Stephen B. Monsen

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Western Turf Wars: The Politics of Public Lands Ranching

As a descendant of Mormon sheep ranchers who helped settle Utah in the 1850s, Steve Monsen would have continued in the family profession had not his father persuaded him to attend college. Consequently, Monsen went on to pursue graduate study at Brigham Young University in botany and range science and then joined the Utah Fish and Game Department. In 1968 he began work at the USDA Forest Service's Intermountain Research Station (later renamed the Rocky Mountain Research Station–Shrub Sciences Laoratory) at Provo, Utah, where he participated in many rangeland restoration projects until his retirement in 2002. He received the Society for Range Management's Outstanding Achievement Award in 1991.

Steve Monsen made his remarks on the 5th of August 2004 in Mapleton, Utah.

Chapters

CHAPTER 1

Monsen's early years

I was born and raised in Sanpete County, in a little community called Mount Pleasant, which is located in central Utah. My family were original settlers, coming into the area in about 1850. Both my grandparents were livestock operators as were many people. They farmed some also. And they both eventually developed rather large herds, particularly of sheep.

I grew up working in the ranching scene and I actually started herding sheep when I was about thirteen. So I became interested in aspects of range and livestock operation, and I enjoyed

that. And I was inclined to follow that as an occupation, but my father didn't feel that was the thing for me to do. He wanted me to go to college. And I had plenty of opportunity. So I enrolled in a junior college in Ephraim, Utah, where the Great Basin Research Station is located.

I actually had accumulated a small band of sheep. And when I graduated from high school my intent was to add to that and to buy property. But my father encouraged me to go to school and he told me that if I did he'd take care of the animals for me. He was an excellent herdsman and I had plenty of confidence that he'd do that.

Well, I'd been in school for only two or three weeks when I happened to come home and discover that the sheep were gone. Of course, I asked him what had happened to them.

And he said, "I sold them. I'm not gonna give you the money unless you stay in school." And he did.

He gave me a little bit of money every week out of which I paid my expenses. And that made quite an impression on me. I recognized that perhaps he was right.

In any event, I graduated in agronomy and animal science, thinking that I'd like to teach vocational ag or something of that nature.

CHAPTER 2

Monsen's career in research

During my last year of college, I was approached by the Forest Service to see if I'd be interested in pursuing a master's degree by investigating some grazing issues in the Jackson Hole area of Wyoming. Elk grazing in and around the feed grounds and refuge areas was a concern. The Forest Service was interested in the changes that may have occurred with the plant communities.

I took that job and in doing so I became a seasonal employee with the Intermountain Experiment Station. The personnel that were funding and administering that study were also somewhat affiliated with the Great Basin Research Station in Ephraim. And so I went there and received some training to start the work in Jackson Hole.

Then as I returned each summer over a two-year period the scientists there invited me to come in and explain to them what I'd found. That's how I became even marginally acquainted with Forest Service research issues. And that really piqued my interest because I didn't see myself as a scientist, although I really liked the investigative aspects of understanding what was going on. And I seemed to enjoy that more than I did managing resources.

As I finished with that work, a job opened up at the Great Basin Station as an employee of the Utah Fish and Game Department. They had a cooperative study going with a research branch of the Forest Service. The project was led by A. Perry Plummer,[1] a Forest Service scientist with whom I'd gotten acquainted.

In any event, I was hired then. And I started working at Ephraim in about 1960 as an employee with Utah Fish and Game Department. I was assigned to the Shrub Improvement and Revegetation Project, which had started two or three years earlier to investigate and develop techniques for restoring big game ranges.

1. A. Perry Plummer (1911–91): teacher, naturalist, range scientist; recipient of the Society for Range Management's Outstanding Achievement Award (1974) and the organization's designation of Fellow (1978).

The project had a two- or three-fold objective. One was to collect and bring into use some of these key woody species. Obviously, we had to learn about the agronomic aspects of those plants: their seed production, flowering habits, seed germination. How do you go about creating desirable seedbeds? How can you seed these plants in combination with others? And how can you restore complexities of vegetation?

Much of the early work was directed toward understanding the biology of individual shrubs and understory species. We began working on techniques and equipment to reduce competition, create a seedbed and then seed large areas. We established studies to investigate the success of those treatments, both initially and over the long term.

I worked there for about ten years before transferring to Forest Service Research in Boise, Idaho, on a watershed project. My responsibility there was to alleviate and correct some of the enormous problems that had been created by logging in central Idaho beginning in the 1960s. And that again was a major challenge.

I was on that project for about three years when the Forest Service reorganized, and everyone dealing with plant restoration was assigned to the shrub project in Ephraim. So I was back on the Ephraim project, but detailed to Boise.

I continued to work in watershed related problems in Idaho, but then I quickly expanded into range and big game habitat issues there as well. Much of the work that we were doing in Utah was then carried over into Idaho and other parts of the West.

Then as the cheatgrass[2] issue throughout the West became more of an issue, I slowly gravitated to working more on that in the semi-arid and arid sites.

I transferred to the Provo Shrub Lab in 1983 where I continued with the work in Idaho and elsewhere throughout the West.

Mr. Plummer had work going on at the Great Basin Station that had begun there about 1910. And he was very interested in the changes in plant communities that had occurred over that hundred year period of time. I remained, as much as I could, involved in following up on some of those long-term studies.

I was then instrumental in establishing the Great Basin Initiative and the work that's now being funded through BLM and Forest Service on a huge native plant program for the Great Basin and the West.

Since retiring in 2002, I have been working as a consultant in many of these areas.

I identified the areas of work on the Great Basin Initiative that I felt should be pursued. And then, knowing I was going to retire, I was able to bring Utah Fish and Game scientists into the work, as well as some Forest Service scientists in Boise that I'd been working with. And then I insisted that they hire someone behind me.

I have also been involved with a similar effort in the Colorado River drainage. Before I retired, I was working with a group on an area they call the Uncompahgre Plateau. This included Forest Service, BLM, and Colorado Game and Fish Department personnel. They had organized

2. Cheatgrass (*Bromus tectorum* L.). Annual grass native to Eurasia; first introduced (intentionally or accidentally, depending on the source) to western North America in the late 19th century. Responsible for significantly reducing fire intervals on Western range. See http://www.stoller-eser.com/cheatgrass.htm (last visited 9 May 2008) and http://www.fsu.edu/~imsp/silent_invaders/new_weeds/guide/plants/cheatgrass/cheatindex.html (last visited 9 May 2008) for more information.

themselves several years ago into a group they referred to as the "UP team" for the Uncompahgre.[3] And they were interested in trying to rectify disturbances that have occurred, particularly on the Uncompahgre Plateau. They were equally interested in restoring the native vegetation—to try and correct sage-grouse[4] habitat as well as big game habitat. So I have helped them, and we have put together an ongoing native plant program that parallels the Great Basin program.

CHAPTER 3

A short history of reseeding Western grasslands

About 1910, soon after the US Forest Service was established, a fellow by the name of A. W. Sampson was commissioned by the Bureau of Plant Industry in the Department of Agriculture to determine what was going on with the floods that were coming particularly off the Wasatch Plateau. Mormon settlements throughout Utah had been located pretty much in the mouths of those canyons to take advantage of the water. But beginning in 1888, these settlements were being wiped off the map with summer storms.

So Sampson came here, but he also set up studies in the Blue Mountains of Oregon. That particular year, though, there were some heavy summer storms, and the communities down by Ephraim and Manti were almost annihilated. People got up in arms, and so Sampson was called back to Utah.

Then Sampson began looking at what was going on. He fenced some areas. Set up some sediment collection sites. And he quickly found that if you reduced livestock grazing, you quickly stabilized those sites.

Sampson then got involved right away in some remedial treatments which included seeding. Now this was 1912. Crested wheatgrass[5] wasn't introduced in the United States until the 1930s.

So Sampson didn't have that, but he began collecting seed of local species which included grasses and broadleaf forbs. And he set up a number of small plots where he planted these different things.

Most of the native grasses and forbs that are planted have not been bred to the extent that these introduced species have been in regard to uniformity in germination and seedling establishment. And when you think about it, it's probably not in their interest to do so. The turnover that occurs in a plant community doesn't require a lot of repopulation. So it isn't necessary that a plant produce seed with the attributes to completely repopulate a community every year. They don't have to, and so they don't.

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3. Monsen's reference to the "UP team" is to the Uncompahgre Plateau Project. See http://www.upproject.org/ (last visited 9 May 2008) for more information.

4. Greater sage-grouse (*Centrocercus urophasianus*). Large chicken-like bird; grayish in color; belly black; long tail, with spiky tail feathers. See http://www.birds.cornell.edu/AllAboutBirds/BirdGuide/Greater_Sage-Grouse.html (last visited 9 May 2008) for more information.

5. Crested wheatgrass (*Agropyron* spp.). Perennial grass native to Russia and Siberia; brought to the US in 1898, but not used for large-scale reseeding of Western rangelands until the mid-1930s. See http://www.livingwithfire.info/pdf/WEB-CRESTED_WHEATGRASS_HERO_OR_VILLIAN.pdf (last visited 9 May 2008) and http://plants.usda.gov/factsheet/pdf/fs_agcr.pdf (last visited 9 May 2008) for more information.

But when we seed an area we want uniform stand establishment. We want to insure that when we plant, we get enough ground cover to stabilize the soil. So Sampson, as well as other scientists, began looking at introductions from Europe. They found that these species were not only ecologically adapted to the sites that they were working on, but that ones like smooth brome[6] and intermediate wheatgrass[7] had very vigorous seedlings—seedlings that could establish amid the very unstable conditions that occur on the surface. They actually found with smooth brome, for instance, that if they seeded it in the fall, that by the following summer it would tie down the soils and stop erosion in its tracks.

Well, with that and those other experiences in mind, it was understandable that they began to shift attention to these introduced species.

And they found that those introduced species, like orchard grass and timothy and tall oat grass and intermediate wheatgrass and smooth brome, were all excellent forage plants. That's what they had been developed for in Europe and other areas. They had excellent seed germination characteristics. They could be planted with conventional equipment. And they were cheap.

They did try the natives—they discussed this thoroughly in their notes. They weren't stupid. They knew that these plant communities have evolved and that these different combinations of plants were probably the most adapted to these sites.

Anyway, that started this whole effort of reseeding that began by the 1920s. As they got up through the 1930s, the Dust Bowl issues put a lot of attention on introduced species.

Crested wheatgrass then came into its own as did other plants. And the Dust Bowl effort had a lot of influence in the Great Basin. The response they got with seeding exotics in these areas told them that they could use them. And they did. It was kind of a universal acceptance.

Up 'till the time of the Second World War, the agencies were really trying to get a handle on grazing and other issues. And they were making really good progress. But Perry Plummer and other scientists who lived through that period told me that as the Second World War came on, there was a real effort to increase red meat production on federal lands. And the scientists who weren't drafted into the armed services were instructed to look at developing plants and grazing practices that could sustain this increase in red meat production. And they did.

At that time, annual rye[8] came into the United States and was looked upon as a potential plant for this purpose because it seeded well and it offered excellent forage. It goes from nothing to waist high. It seeds itself back, so they didn't have the expense of replanting. And they could plant it in the toughest areas and still get a wonderful pasture.

Well, within in a year or two they realized they had a weed on their hands. Again they weren't necessarily stupid or unobservant, but you have to appreciate what was driving the whole system.

Then after the Second World War, livestock grazing became the principle land use here in the West. Dollars for administrating grazing were the principle dollars the agencies were getting.

6. Smooth brome (*Bromus inermis* Leyss.). Perennial grasss native to Europe; used in range seedings in many areas of the US. See http://extension.usu.edu/range/Grasses/smoothbrome.htm (last visited 9 May 2008) for more information.

7. Intermediate wheatgrass (*Agropyron intermedium*). A sod-forming, cool-season, perennial grass native to central Europe, the Balkans, and Asia Minor; introduced to the US in 1932. See http://www.animalrangeextension.montana.edu/articles/forage/Species/Grasses/Intermediate-wheatgrass.htm (last visited 9 May 2008) for more information.

8. Annual rye (*Lolium multiflorum* Lam.). First introduced from Europe; also known as Italian ryegrass.

And the policy was to enhance these lands for stabilization of livestock grazing.

Many of the scientists realized that we shouldn't be increasing livestock grazing beyond what we had. They recognized that they needed to stabilize a lot of sites. I talked to many scientists early on who said, "Look, we know we seeded crested wheat and intermediate and smooth brome in areas. And we knew that that probably wasn't the best thing to do, but it did alleviate the pressure on adjacent areas. And it made a big, big difference." And I see that. I know that is the case.

Now, I am of the opinion that many of those seedings have saved us in a sense. I'm confident that they drew livestock off from areas that would be in a heck of a lot worse condition today than if they didn't have them.

In addition, many of the areas that were treated have been able to set the stage for natural recovery. Even though certain species were seeded into them that weren't native, they haven't necessarily dominated over time. And we are seeing rather encouraging shifts toward a very native vegetation.

You have to keep in mind too, that we're talking about plant changes and ecology that evolve over many, many years. We too often try to draw conclusions and equate what's good and what's bad based on the first ten years or even the first fifty years after a planting.

I can tell you we've got a lot of study sites here that Sampson put in at the beginning of the twentieth century that have made surprising changes in the last ten years.

So on one hand we've worked aggressively to get away from seeding exotics. On the other hand, I think if somebody asked me today what we should do in these really low elevation sites where cheatgrass and other weeds are coming, my idea would be to seed them in crested wheatgrass and stabilize them and not let them get any worse.

We've got a lot better chance to remove crested wheatgrass and move the natives back there, than we have of trying to get rid of the weeds that are coming onto the sites. So although I'm not an advocate of changing to exotic communities, I'm realistic enough to know that we're in a transition period, and we're probably gonna be using some exotics still in the future. But we can be selective and careful in how we do that.

CHAPTER 4

Background of the Great Basin Initiative

In the late 1960s, the Bureau of Land Management received some money to look at improving wildlife habitat areas through what they call a Sikes site.[9] Monies had to be spent through a cooperative effort with a local game department or with some local cooperation with a state agency. The Bureau of Land Management had opened up some areas for farming in southern Idaho near Bliss and Jerome. They had allowed individuals to come in on some rangeland sites, and they actually developed both a massive water system and extensive farming areas along the Snake River.

There were several areas within those farming districts that did not go into private ownership. The BLM and the game department decided that those areas could be useful as hab-

9. The Sikes Act (16 USC 670a-670o, 74 Stat. 1052), as amended, Public Law 86-797, approved 15 September 1960, provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, development and maintenance of fish and wildlife resources on military reservations throughout the United States.

itat, primarily for game birds. And so instead of transferring those lands to private ownership, they began managing them. These were basically Wyoming sagebrush sites, many of which were heavily infested with cheatgrass. So the cheatgrass issue became very apparent throughout southern Idaho as fires were increasing in size and as cheatgrass continued to spread throughout that part of the state.

And it wasn't uncommon in the late 1960s and '70s that instead of having two- or three-hundred-acre fires, they were burning thousands of acres. Some of those fires increased into hundreds of thousands of acres. And they were reburns.

So cheatgrass was on us well before the 1950s, but we hadn't fully recognized it.

I had been assisting BLM in some of their fire restoration efforts. At that time, we just simply didn't have the native plant materials that we wanted. And we were trying to balance that with exotics and trying to get shrubs back into these communities. It was a transition period of trying to stabilize those fires, controlling cheatgrass, and yet getting those native communities back in place.

With the Sikes site that we got, though, in the 1970s, we had the opportunity to fund some research for about a five-year period. And we got a lot more aggressive then in trying to bring native plants into play.

I continued then with that work. In the late 1970s—probably 1978 or '79, we wrote a proposal to BLM to get some funding on a continuing basis to implement a program to develop the native plant materials to put back in these areas, as well as to develop techniques for eradicating cheatgrass. We got some money over a year or two period of time. It was always kind of on a year-by-year basis.

Then, I believe, in 1983 we had some very heavy snowfall. And deer that normally wintered in the foothill areas coming out of the Sun Valley area moved down into lowland sites because of snow depth. But many of those areas had been burned, and there were no shrubs left on them. And the animals were faced with trying to survive on cheatgrass or crested wheatgrass that had been seeded in many of those burned areas. And they simply couldn't do it.

There were deer on the Interstate struggling to survive. And people running into them at night.

And a large herd of antelope[10] were lying on the railroad tracks and were wiped out by a train one evening.

So the Idaho director of BLM, Delmar Vail, then recognized that they needed to restore these sagebrush communities. And that was a big turnaround because it had not been popular to seed sagebrush up until that time. It just wasn't accepted by the management agencies.

So with Delmar's blessing they organized a committee, which I happened to be on, to look at restoring sagebrush communities in southern Idaho. We became much more aggressive then in doing that. And funding then became more assured.

In 1985, I was instrumental in getting BLM to hire an individual to work with us in a collaborative role. And they were successful in hiring Mike Pellant.

Mike really blossomed in that job. And he and I worked hand in hand together for a number of years. We were able to get money through a program we called Greenstripping, which was

10. Pronghorn antelope (*Antilocapra americana*). See http://animals.nationalgeographic.com/animals/mammals/antelope.html (last visited 9 May 2008) for more information.

probably not a very good terminology. We envisioned that we would have to break up some of these areas with vegetation or something to keep fires from spreading. We simply didn't have the money to restore the enormity of areas that were being burned each year. And the idea was to contain fires in segments or units by planting more fire resilient species around the perimeter to reduce the costs of repeated fires.

That attitude caught on and became known as the Greenstrip Program. But our primary emphasis was to stabilize those fires and give us time to obtain plant materials to truly restore these sites and in doing so reduce this cheatgrass fire cycle.

We were able to get, through congressional action, about $350,000 allocated to Idaho on a continuous basis. Half of that was earmarked for this research and half was to go for on-the-ground treatment projects.

We continued with that effort from sometime in the mid-1980s up through 1999 or thereabouts. The recognition of the problem in Idaho and throughout the West just became greater and greater. It was through that effort that BLM tried to get Congress and others to provide them with more stable funding for the entire Great Basin. But the Idaho project was the focal point that got the message home. And the funding then came in.

Mike and I, primarily, sat down with BLM and drafted a more comprehensive program for the Great Basin. And we were successful then in getting two or three million dollars over about a five-year period to expand that effort and to study the species we'd like to use. We don't really know their geographical range or areas of adaptation, nor how far can we can move plant material.

Some of the differences in traits of individual species are significant. They each have evolved to fit germination conditions that are unique to a site. And if you move them from one location to another, the probability of them surviving is quite a bit less. But they still may have the genetic attributes and features to adapt to these other sites. The germplasm may still be the same. It's just that the plants in a particular area are expressing response to climatic conditions or something very unique to that site.

So we had to spend quite a bit of time identifying what we call ecotypic populations, and then defining their range of adaptation. You just can't do it by a laboratory test. Often that requires collecting material and planting it in what we call "replicated gardens" or "planting sites" and observing the survival and growth of the plants over time. So that slows one's progress.

In addition, many of the species we have never grown. We can't harvest enough seed from wildland collections to provide the volume we need for large-scale plantings. Consequently, those plants have to be brought into some degree of cultivation. And again, they're quite unique. When you move them from a wildland setting to a cultivated field, you may not have the insects necessary for pollination. Or disease problems might be much more acute when you begin to irrigate them.

And harvesting techniques are not known. Harvesting the seed without damage is a challenge. And another is trying to create a seedbed that's conducive for establishment when planting these large areas. Many of them still contain a large amount of weeds. You have to bring weeds under control. You can't plant into a heavy amount of competition.

We started out trying to understand the biology of these plants and then we tried to figure out how we could re-establish them back onto the sites. And we did that pretty much on a species-by-species basis.

We tended to select the plants that were most prevalent in an area. And we concentrated on the most obvious and abundant species.

We have found that wildlife and other animals rely on a complex of species. You can re-establish sagebrush and understory grass back into some of these disturbances, but that's not the same as restoring the community complex. And you certainly haven't restored the habitat necessary for sage-grouse. They need forbs and a variety of species that can sustain them year round. And big game are the same way. As are small mammals.

So it became apparent to me early on that we needed to look at restoring communities in their entirety. And that's a lot different approach and effort than trying to restore one or two plants at a time.

CHAPTER 5

Long-term livestock grazing promotes the spread of pinyon and juniper

Pinyon-juniper[11] occurs in a zone that was abusively used by livestock from the time of early settlement right through to today—foothill areas that we refer to as spring-fall ranges.

The livestock industry used these sites in the early spring as they came off of winter grazing areas, primarily in these West desert conditions. Animals just concentrated on those areas. And this included every form of grazing animal, not just livestock. But it was particularly conducive to abuse by livestock because ranchers would come back to these areas year after year.

And they had a tendency—. Not just a tendency, but an urgency to move onto those sites the minute any kind of green appeared. And then they never allowed an opportunity truly to get any amount of growth or size or vigor in the vegetation.

Then, in addition, these areas were heavily used in the fall by livestock as they were brought back from high-elevation rangelands, back toward ranching holdings and back toward the private land that was owned by ranchers. Many of these ranches had pinyon-juniper and related shrublands as part of their private holdings.

Then, if that wasn't enough, these sites were the ones that really supported big game animals through the winter time. There were many shrubs and a number of what we call half shrubs[12] that would grow up and produce quite a volume of material. They would grow on south and exposed slopes. And during periods of deep snow they furnished excellent forage that could sustain big game animals through the critical two-to-four week period in the winter.

In addition, the loss of the understory reduced the incidence of fires because the grasses and the forbs that naturally grew in those areas provided a fuel base for fires to ignite. In addition, any fire that did occur, we were pretty aggressive in putting out.

At least in the areas where I worked in the Great Basin, the pinyon-juniper communities have been devastated by grazing. And as that happened, we've had a shift in composition of plants.

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11. Pinyon-Juniper woodlands (PJ) are a significant vegetation type in the Southwestern United States, covering approximately 30 million hectares. See http://www.santafe.edu/~pth/pj.html (last visited 9 May 2008) for more information.

12. Half shrub: a perennial plant of which only the bottom portion produces permanent woody tissue. May also be called a woody perennial or dieback shrub. One example native to the Western US is winterfat (*Ceratoides lanata*).

Studies have clearly shown that pinyon-juniper has increased dramatically in the last hundred to hundred-and-fifty years.

There's a direct relationship that's been well established that as trees increase in biomass, the understory slowly diminishes. That includes the shrubs as well as the forbs, as well as the grass complex. And as trees ultimately gain dominance, we lose the understory, with or without grazing. The sad thing is that once you cross an early threshold there is no way to reverse that unless you go in and intervene—physically intervene.

And so, the changes that are so critical are sometimes not apparent because it occurs when the first trees start to invade. Once that happens then the die is cast and, it's just a matter of time.

And what we're now seeing, and what we're realizing, is that as these trees increase in density, and they get to the point that we call closed stands (where the trees are touching one another), then the incidence of fires goes up dramatically. In addition, those are pretty devastating fires, and they're sometimes not easy to contain and control. So we then move into a fire pattern that is really quite out of bounds.

The other thing that has happened is that cheatgrass and other weeds are well suited to the pinyon-juniper sites. And cheatgrass, particularly, does invade these pinyon-juniper stands and can exist with the trees in a scattered and very patchy pattern. You'll find cheatgrass occurring around the halo of the trees or in little interspaces.

And the distribution pattern is significant as well as the abundance of cheatgrass because once the trees are removed or killed by fire there's sufficient cheatgrass for the site to immediately be transferred to cheatgrass.

And there are some good ecologists, particularly Robin Tausch in Nevada, who suggest that we may not have pinyon-juniper in another hundred years or so—that we're converting these sites to annual grasslands and that's going to continue unless we intercede.

There are two or three things that are critical and different with pinyon-juniper from other community types. We can have a transition that occurs in a sagebrush community where grazing or some other use has reduced the understory. And we can have cheatgrass invade those sites. Sagebrush or rabbitbrush[13] or some other species may increase, but they're not a significant problem in trying to manipulate. Few, if any, of the species that occur in those areas produce seed that remains in the seedbed for more than a year or two.

So if you want to control competition in those sites, you need to reduce the capabilities of the existing plants to set seed one year and then control the seed that's in the seed bank for about another year. If you do that you have a site that's relatively free of competition, and you can then successfully plant. It's not quite that simple, but that's a pretty good comparison.

On the other hand, pinyon-juniper sites may take from fifty to a hundred-and-fifty years for them to be converted from a grassland or a shrubland to a tree-dominated area. In that time period you exhaust the seed bank of all the understory plants. So if you remove the trees you don't get a very favorable recovery of the understory unless you do that early when there's still a well-distributed number of plants. If you wait until you get these closed stands then you've had many, many years where the trees have produced seed and you have a tremendous buildup of

13. Rabbitbrush: common name for plants of genera *Chrysothamnus* and *Ericameria*. See http://en.wikipedia.org/wiki/Rabbitbrush (last visited 11 May 2008) for more information.

tree seed in the soil.

So even if you treat those areas successfully, the probability of the trees recovering and coming back over time is quite high. You're really looking at repeat treatments. You might not like it, but that is the case.

And we have a lot of people who look at treated areas and they see trees recovering and they say, "Huh, it didn't work. You weren't successful."

But we were successful in getting the understory back in on site.

So restoring the pinyon-juniper sites requires reinterjection of seed. You can't rely, to a great extent, on recovery of on-site seed.

Many of these sites are woodlands, or they're a very complex assortment of communities. And it's critical that we re-establish this diversity. You just can't go out there and seed three or four species or even a dozen species across a ten-thousand-acre site and restore the communities. They're too diverse.

The scariest issue for me is that we now have weeds that are displacing cheatgrass—that are much more serious than cheatgrass. And it's to be expected. Most of us have been taught, and you probably see it in your garden, that the first weed that's there is not the last one on the scene. If you leave an area alone, you know you're going to have weeds invading weeds. And many of those situations will become progressively worse. That is occurring in the Great Basin and throughout the West at an alarming rate. We have yellow star thistle.[14] We have a number of knapweeds.[15] We have skeletonweed[16] in Idaho that I saw when it occupied an area of probably fifty by fifty feet. And now it's across thousands and hundreds of thousands of acres.

We have here in Utah a very troublesome weed called squarrose knapweed[17] that has been in this area, and on into Tintic, Utah, since the 1940s. It never had done anything. And then beginning in the 1980s, it's really taken off. It's displacing cheatgrass and is much, much more troublesome and difficult to deal with than cheatgrass ever will be. It burns as well as cheatgrass. The seeds do not require much of a disturbance for occupation. They germinate right on the soil surface.

Here we now have a weed that produces underground rhizomes. If you plow it, you spread it. It has an exterior surface that is resistant to herbicide absorption. Unless you use a really aggressive herbicide it's hard to kill.

We're going to see our national parks like Zion and Bryce that are occupied by pinyon-juniper, and that to some extent are out of whack, transferred to perennial weeds. That's a scary

14. Yellow star thistle (*Centaurea solstitialis* L.): native to Eurasia; introduced to US after 1849 as seed contaminant in Chilean-grown alfalfa seed. See http://www.invasivespeciesinfo.gov/plants/yellowstar.shtml for more information (last visited 9 June 2008).

15. Knapweed species (e.g., spotted knapweed, diffuse knapweed, squarrose knapweed, meadow knapweed, black knapweed, and brown knapweed) are native to Eurasia. In the US approximately 5 million acres are currently infested with knapweeds. See http://www.invasive.org/weeds/knapweed/ (last visited 9 May 2008) for more information.

16. Rush skeletonweed (*Chondrilla juncea* L.): herbaceous perennial native to Eurasia, accidentally introduced to the US in 19th century; outcompetes native vegetation preferred by livestock. See http://www.nwcb.wa.gov/weed_info/Chondrilla_juncea.html (last visited 9 May 2008).

17. Squarrose knapweed (*Centaurea virgata*): a long-lived perennial native to the eastern Mediterranean that grows twelve to eighteen inches tall. See http://www.lpcweeds.org/squarroseknap.html (last visited 9 May 2008) for more information.

issue, because how will we deal with those in national parks? Are we willing to go in there with equipment and herbicides? What are we gonna do?

And so that's why I'm really concerned about pinyon-juniper woodlands. We need to get aggressive with it. We've got a window of twenty-five to fifty years at the most where we may have an opportunity to control this perennial weed invasion throughout much of the Great Basin. But it's fast closing in on us.

CHAPTER 6

Unproductive policies of the US Forest Service

The fires that we're seeing in lowland areas are indicative of communities being totally out of whack. And whether we like it or not, we'll need to get into those sites with equipment to control weeds. I hate to see us put herbicides and things like that down, but I think resisting doing that is just cutting our nose off to spite our face.

This is where agencies and people on the ground have not done a very good job in alerting the public about the seriousness of the issue. We don't have an I and E staff.[18] Yet I don't think that there has been a degrading change in community types that has occurred in North America that is as severe as the cheatgrass and related perennial weed problem. It's felt, in a sense, but it's not widely known.

It's not a political issue. It's not an issue that's discussed by the general citizenry. It isn't an issue that's really driving our management decisions to any great extent. We're more concerned about allocating dollars for fire suppression and control than we are in addressing the real problem.

BLM and Forest Service have had some really idiotic policies about seeding and planting. And the Forest Service, right now, is even moving back to some of those stupid issues where they only allow you to seed one species. Or you can only plant in a certain season. You have to be on a site within ninety days after a fire. Some of these things are just nuts. They just are not ecologically sound.

A complaint I have with the agencies is that after a fire goes through an area, they bring together a staff of people they call a bear team. And they're brought together to help the local agency develop plans for remedial treatment and things of that nature. Most of the people that are assigned to these teams are on a district or an area that often is short of money at that time. So they transfer over a wildlife biologist or some other expert.

The agencies do not have specialists that deal with restoration. They don't have people that know, seriously, what in the hell they're doing. They have some people that do, but they're not in a position to deal with these large-scale remedial treatments. There's plenty of information out there to direct them, but they're not using it. And it's a hit or miss situation.

They should have reclamation specialists in every state. And those individuals should be aggressive in buying seed, preparing for fires ahead of time and writing prescriptions that are

18. I and E staff: Information and Education. Many federal agencies have a group or unit that deals with collecting and providing information to the public.

realistic—ones that are ecologically sound. And not doing it with a bunch of novices.

Agencies fail to monitor conditions of public lands

One thing the agencies don't do very well, if they do at all, is monitor. They just don't put money into long-term monitoring. And they claim they don't have the time or the money.

I just think that's an abuse. Monitoring is where they should be putting their dollars. They need to hire on-the-ground, well-trained plant ecologists and people that can gather the data they need.

It's sad because in this region they've got some older taxonomists, botanists, and ecologists that are just wonderful people. Very, very knowledgeable. People who really provide them with an example of the kind of employees they ought to have. But the government is not trying to promote them, and hire and train people with those skills.

So to a great extent we don't know what some of these plant communities are doing. And we should.

CHAPTER 7

A vision for the management of Western public lands

The George W. Bush administration[19] is perceived as being not very ecologically sensitive. On the other hand, I think the Clinton administration[20] was perceived as being concerned with only setting areas aside—being preservationists, in other words. And within the agencies both extremes have created problems because we need really aggressive management. If we're gonna deal effectively with the problems, we need to get out on the ground and reduce competition. And we've got to get in there and effectively plant. That means being very, very proactive. We should have money to deal with weed issues on a year-to-year basis. And we don't.

Think of it as being in a business that relies on these lands to sustain it. What you do is ask where your revenue is coming from. What's preventing you from not necessarily maximizing revenue, but stabilizing it? Are you depleting your resources as you're using them? What must you do to insure that the resources are self-sustaining? And if you find that they're not, then you should divert a lot of income to stabilizing those resources. And you're gonna put your money where you can get the most bang for your buck. Or in this case, I think we need to look where we must invest funds to insure that we're preventing things from getting worse.

I don't hear that kind of discussion about land management. I never have in my entire career.

Our Utah governor, along with others, is really pushing the Great Basin Initiative. He sees that these lands are in bad shape and he doesn't want to see these fires. But I still think that they're pretty short sighted in the way they're going about it.

I wish that we had someone from the West that had an ecological background that truly understood what the issues are out here. I don't know anyone on the current scene that has that.

And I haven't seen in my entire career that the secretary of Agriculture or Department of Interior personnel even talk about that. They talk about defining objectives, and they'll talk

19. George W. Bush, president of the United States (2001–2009).

20. William J. Clinton, president of the United States (1993–2001).

about weed issues or sage-grouse issues or riparian issues. Or things like that. And they will tend to fund those activities, but I still think they lack in trying to identify what the problems are.

We get too hung up in talking about grazing or logging or other impacts. What we need to talk about, first of all, are those sites capable of sustaining that kind of use? And if they are, then how do we best do it?

You'd think with this increased fire problem we've had that people would sit down and ask, "What the heck's going on out there that's causing this increased fire? Is this natural or not? And if it isn't, what can we expect? And what should we be doing to take care of the problem?" But I don't see that happening.