

Well, I think we'll move on then and begin to actually look at the reference sheet development for this sandy ecological site and I'd like to ask you now to take your technical references, the interpreting indicators of rangeland health and to actually turn to page 72 and we're going to refer back to this as we go through the process. This will be the reference sheet that you would actually have to fill out as you're going through the reference sheet development and now, let's also pull up the PowerPoint slide that we have that shows the two particular grassland communities that we can actually have in this sandy ecological site and you can see these two communities that occur here. One is the black Grama grassland on the left-hand side of the screen and the other one is a bunchgrass community, considerably different in terms of how they look and the makeup associated to those particular site. I'm going to continue to reprove back to these different types of communities as we go through this discussion for developing the reference sheet for this ecological site, but, right now, I think I'd like to have Jeff taking these two communities that we see these photographs of and lead us through a discussion in a little more detail than we've done before and how do these photographs, where do they fit in to that state and transition model and what other components might we see from the photographs that would reveal some information associated with the state and transition models now. So, if we could go to the overhead associated with that.

Thanks Dave. Yes, if you take a look at this overhead, again, we've seen this before a little earlier before the break and the reference state again is this one up

here in the upper left corner and it does include the black Grama grassland which was the photo on the left and it includes a dropseed black Grama grassland and a snakeweed black Grama grassland and actually, the community that we see in that second photo is probably somewhere between these two, the dropseed black Grama and the snakeweed black Grama and those are just two of the communities that can occur in the reference state. The point I want to make here though is we have to be very careful that when we identify these communities and potential reference areas that they really are reference areas because you can have again some of these species present, but, these communities can be out or near a threshold. So, in other words, just because it's in that community doesn't mean it's a good reference and I'm going to, if we could switch back to the PowerPoint for just a second, that PowerPoint slide with the photos, what I'd like to do is just point out here, this area out here out front is actually pretty marginal even for that bunchgrass, snakeweed black Grama community, we're starting to get some fairly large interspaces, we're starting to get a fair bit of soil movement, in one of those bunchgrass black Grama communities that's still in pretty good shape, you're not going to have that really large interspaces developing and so, this is actually not an area that I would go to and one of the clues actually which we haven't pointed out yet, but, I'm going to point it out now is that back here has got a mesquite, what does that tell me? That tells me if we return back now to the overheads again and said I've actually not, even though we've been talking about it because it was one of the best photos we could find and they're actually not in this community here, I've moved

over to this one and that may help to explain why I'm seeing some of those larger interspaces. So, again, the foreground looks quite a bit like this, but, a community has really moved over towards that boundary and now in fact, what we've got is a little bit of mesquite in there which would suggest at least that community in the background has moved in and crossed, in fact, even crossed that threshold. So, again, this is how we're going to use these state and transition models to help provide some context for what we're doing with the rangeland reference sheet.

Well, that's great Jeff, really appreciate that. I know that there are a number of you out there, who actually work in this particular ecological site, the sandy ecological site down in New Mexico and I'd like you to use your push to talk right now to tell us, we've talked about several of the plant species that occur within this community, but, fill us in with a few of the other species that we would typically find within this site that could be important when we're starting to talk about structural / functional groups. So, what species are found in the reference state at this ecological site? So, those of you, who are familiar with this site, push the button and let us know what species you would also find in this community.

Whether or not you're working there now, I know a lot of people went to Mexico State have spent some time in New Mexico, traveled through, what have you seen?

For those of you, who have worked there and do know the country, this is in the (SD-2) resource area.

Hello, this is Joseph _____ from the Rosenfield office in New Mexico.

Yes, Joseph.

and I'm curious as to why we would not go with the photo on the right with one single mesquite which might be just, you know, kind of like a loner there.

Jeff, you want to fill in on this?

Sure, yes. The research that's been done on the Jornada over the past, actually going on a hundred years now has indicated that once you've gotten mesquite on this ecological site that species will continue to expand, it is a highly invasive species. On this ecological site (NSD-2). Now, on other ecological sites, you can have a few scattered mesquite and they won't necessarily increase and take over that site, but, all the research that's been done on the Jornada and actually starting to go back to the (BLM) transect shows that at some point, once you've got that mesquite in there it will continue to expand and the other reason I wouldn't use this as a reference even if the mesquite wasn't there is because I'm starting to see some larger spaces, more soil movement, if that mesquite hadn't

been there, I probably would've put the foreground of this picture at least down in that second state down below the reference state. We want to just switch back to the overhead again and cut to that, then, I can illustrate that and we'd really be in this dropseed black Grama but down in that state because we've started to degrade some of the other processes, not just the plant community.

That's great followup on that question and I appreciate that. Those of you who are out there with this particular ecological site when we're talking about structural and functional groups, when we're in that reference state, can you give me examples of species that would fall into the warm season grass category for this particular ecological site, what species would fall into that other than the black Grama?

Pat, can you take us through a little bit of the plant table that's associated with this ecological site and talk about the plant species that are found on this particular ecological site so that we can maybe refresh the memory of some of those New Mexico botanists who were out there.

As Dave asked, we'll take a look at the plant table, the 10 ecological site descriptions for this sandy site. As I mentioned earlier, one of the sections in the new ecological site description is the plant community section and it deals with the state and transition models that Jeff has been showing and talking about and then, it also talks about other dynamics and gives a list like the old range site

description of the historic climax plant community and so we'll look at that now. We'll go to the overhead, we'll take a look at what the plant community table shows. We truncated this a little bit, so, if any of you have this site description out in the field, you'll notice there is a column with a scientific name and some other things missing, but, basically, what this table shows is black Grama at 88 to 131 pounds per acre and that variability and that production is based on low precipitation or low production years and high production years. Then, you'll notice that the dropseeds are combined together there at 66 to 88 pounds per acre. Bush muhly is another one of the plants that you would expect to see in the climax plant community, plains bristle grass, cane-blue stem and Arizona cottontop are also grouped together, tobosagrass, threeawn, and then finally, there is a group of grasses that are listed as basically other grasses, annuals, things like blue Grama, fluff grass and some of those others. In this site description, the grass and grass sites are listed first and that's common in most of the site descriptions, most of these and this one especially. The grasses in the historic climax plant community are 75% of the total plant community and makeup about 325 pounds per acre total. Grouping of the shrubs which are the next kinds of plants that are listed on the table. You'll see that the ephedra and yucca are grouped together at about 22 to 44 pounds dense sand site brush, four-wing salt bush , winter fatty and bromelida are listed together, winter fat and for value are listed together from 4 to 22 pounds , prickly pear and broom snake weed are then listed separately. On the next page is the forb list and you'll see that there are several forbs listed, most of them are pretty minor components on

this site, most of them show a pretty wide range of production for this site and that's because there's production and whether they show up even in a particular year is very much dependent on both the timing and the amount of precipitation through the fall and winter particularly, also, in the summer. If we could look at them, there is a list of some of the forbs that are listed in the site description. You'll see if you could slide that down just a little bit more that there are actually 16 groups if you will in the site description and I want to point out that these 16 groups are not grouped as functional / structural groups. They are grouped based on annual production, based on dynamics within the species and if we use the dropseed group, for instance, the amount of site and sand that makes a dropseed in any one year is pretty difficult to determine and is pretty difficult to predict, but, the amount of all three of those species together is relatively constant given constant kind of growing seasons, so, that's why those species are grouped together and not intended to be as functional and structural groups.

Just one thing to add there, keep in mind that this is the historic climax plant community that's described here. These ecological site descriptions are derived from the old range site descriptions and so, you've got one of those five plant communities described here. You need to take in account using that same transition model and the text associated with it that you've got other plant communities that we're going to have to include as well, but, this is a good reference and one thing to note is there was one shrub that was missing from

that list and that shrub was mesquite and that's not in there because if it was that would eventually take over that site.

Thank you Jeff and Pat, I appreciate that. I think we'd like to go to the audience again now. You've seen a list of the species that are associated with this site and remember now in order to do interpreting indicators from rangeland health, we'd like to now lump these into some structural and functional groups. So, what groupings would we have? Structurally, we've already lumped them into shrubs, grasses and forbs, but, then, what other subgroups would we have, both in terms of the structure of these plants in the community and then also in terms of the function that they might have. So, what functional groups would we have associated with this site as well? This is open to anybody. We've all seen this list of plants, so, what groups would we use in the structural functional group?

What was the dominant species on the site was black Grama and it's made up of 20 to 30% of the composition in and of itself and you remember Dave's presentation a little while ago, he talked about not having a single species functional group with some exception and the exception that was listed was when a particular species may be a dominant species on a site. So, if we consider that by itself black Grama makes up 20 to 30% of the composition, what kind of functional or structural group might we call that? Anybody?

This is Kevin from Challis and I would say, however, stoloniferous grass is one of them and then break out your bunchgrasses and maybe have a couple of groups of bunchgrasses with some of the more long-lived ones in one group and some of the shorter lived like threeawns and those in another group.

You must have been reading the reference sheet. That's good, that a real good answer, in fact, that's how the reference sheet that has been developed has been broken out and how we would certainly look at breaking them out.

The dominant functional structural group on site might be that warm season stoloniferous grass and then we would have warm season bunchgrasses and breaking them out by longevity is a good thing to do, short-lived versus longer lived bunchgrasses and the dropseeds particularly might go in that short lived perennial bunchgrass category. So, what else do we have?

What about your shallow rooted perennials and shallow rooted annuals?

Good, that last group down there that we talked about in the plant table, those others, annual grasses, shallow rooted perennial grasses, blue Grama, fluff grass, those kinds of things.

Good.

Do we have anymore in the grasses that we talked about or have that pretty much covered it? It really kind of looks to me like that pretty much covers the group of grasses, we have the warm season stoloniferous grass as the dominant within the grasses, we have the short-lived bunchgrasses that might be next and they would include the dropseeds and perhaps threeawns. It might also then have the long-lived bunch grasses that would include plains bristle grass, might include the bush muhly, might include the tobosa grass, certainly, the cane-blue stem Arizona cottontop, both bunchgrasses would be in that long-lived bunchgrass group.

Excuse me, Pete _____ in Stafford. Do you think tobosa ought to be split out because it's rhizomatous and acts a lot different than some of those others?

Good and that certainly is the reason to split it out into a separate functional / structural group. Warm season rhizomatous is going to function differently than a bunchgrass, so, that is a good reason to break it out, if we look at the composition of tobosa grass on this particular site and remember, we're talking about a sandy site, in this particular site, the composition is from 4 to 20 pounds per acre per year, so, it's contribution to the plant community is relatively small and you remember one of the slides today talked about lumping and splitting and when do you lump these groups together and when do you want to split them out and whether or not you would split out an additional functional / structural group called a warm season rhizomatous grass with basically less than 5% of the

composition, it's a question that you need to talk about and discuss as you put together your structural / functional groups.

Now, this is another good place to point out as well that what they've done here in most cases as these are good descriptions and a lot of them really are as they describe the range of variability of an ecological site. So, tobosa, for example, is going to show up on the finer end of this sandy ecological site, it's going to show up where you start to get some loamier soils that are still classified as sandy and that's something you'd want to note in that reference sheet when you're putting that together. You can make these notes. Right now, most of our reference sheets are pretty short.

Why don't we move back to the PowerPoints here that has the two photographs because I think we've talked quite a bit about the different dominant plant species groups that we can have on this site. I want to point out a few of these others that we've probably pinpointed a little less information about here this might be some subdominant that can occur that might be quite important on here. What're we looking at here Jeff that could be an important component of this particular site and that could be a subdominant?

Well, in particular, I think you've circled a couple of maybe the bunchgrasses and then we've also got snakeweed in there and so if you go back and remember what Pat had there, where is he is listing, some of the other groups, shrubs and

vines and so forth, we have those showing up in that list, some snakeweed showed up of an occasional species and again, that range is probably going to be actually probably wider than is shown in the site description, the site description just shows 4 to 13 pounds per acre, well, that's for that black Grama community, remember now, we've also got these other communities involved and there's going to be quite a bit more. So, if we go to the state and transition model, we can actually see that and I know we've seen this four or five times and I'm going to take you back to the overhead again and just illustrate that. This is what is described in the site description. We need to account for these other plant communities as well and what we might see there.

The interesting thing with that is that I know in a lot of places people talk about snakeweed as being a plant that often times falls into an alternative state as opposed to be the one that's actually in the reference state. Is that a common occurrence in this community?

You know, that's a really good point Dave and 20 years ago we would've put anything with snakeweed in a separate state because we viewed it as an invasive species. New Mexico State University in particular has done an awful lot of research and basically what they've found is that snakeweed is something that comes in and out and you can't say once somethings gone to snakeweed that it's going to stay there. However, you'll note to go back to the overhead again one more time and you've got a state down here that's an alternative state

that is bunchgrass and snakeweed dominated and that would be one of those with those larger interspaces and again, try to avoid just using the state and transition diagram, you want to go to the text in these ecological site descriptions because there's a lot of good information there.

Good, you've mentioned invasive species now Jeff and the state and transition model talked about mesquite as being an invasive species on this site. Are there any other invasive species that we would need to worry about?

That is the primary one on this site. There is some concern and some new research coming out that suggests that creosote and white thornocation may come in, particularly, in the case of creosote on some of the finer textured soils on that end of the spectrum, but, the primary one throughout Southern New Mexico is going to be mesquite.