

DRAFT AND PREDECISIONAL – DO NOT RELEASE

- State Plans
- Other Conservation Efforts
- Other factors
 - Climate Change
 - Human Population Change

a.b. For each of the major threats identified from 2010 (fire risk and invasive grass risk, conifer encroachment, energy development risk, conversion to tilled agriculture risk) and new threats identified as population level stressors we will, through the species report:

- i. Quantify threats to both relative abundance and distribution of sage-grouse by the use of Spatially Explicit Modeling (SEM).
 - A. SEM of threats will be addressed within the landscapes they are most important. For example, we would not spend time building an oil and gas model for Idaho; instead, we would make sure our fire and invasive work is solid in that state.
- ii. Use the predictions of our SEM's quantify impacts to each PAC individually. Conducting analyses in this fashion will allow us to understand the scale of the threat to the overall distribution and relative abundance of grouse as well as to each individual PAC. If the analysis is solely conducted within the PAC, we cannot scale results up.
- iii. Understand how state and federal plans, local conservation efforts, and voluntary conservation mechanisms have removed or reduced impacts from threats. Methods will vary depending on degree of clarity within the scientific peer reviewed literature, strength of models in our SEM, and certainty of impacts or not from the USFWS' judgment. Analyses could range from modeling efforts, to expert opinion and USFWS' professional judgment. Possible methods could include:
 - A. Running different scenarios through our analytical SEM framework
 - B. Use of the USGS facilitators to employ modeling techniques such as Bayesian belief networks to increase transparency and defensibility of our decisions.
 - C. Using expert elicitation with outside parties to solicit input about the degree to which the threat will be relevant and impact sage grouse into the future. Expert elicitation could also be used to inform both the SEM and Bayesian belief network models.
 - D. Using structured internal review and analysis. To present, evaluate, analysis, discuss the best available information; consider risk, exposure to threats and likelihood of persistence; apply appropriate policies

Comment [KNorman8]: It would be good to discuss this section. We want to frame the threats discussion by drivers. We will capture the 5-factors, but it may not be presented in the way it has historically been presented. We envision an integrated analysis rather than a more traditional factor-by-factor, compartmentalized approach.