Cerulean Warbler Forest Management Experiment – Appalachian Mountains

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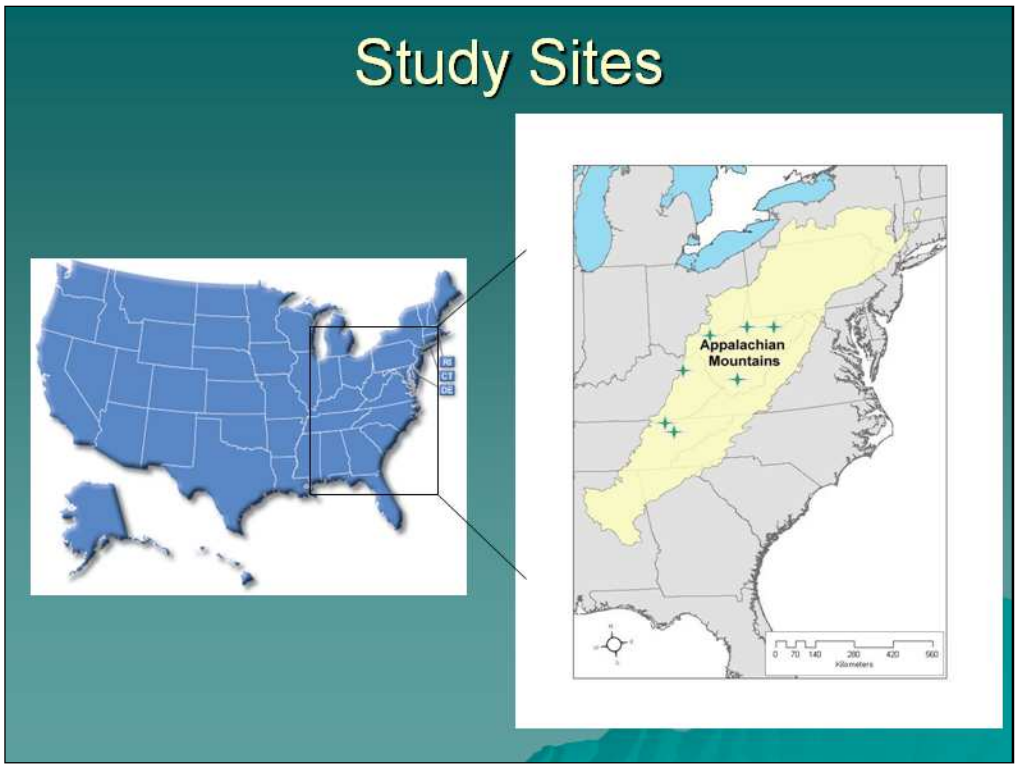
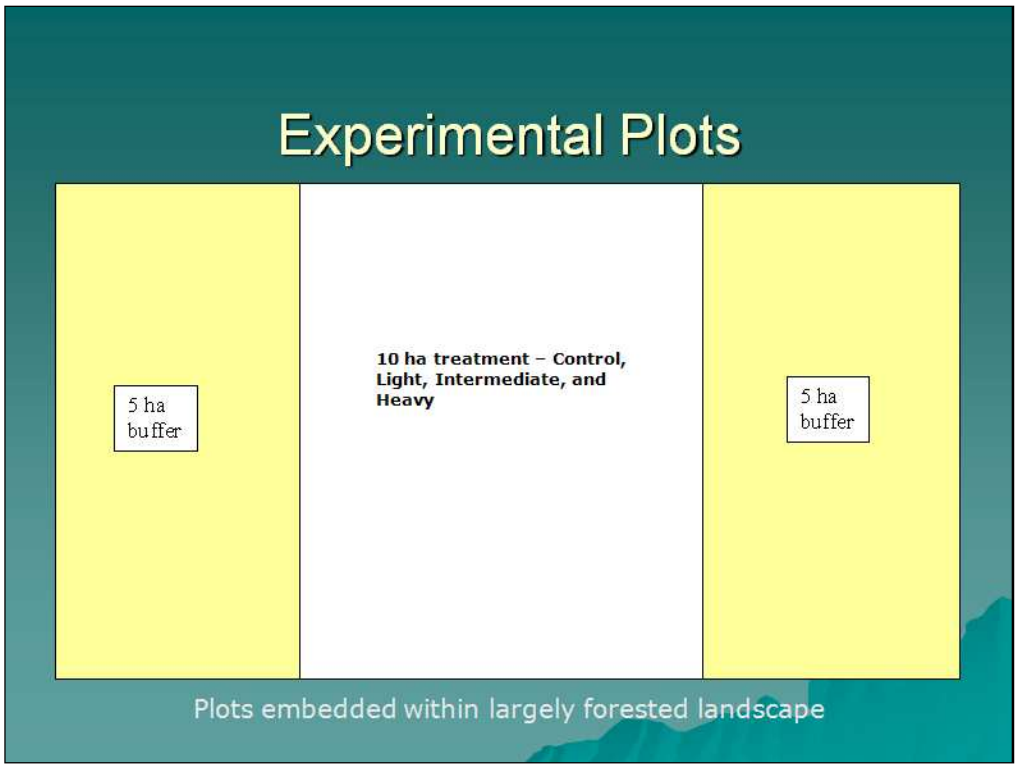
Hello, my name is Than Boves and I am from the University of Tennessee and today I will be talking about the cerulean warbler forest management experiment that is ongoing in the AMBCR. As you can see, there are a whole bunch of people that have been involved in this project and I as I am relatively new to this project I am indebted to them for a lot of the information I will be presenting today.

The main objective of this study is to…..

This experiment is important because it is a large-scale, long-term study. We have seven field sites throughout the Appalachian Mts and the project is expected to run through 2010. 2008 was the fourth year of the experiment and the 2nd after the harvests occurred. In 2005 and 2006 we collected pre-treatment data and in 2007 and 2008 we collected post



Our study sites are located in the heart of the CERW breeding range in the AMBCR. On this map, the stars designate the locations of our seven sites.



Each one of our seven sites consists of four experimental treatment plots. These treatments include a control treatment, a light harvest, an intermediate (or shelterwood) harvest, and a heavy (or modified clearcut) harvest. It is very important to note that these plots are all embedded within a largely forested landscape.

Our control plots have been left unharvested since the beginning of the study and they have an average basal area of 27 meters squared per ha. While that is the average across our sites, there is a lot of variation among the sites, as can be seen with the standard deviation of 5.1 meters squared/ha. This variability is the case for all of our treatments, which has made it somewhat more difficult to interpret some of our results.

After the harvests occurred in 2007, our light treatments averaged a basal area of 20.9 meters squared/ha with a SD of 3.2 m^2/ha.

Our intermediate, or shelterwood, treatment , pictured here, had an average BA of 15.3 meters squared/ha with a SD of 2.8.

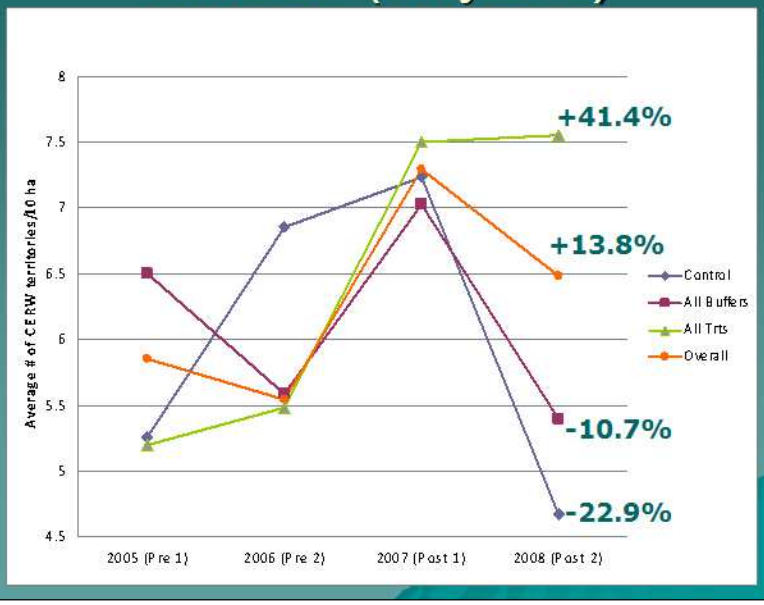
And our heavy treatments, seen here, were reduced to an average BA of 7.2 m^2/ha with a SD of 3.3.

Field Activities

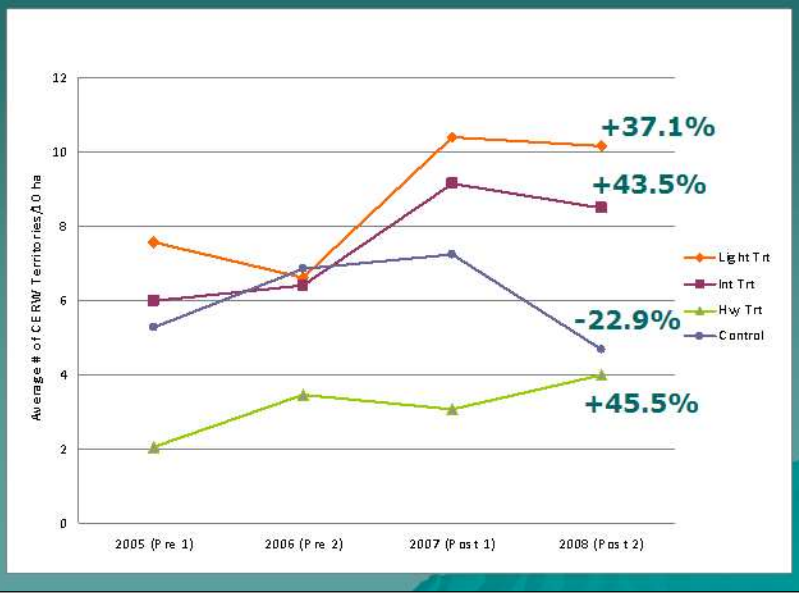
- Spot-mapping
- Nest-searching and monitoring
- Banding/Resighting
- Vegetation/Habitat Analysis

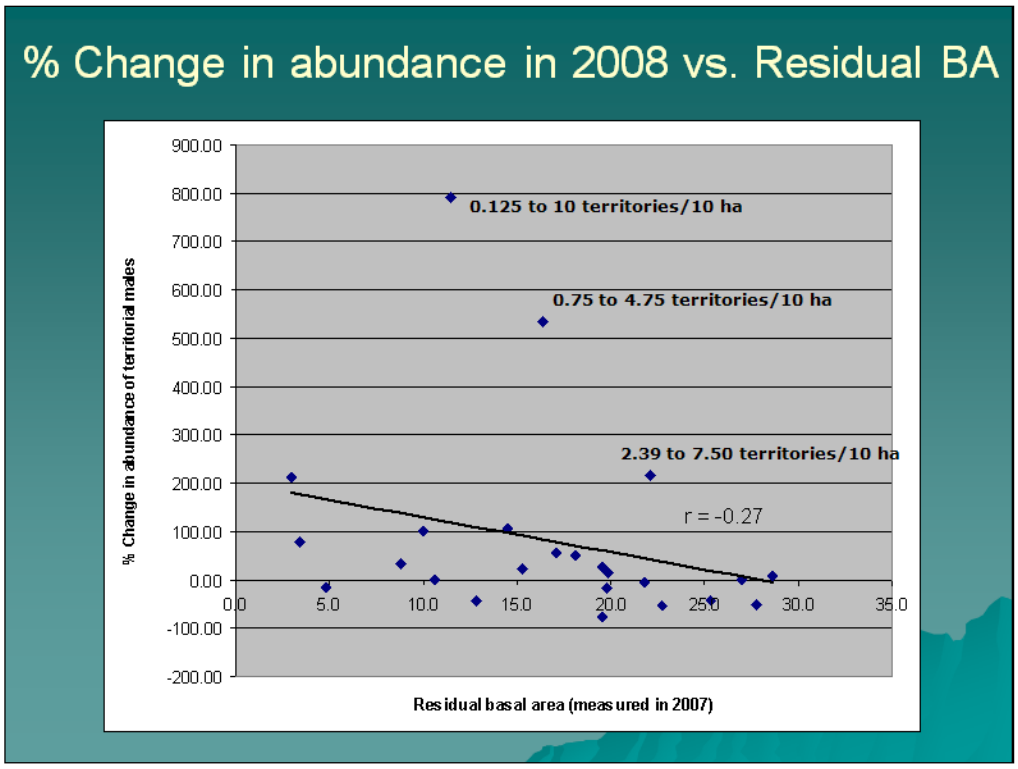
Over the life of the project, every site has performed the following field activities: intensive spot mapping for CERW, nest-searching and monitoring, banding and resighting efforts, and vegetation sampling.

CERW density trends across AMBCR (All years)

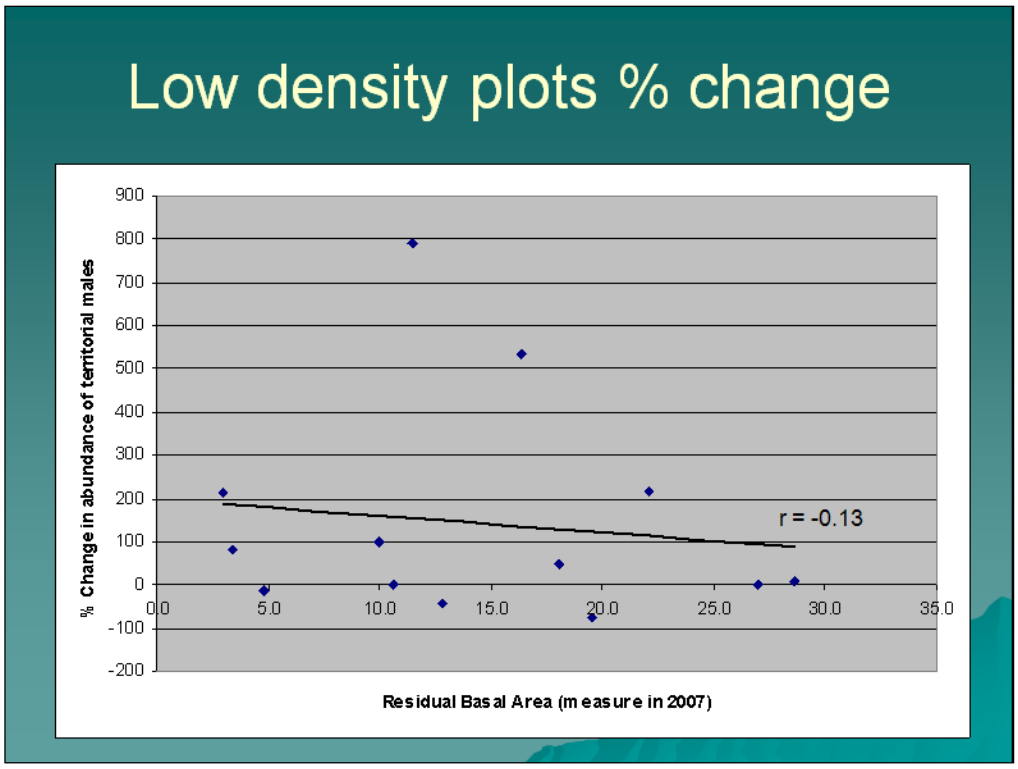


CERW density trends in treatments (All years)

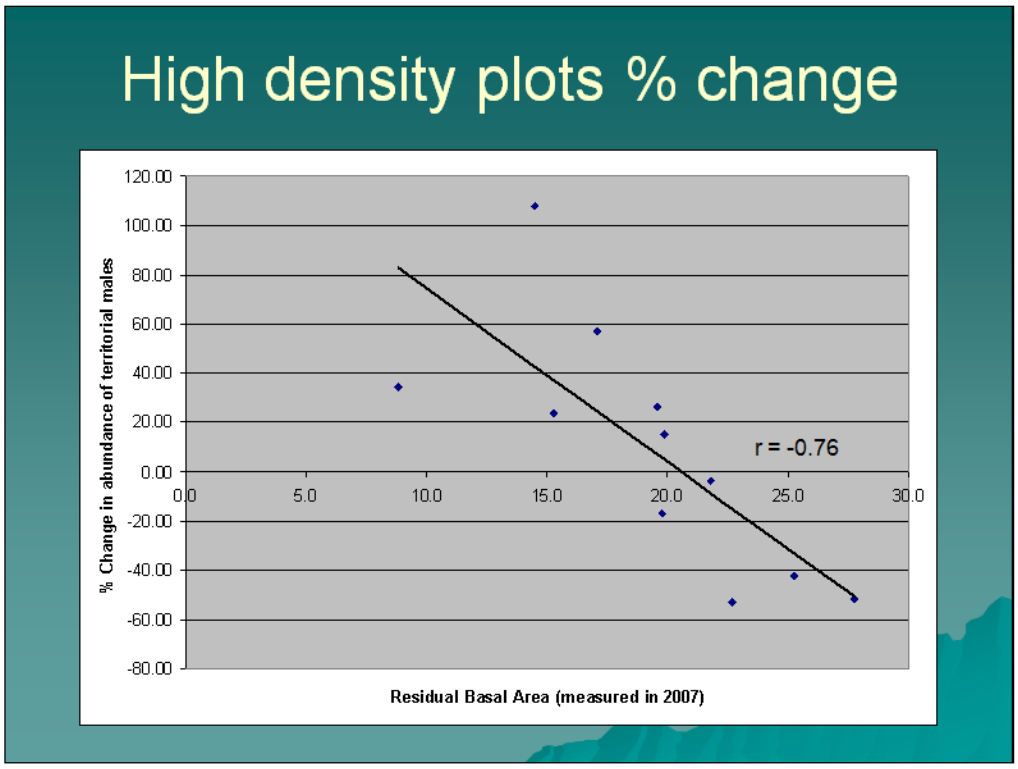




Another way to look at our data is to use residual basal area as a continuous variable, rather than in discrete treatment units (such as light, intermediate, and heavy). While we attempted to create treatments that were similar across all sites, we were unable to replicate the residual basal area as accurately as we would've liked. Therefore, this graph depicts residual basal area on the x-axis versus % change in abundance of territorial males (observed in 2008) on the y-axis. Each point on the scatterplot refers to one of the treatments at one of our sites. The pearson correlation coefficient associated with this relationship is -0.27 meaning that the % change decreases as BA increases.



Throughout our sites, the pre-harvest average # of CERW/10 ha was 4.5. This graph depicts the same relationship as previous one, but this graph only includes sites that had less than the average number of CERW territories in the pre-treatment years of 2005 and 2006. As you can see in these low density plots, the relationship between BA and change in abundance is not as high as the graph which includes all sites.

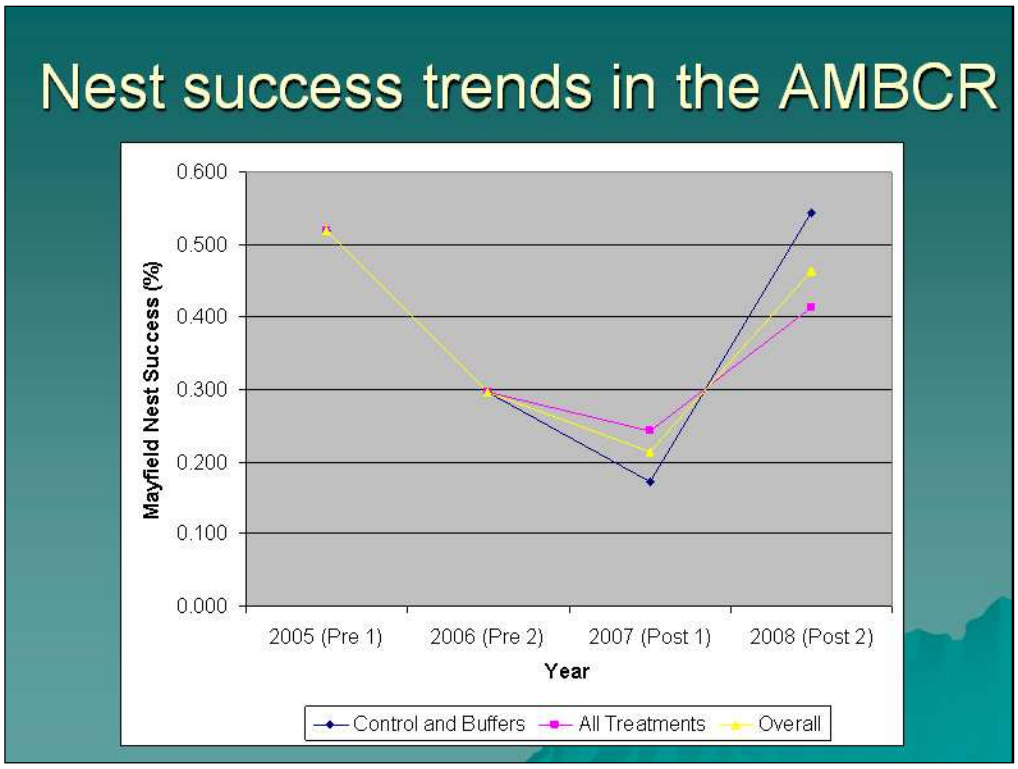


Now this graph depicts the treatment plots that were initially above the 4.5 CERW/10 ha average level. Surprisingly, these plots have a much higher correlation coefficient (-0.76) between basal area and % change of abundance.

CERW reproductive success

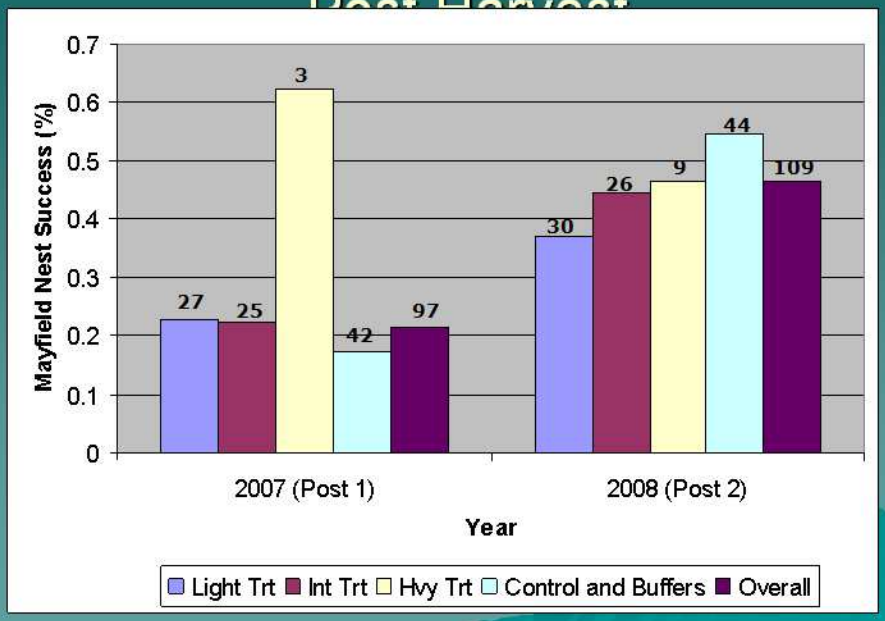
- Found 316 nests over four years
- Nest success has varied greatly among years and among sites
- Other factor more important than (and independent of) forest management?

In addition to abundance, forest management also may affect reproductive success of CERW. Therefore, we also have been searching for and monitoring nests over the past four years. So far, we have found 316 nests. We've seen that nest success has…….and it seems that there may be another factor…..

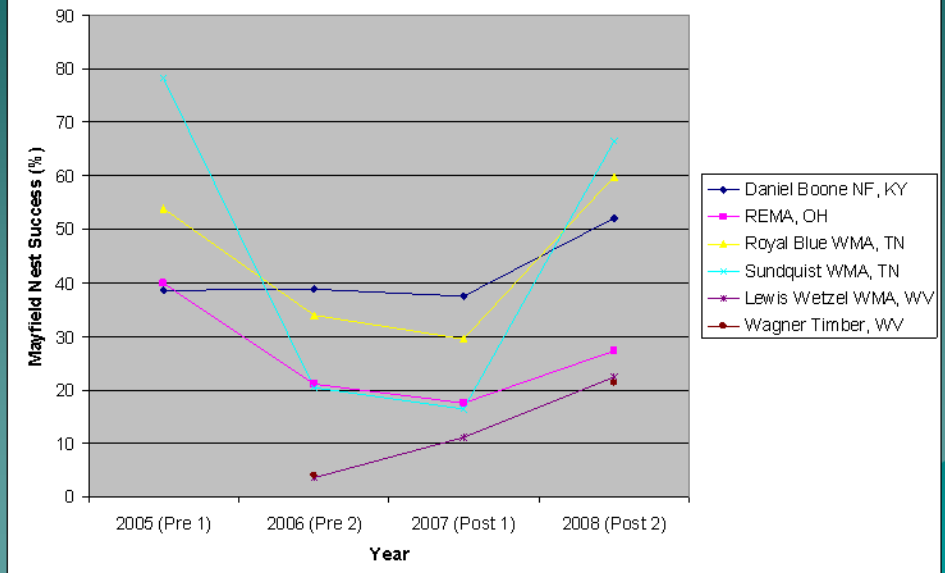


These graph depicts the nest success on the y-axis and the year on the x-axis

Nest Success vs. Treatment Type



Nest success variability among sites



Return rates in the AMBCR

Year	*Captured*	*Resighted*	*Return rate*
2005	15	NA	**NA**
2006	34	3	**0.20**
2007	108	11	**0.32**
2008	40	17	**0.16**
TOTAL	197	31	**0.20**

Summary

- CERW density increasing in all treatment types (esp. light and intermediate); decreasing in controls
- Nest success has tremendous spatial and temporal variability
- In 2008, nest success suffered in treatments (compared to control and buffers)
- Very low return rates! Where are the birds going?
- Two more years of field work!


Acknowledgements:
Tons of field technicians!
Funding sources


Questions?