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Webinar Brief for Resource Managers

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Are we getting what we expect? Short-term response by bird communities to pinyon-juniper reductions

Presented on December 14, 2011 by Steve Knick, Research Ecologist, USGS Forest and Rangeland Ecosystem Science Center

Project Summary: Steve Knick shares his research on changes within bird communities living in ecotone regions where land management treatments have been conducted to reduce woodland expansion into sagebrush habitats. He explains the inadequacies of using sage grouse as indicator species, and the difficulties of using alternative study species.

Abstract: Sagebrush communities are changing rapidly, with invasion of grasses at lower elevations and pinyon-juniper (PJ) encroachment at the higher elevations. Woodland invasion is happening through a variety of mechanisms, including expansion, encroachment, and reclamation. To manage PJ encroachment, prescribed fire and mechanical treatments are used to reduce tree numbers. The focus of the management is usually on the ecotone region between sagebrush and PJ communities. Generally, the PJ is being reduced for the benefits of sage brush obligate species, most commonly, sage grouse, a charismatic, economically valuable umbrella species. The problem with managing for sage grouse, however, is that they are not a good indicator species: they have large home ranges that treatment area will affect little of, they are long lived and will have a lag in response time, they reproduce at low rates and will not have rapid population responses to change, and they may not be present on an area where management/research needs to be done. In order to evaluate what we are expecting as a response to management, our expectations must first be set. The parameters of the responses need to be set at an appropriate temporal and spatial scale; a short lived passerine will have a more acute response to treatments and may be able to reflect changes in the area. Bearing that in mind, Steve Knick and his colleagues used a SageSTEP project to evaluate the response of passerines to thinning of PJ woodlands. Their objectives included delineating the bird communities, identifying the underlying gradients that govern community structures, and using the changes in bird communities to interpret and extrapolate the effects of treatment. They used ordination of a myriad of variables across a series of paired treatment/control sites that varied in type across the Great Basin in several states. Because of the

Management Implications

- Short term responses to management actions may simply be the result of habitat loss
- Habitat improvements for sage brush obligate species may be long term, and regional dynamics will play into a community's response

variability of the Great Basin, the study turned more into individual case studies. In general, they were able to reach several conclusions: short term responses may be a function of habitat loss, regional dynamics may play into community responses, and habitat benefits for sage brush obligates may be long term. More research with more closely paired treatment and control and longer focus needs to be done to get more generally applicable data.

Questions:

There have been extensive vegetation treatments by the Nevada BLM and Forest Service to promote livestock grazing, including seeding crested wheatgrass. How are you taking manipulation of these vegetation communities into account in understanding baseline conditions and responses to these newest treatments? How are you taking livestock grazing into account as well? Are your treated sites grazed or fenced off?

There were some initial agreements that grazing would be excluded from some of the area, but would be allowed back on to some of the sites after the research was conducted. Grazing was excluded from some of the smaller treatment areas, but not over the larger areas.

In Five Creeks, did you have grazed and ungrazed data?

Steve: The entire Five Creek site is within allotment areas that are currently grazed. It's all grazed.

Did you assess changes to the bird/vegetation community response when vertical structures were removed?

We've collected some of that information, although for these initial analyses, we just used the ground cover values, not necessarily the changes in vertical structure. There still is a lot of the dead trees standing or many of the other live junipers still remaining, so I'm not sure how to measure some of the vertical parts, but again there still isn't enough of the existing juniper veg still there that the community has not changed a lot.

Follow Up: What about cutting down the burned snags?

You mean, would I expect to see a change? We have not assessed a change specific to cutting down the snags. I'm not sure that I would expect to see much of a change. Maybe in some of those species that are using the snags for perches or for cavity nesting or something like that, but I don't know that by cutting those down you would see much of a response in the sagebrush birds as long as there was still a large number of live trees still present.

Understanding that the cost of mechanical treatments may limit their spatial application, would you expect mechanical treatments that retain the shrub cover to have a more rapid response in positively influencing sagebrush obligates?

I think it would, just because you're able more able to completely remove more of the tall vertical structures while still retaining the shrub cover within that community itself. We've got mechanical sites as well the problem, as you've mentioned, is the size of the treatment themselves is going to really preclude being able to understand maybe much more than an individual response to that treatment itself, but I would expect that it may have a very different response to the bird community because you're able to retain the sagebrush with that community. In other words, being more selective as to what you're removing as a result of the treatment.

Are there any opportunities to look at cutting trees to minimize the structure issues?

There are, but as it was pointed out previously the ability to do that over the spatial scale at which we might need to do it is really cost prohibitive.

Follow Up: Our district has completed cutting treatments on approximately half of a 30,000 acre area, mostly in Miller's Phase I and II areas that have the highest likelihood of response in the targeted species.

I know that there were some fairly large areas where cutting was done. Getting back to the study design, the way this project was set up, it wasn't just to look at bird response and the scale at which we needed for birds but rather much of the driving force behind the study design was to look at vegetation response. And so, many of the vegetation characteristics that the different people are looking at, whether it's Rick Miller or Dave Pyke in some of the sagebrush areas, they can use fairly small areas to look at the effects of vegetation response to cutting. So our design was then to focus on the burn treatment as the influence on bird communities, although it did include for those looking at

thresholds for vegetation response it did include some smaller core plots within which, the different kinds of treatments were conducted. So we really didn't have the opportunity to go into some of those larger cutting areas and look at bird response.

If you had the opportunity to repeat the study, what would you like to see done in the design, besides better matching of treatment and control?

Getting the kind of fires that we would need to change the vegetation structure. Fire is not a very controllable thing most of the time, so we initially started with a design where we could select an area to begin with, and one of those areas was going to be burned. The reality is that we ended up having to take areas that were going to be burned maybe in places that were less than ideal for what we are wanting to look at, and then trying to adapt our study design, and find a control area to a treatment that was being planned. So we were kind of ad hoc in the planning as opposed to being able to come up with two sites and then have the ability to say, "Yes, we're going to burn that site. That was probably the one thing that I would change because it led to an unevenness in terms of when we were able to conduct the treatments, as well as the kind of geographical controls over what we had on where the treatment was conducted.

What was the fire prescription? Does fire prescription limit opportunity for the desired change in community?

I'm not quite sure what is meant by fire prescription.

Follow Up: The timing and intensity of the fire.

Well certainly a fall burn, of course the timing is going to give you a different response than if you could burn earlier in the summer. We were hindered in some of that just by some people having the burns, necessarily the size where we wanted to have those burns. I'm not sure what the prescription was, if it was in terms of the percent of vegetation that was to be reduced as a result of the burn. So they may have met their objective in removing some of the juniper. From a vegetation response, the kinds of things that we're looking at on the vegetation side of things, the level of burn may have been totally adequate to, for instance, they could select sites that were completely burned, but at the area over which the birds operate, we didn't have that level of complete burn that we would have needed to see some of the responses. So they could have met their prescription in terms of both timing and the structure change, and parts of that would have been suitable for the vegetation but not for the bird communities.

Follow Up: The management objectives for the juniper reduction were met on Five Creeks. The Five Creeks fire occurred in October 2008, temperatures were between 65 and 80 degrees, winds were 10-15 mph, and RH less than 15%. It is a balance between achieving the goals and holding fire within the unit.

Would a 1,000 acre mechanical treatment be large enough to implement a similar study design as yours?

Yes, I definitely think it would, and the other thing would be whether or not we would have the opportunity to do pre-treatment as well as post-treatment. One of the challenges we had in this was having the treatments planned with insufficient time to do at least one year of pre-treatment information, so if there are large cuttings that are being planned, we would have the opportunity to go in and do some pre-treatment surveys; that would certainly be of help. I should point out that the level of this study is much deeper than just the point counts that I've talked about today, but includes territory mapping, changes in demographics, nest searches, things like that and so on. The scope of what we did on the bird project, to be able to do that on some area that was cut, would take a substantial amount of funding to be able to duplicate what we've done on this project.