greater sage-grouse populations increased within the state from 2008 through 2010. A complete picture of Great Basin greater sage-grouse numbers since written records began indicates:

1] pre-settlement populations were low, far less than today, but well scattered;
2] populations dramatically increased between the late 1800s and early 1900s;
3] populations peaked in about 1930 and remained high through the 1960s (perhaps interrupted by a moderate dip due to commercial hunting);
4] populations declined rapidly from the 1970s through about 2000; and,
5] populations declined more slowly from 2000 through 2010, and have even increased during the last part of this period in certain locations.

Figure 1 on page 11 [*Progressive Rancher page 22*] herein displays these circumstances graphically. All available information regarding estimated Great Basin greater sage-grouse numbers from the early 1800s to present is shown as triangular data points in Figure 1, connected by a smoothed black line. To determine the overall direction of change in Great Basin greater sage-grouse populations over time, a linear trend line[5] for the Great Basin data is depicted in Figure 1 as a solid grey line, which increased over time. This is the exact opposite of the assumed downward trend predicted by the FWS Findings based upon the period between the 1960s and the present. It is unreasonable to base conclusions regarding long-term population trends only upon knowledge regarding population levels at two points in history, 1960 and today, when we have knowledge regarding sage-grouse populations at other times.

When interpreting graphic representations of data like that presented in Figure 1 on page 11 herein, it is helpful to develop biologically relevant explanations for the points where the population curve significantly changes slope or reverses direction. The population trend explanations suggested by the FWS Findings have the potential to explain only two of the deflections shown in Figure 1 for Great Basin greater sage-grouse populations. Commercial hunting could explain the population decline depicted in the 1930s, and agricultural conversions may partially explain the alleged "rapid" population decline beginning in about 1970. However, agricultural conversions were taking place as early as the turn of the century,

Figure 1. Historic Greater Sage-Grouse Population Trends