

## **Effects of the Conservation Reserve Enhancement Program on Abundance and Survival of Eastern Cottontails in Pennsylvania.**

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**Abstract:** The Conservation Reserve Enhancement Program (CREP) may benefit cottontail rabbits (*Sylvilagus* spp.) and other species that require early-successional habitat by replacing agricultural crops on marginal lands with a mixture of grasses and forbs. Although many studies have been conducted on how CREP and CRP (Conservation Reserve Program) affect avian populations, very few have focused on mammals. I investigated possible relationships between amount of CREP habitat on 100-ha sites and survival, habitat use, and abundance of eastern cottontails (*S. floridanus*) on 6 sites, which ranged from having 0 to 77% of area enrolled in CREP. I radiocollared 126 cottontails in 2004 and 2005 and found some evidence that survival was greater at sites where a larger portion was enrolled in CREP. My best fitting model was the constant survival model,  $S(.)$ , with an annual survival rate of 0.23 (SE = 0.04). The  $S(\text{High vs. Low CREP})$  model also was competitive ( $\Delta\text{AICc} < 2$ ). For this model, the annual survival rate for cottontails at sites with 0 - 28% CREP and at sites with 41 - 77% CREP was 0.21 (SE = 0.06) and 0.24 (SE = 0.06) respectively. Of 59 individuals observed, predation was the primary cause of mortality (95% CI = 32 - 54%), whereas hunting (1 - 10%) and vehicle accidents (0 - 6%) accounted for the least percentage of mortality. I built site-level habitat use models for each site and season. Likelihood of CREP habitat use varied by season, but woody edge habitat was an important factor throughout the study. I estimated likelihood of habitat use to be negatively related to distance from woody edge in 23 of 24 site-season models. Likelihood of use also was greater in woodlots and hedgerows than any other habitat type in 9 models. Additionally, I conducted mark-recapture of cottontails on trapping grids within each site during 4 periods: February-March 2004, July-August 2005, February-March 2005, and August-September 2005. I captured 282 individuals in 2004 and 2005. Closed Capture models in program MARK were used to estimate cottontail abundance within each grid. Site abundance was calculated by extrapolating abundance estimates on trapping grids using habitat use models. Abundance ranged from 10 to 150 cottontails per site in summers and from 10 to 260 cottontails per site during in winters. I acknowledge that summer estimates of abundance may have been biased because abundance estimates on trapping grids during this time was primarily based on juveniles due to low capture rates of adults while habitat-use models for extrapolating abundance to the site-level was based on adults only. I found no relationship between cottontail abundance and amount of CREP habitat at a site. My results suggest that the amount of CREP on a site may not be as important to cottontail populations as other factors, such as habitat structure and configuration. I recommend continued monitoring of cottontail populations in CREP habitat and that wildlife biologists work closely with landowners to produce desirable outcomes.

The complete thesis can be downloaded at the following website:  
[http://pacfwru.cas.psu.edu/scipubs/fritsky\\_thesis\\_2006.pdf](http://pacfwru.cas.psu.edu/scipubs/fritsky_thesis_2006.pdf)

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