Occupancy of beaver (*Castor canadensis*) in Rocky Mountain National Park: the second field season

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Executive Summary

Historic data indicate that beaver were abundant in many parts of Rocky Mountain National Park (ROMO) as recently as the 1940s. We conducted surveys for beaver in the late summer and fall of 2009 and 2010. The results from the surveys from 2009 are contained in a previous report. The information provided in this executive summary describes the surveys in 2010. This project had 3 primary objectives:
- Characterize the current state of the beaver population in ROMO,
- Identify attributes of stream segments and their adjacent terrestrial environments that are correlated with current beaver occupancy, and
- Evaluate the utility of a map of suitable beaver habitat that was developed in 2009.

We used occupancy as the metric for characterizing the state of beaver in ROMO. Broadly, occupancy is the proportion of sampling units occupied by a species of interest. For example, occupancy might be the proportion of aspen patches in ROMO occupied by a particular bird species or the proportion of grid cells in Moraine Park occupied by a particular plant species. In this study, we defined occupancy as the proportion of plots currently occupied by beaver.

Plots were 200 m x 200 m areas that contained a section of stream, and we delineated a total of 6,917 plots across ROMO. We stratified plots according to the suitability of the habitat in the plots to beaver (4 strata, where plots in Stratum 1 were not suitable and plots in Stratum 4 were the highest suitability). From each of these strata, we selected a spatially-balanced sample of 20 plots. We used volunteers and park staff (hereafter, field workers) to conduct surveys at these plots. Field workers traveled to plots using maps and GPS units. Once at a plot, they searched for signs of current occupancy of the plot by beaver and took measurements of key environmental attributes.

We surveyed 73 plots from 17 August to 21 October 2010 (Stratum1 - 15 plots; Stratum 2 - 18 plots; Stratum 3 - 20 plots; Stratum 4 - 20 plots). Evidence of current beaver presence was detected in 0 plots in Strata 1 and 2. However, it was detected in 4 of the 40 plots (10%) in Strata 3 and 4. Data were too sparse to conduct a formal statistical analysis and summary statistics provided little information regarding the attributes of stream segments that were correlated with occupancy. The fact that the four plots with evidence of current beaver presence were in the higher suitability strata suggests the habitat suitability map has some predictive power. However, field data indicate that it is strongly overestimating the amount of suitable beaver habitat in ROMO.

If managers at ROMO decide to take an active role in the management of beaver populations, this study will provide baseline data with which to evaluate the effects of future management actions (e.g., whether occupancy increased, decreased or stayed the same after management could be determined). The results of this project will also facilitate the identification of areas where active management of beaver and the landscape are more likely to promote an increase in the beaver population. In this report, we also make many suggestions to improve future projects that attempt to estimate the status of beaver in ROMO using occupancy.