

Agency Response to University of Wyoming Cooperative Fish and Wildlife Research Unit
coordinated third party review of monitoring protocol for pygmy rabbit
populations in the Pinedale Anticline Project Area (PAPA)

I. Treatment and Reference Areas

Reviewer Recommendations:

- 1.) Determine whether the area for development to which inferences are to be made is Core Area with Development Areas (CADA) or PAPA. Identify appropriate reference areas.
- 2.) We suggest reference areas to the west (as already denoted), possibly to the south, and to the east of CADA or PAPA.

Bureau of Land Management (BLM) and Wyoming Game and Fish Department (WGFD)

Biologist Response to Recommendation:

We appreciate the input provided by the reviewers. To clarify, the treatment area includes all areas within the PAPA analysis boundary. This area includes Core development areas currently being developed and areas with potential for development. Our goal is to compare pygmy rabbit populations within the entire treatment area against the reference area.

The Pinedale Anticline Project Office (PAPO) did consider a reference area to the west of the PAPA and determined from prior BLM surveys that there were not enough suitable habitats, or pygmy rabbit sign to warrant using this area as a reference. Areas to the south are being monitored by Jonah operator's contractor per the Jonah wildlife plan using the same BLM protocols. We considered expansion of the reference area as suggested by the reviewers. However, after discussion, it was decided that expanding beyond the current reference area will not improve the current sample design and reliability of analysis sufficiently to justify the added cost.

Budget: No changes

II. Sample Size

Reviewer Recommendations:

- 1.) Overlay CADA or PAPA with a grid of rectilinear sampling units. A size of 400×400 m or 500×500 m seems appropriate. Number the grid cells and then randomly select the sample that will be monitored.

BLM and WGFD Biologist Response to Recommendation: We essentially agree with this suggestion as we actually employed this method to generate random plots for mapping in 2009 - 2010. After our contractor conducts a power analysis we anticipate having a

statistically valid number of random sample plots identified with this method to be monitored to measure population trends.

Budget: No changes

III. **Stratified Sample**

Reviewer Recommendations:

- 1.) Decide whether the plots should be placed in a small number of strata (e.g. open and intermediate density sagebrush vs. dense sagebrush) that might help predict occupancy rates.
- 2.) Decide whether environmental covariates, such as temperature and Julian date, will be used to help predict detection probabilities.

BLM and WGFD Biologist Response to Recommendation: We have placed plots in open, intermediate and dense sagebrush habitats. We will include temperature and Julian date in our analysis.

The following details the methods to be used in 2010:

At each 400x400 m sample plot the contractor will establish 9 transect lines oriented north to south. Transects will be spaced 50 m apart. The Contractor will use a GPS unit to navigate transects and record data. They will map suitable habitat within a visual range of the transect line, recording all pygmy rabbit sign using protocols authorized by the BLM.

Budget: no change

IV. **Power Analysis**

Reviewer Recommendations:

- 1.) Determine the change in occupancy that is to be detected, and then use statistical power analyses to determine the appropriate number of plots to sample.

BLM and WGFD Biologist Response to Recommendation: The change in occupancy to be detected as defined in the Matrix is an average of 15% decline over 3 consecutive years. The population numbers for 3 consecutive years will be averaged to find the percent decline. We agree with this recommendation and have made sure to include a power analysis in the 2010 monitoring project.

Budget: Additional cost item.

V. **DNA Analyses**

Reviewer Recommendations:

- 1.) Because pygmy rabbits are obligate burrowers, identify burrows and fecal pellets to confirm presence. However, because fecal pellets of cottontails (*Sylvilagus* spp.) can overlap

in size with those of pygmy rabbits, use DNA analyses to confirm species identity. To detect presence via burrows, the BLM pygmy rabbit survey protocol outlined in Appendix B of the Pygmy Rabbit RFQ can be followed. It should be noted, however, that this protocol will not allow the density of burrow systems to be determined.

2.) Observers should visit the plots at least 2 times to allow estimation of probability of detection.

BLM and WGFD Biologist Response to Recommendation: We have considered the recommendations and although DNA analysis would be most definitive, the current protocol is considered adequate for determining species identity. The added cost of DNA analysis is not needed, but will be considered if actual field work determines the need. We will require contractor to use cumulative evidence to distinguish pygmy from cottontail. Contractor will only confirm pygmy rabbit presence with actual sighting or fresh pellets, fresh digging etc., following the BLM protocols provided in the Request for Proposal (RFP).

Contractor will conduct 2 surveys of each plot. On the second survey pygmy rabbit sign will be searched for as done during first mapping effort. Different observers will be used for the second survey to reduce observer bias. In order to monitor population trends the protocol will remain consistent for each year the monitoring is conducted.

Budget: No changes

VI. **Program MARK**

Reviewer Recommendations:

1.) Use Program MARK (White 2008, Andelt et al 2009) to calculate detection rates, occupancy rates, and change in occupancy among years.

BLM and WGFD Biologist Response to Recommendation: We concur with the review team and will conduct the occupancy analysis using program MARK.

Budget/Quality: No changes

VII. **Absolute Abundance**

Reviewer Recommendations:

1.) If estimates of absolute abundance for pygmy rabbits are desired, generate them via mark-resight or snow-track surveys, rather than by using burrows as a surrogate. Price (2009) evaluated an index of abundance based on active burrow systems in Idaho, but cautioned that use of such an index to estimate absolute abundance in other areas would require calibration to the new areas. Density of burrow systems can serve as a relative index of abundance within a plot over time, but will not allow estimates of absolute abundance without validation. Caution also should be used in comparing relative abundance based on

burrow density across plots because of site differences that can influence patterns of burrow use.

BLM and WGFD Biologist Response to Recommendation: We appreciate the review team's recommendation for absolute abundance estimates. However, we believe it is not necessary to estimate absolute abundance to meet the objective of the Matrix so we will not be conducting absolute abundance surveys.

Budget: No changes

VIII. **Mark-resight**

Reviewer Recommendations:

1.) For estimating absolute abundance within plots, a mark-resight protocol can be followed (see Price 2009). An alternative to mark-resight methods is to conduct surveys of previously mapped burrow systems on the day after new snowfall to determine whether the burrows are currently occupied (see Price 2009). This method requires that a census of burrow systems within the sample plot be conducted during the autumn. The surveys should be repeated to provide an estimate of variance associated with the abundance estimate.

BLM and WGFD Biologist Response to Recommendation: We appreciate the reviewers' recommendations. However, we believe that using occupancy sampling to meet the objective of estimating abundance and presence/absence using the following methods by Mackenzie et al (2006) is sufficient for monitoring pygmy rabbits for this project. Estimating absolute abundance is not required by the matrix, only changes in relative abundance. For example, the contractor will monitor populations using Occupancy Sampling (Mackenzie et al 2006). Site-occupancy is based on sightings of pygmy rabbits, active burrows, or fresh pellets. The number of sample plots in which sign is detected will provide a reliable index of current population size. Changes through time in the number or distribution of occupied sample plots will provide information relevant to population cycles or distribution. We anticipate that site occupancy and detection may be estimated simultaneously through presence/absence of pygmy rabbit, active burrows, and fresh pellets.

Budget: No changes

References

Andelt, W. F., G. C. White, P. M. Schnurr, and K. W. Navo. 2009. Occupancy of random plots by white-tailed and Gunnison's prairie dogs. *Journal of Wildlife Management* 73:35-44.

White, G. C. 2008. Closed population estimation models and their extensions in Program MARK. *Environmental and Ecological Statistics* 15:89-99.

MacKenzie, D. I., J. D. Nichols, J. A. Royle, K. H. Pollock, L. L. Bailey, and J. E. Hines. 2006. *Occupancy estimation and modeling: Inferring patterns and dynamics of species occurrence*. Academic Press, New York, New York, USA.