From: Noreen Walsh
To: Kevin Doherty
Cc: Stephen Torbit
Subject: RE: Laymen description of the model
Date: Tuesday, August 18, 2015 5:51:00 PM

YES! Most helpful.

If it was edited to be even more concise like the below, would it still be accurate? Please tell me if this has changed the meaning at all.

Thanks Kevin,
Noreen

We developed the Occupied Breeding Habitat Distribution Model to more accurately portray the breeding areas which are important to sage-grouse. We did this because current information available to the USFWS on the occupied sage-grouse range was developed at a very broad scale and included large areas of non-habitat. The Occupied Breeding Habitat Distribution Model uses sage-grouse lek data as a proxy for landscapes important to breeding birds, because leks are central to the breeding ecology of sage-grouse. We developed a model that statistically links habitat characteristics around known lek locations to habitat features such as the amount of sagebrush or tree cover within a 4-mile radius. The output of the model is a prediction on the probability that each 120-m^2 area within a sage-grouse management zone has the right habitat characteristics to support a breeding population of sage-grouse. These spatial predictions of occupied breeding habitat are then able to be linked with spatially explicit risk models to better understand how risk to sage-grouse, such as tillage or oil and gas, overlap with breeding habitat.

We developed the Population Index Model to spatially identify areas on the landscape which contain population centers of sage-grouse. We did this because past work has shown that sage-grouse populations are highly clumped and relatively small areas can contain a disproportionate amount of birds. To create our population index model we used lek data to identify hotspots using standard statistical techniques (i.e. kernel density functions). We then linked our kernel density function with our Occupied Breeding Habitat Distribution Model to develop our final Population Index Model. The results of our models are grids that represent an index to the relative amount of breeding birds for each 120 m^2 within management zone. Similar to our Occupied Breeding Habitat Distribution Model, our Population Index Model can be linked with

other spatially explicit risk models or conservation actions to understand spatial overlap with sage-grouse populations. For example, strong documented negative effects (e.g. oil and gas, fire, cropland conversion in MZ I), do not necessarily translate to large scale population impacts across vast areas such as the entire sage-grouse range. We would expect high levels of future impacts to occur if current sage-grouse population centers overlap areas with high probabilities of loss to stressors in the future. Conversely, we would expect future impacts to be low, if current sage-grouse population centers do not overlap areas with high probabilities of future losses.

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From: Doherty, Kevin [mailto:kevin_doherty@fws.gov]
Sent: Tuesday, August 18, 2015 5:38 PM
To: Noreen Walsh
Cc: Stephen Torbit
Subject: Laymen description of the model

Hi Noreen,

Based upon our conversation I tried to explain the two models in laymen terms why we built the models and how they can be used, what goes into them and what comes out. I have also attached an abstract and several page summary if you need any more detail. If I missed the mark, please let me know I will revise.

Cheers
Kevin

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