

The Role of Endangered Oak (*Quercus* spp.) Savanna Characteristics in Supporting Red-Headed Woodpecker (*Melanerpes erythrocephalus* L.) Populations

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ELBERT PENCE
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UNDERGRADUATE
SUMMER
RESEARCH
EXPERIENCE

*A Funded Program in Biology,
Chemistry, Engineering, Geology,
Mathematics and Computer Science*



Red-headed woodpecker

Melanerpes erythrocephalus

- ✘ Very “charismatic” birds, as an aggressive, territorial species
- ✘ A flycatching species that also caches acorn mast
- ✘ Unfortunately, populations have declined by over 70% since 1966



Oak Savannas



- ✘ Red-heads thought to be reliant on oak savanna environments
- ✘ Less than 0.01% of Midwest oak savannas remain today

Research Question:

How do the following factors affect red-headed woodpecker abundance in summer and winter seasons?

Factor

of Dead trees

of Dead limbs

% Canopy Cover

% Large (>39cm. DBH) trees

% Oak composition

% Red oak group composition

% White oak group composition



Goodenow Grove Nature Preserve



Braidwood Dunes and Savanna Nature Preserve

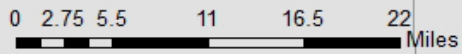
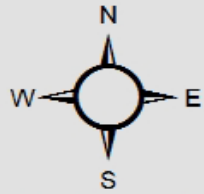


Mskoda Land & Water Reserve

Pembroke Savanna Nature Preserve



Hooper Branch Savanna Nature Preserve

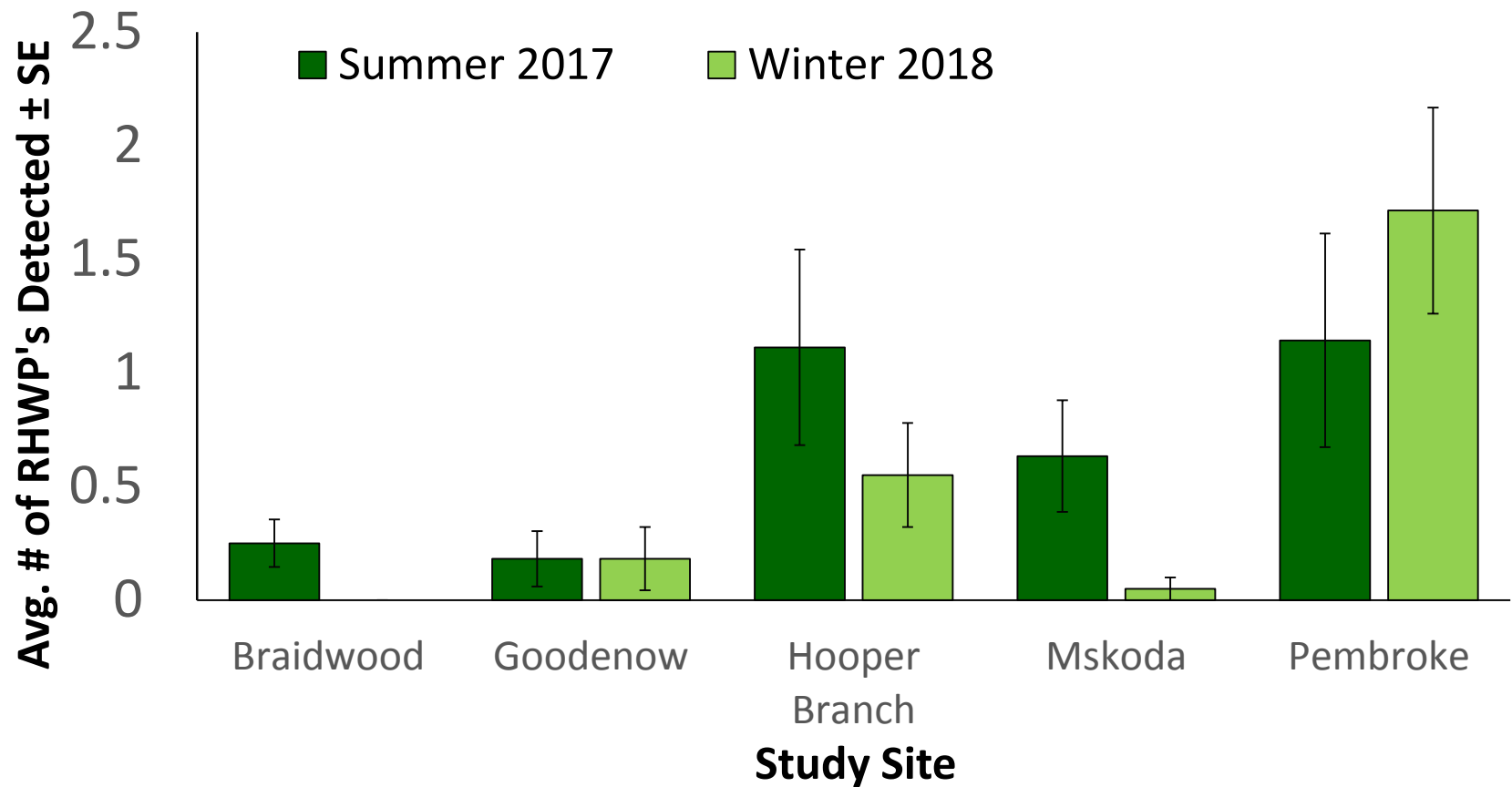




Methods

- ✘ Transects 7-11 points at each preserve
- ✘ Points separated by 200 meters
- ✘ Point count surveys utilizing call playback used to determine abundance
- ✘ Habitat analysis using a variation of the BBIRD protocol quadrat method
- ✘ Data analyzed using square root transformation of abundance and mixed effects multiple linear regression with backwards elimination with R.

Abundance differed between each site, indicating that there are some habitat characteristics that better support red-head populations than others.



The factors deemed significant in predicting red-head abundance were % canopy cover, # of dead limbs, and the % oak group trees.

Significant Factor	df	t-value	p-value
% Canopy Cover	38	-3.39	0.0016
Total Dead Limbs	38	2.50	0.0168
% Red Oak Group Trees	38	2.10	0.0422

In winter, percent large trees at a site was the only significant factor ($t = 2.11$, $P = 0.041$) predicting woodpecker abundance.

Why?



Summer Diet

- ✘ Insects gathered through flycatching behavior

Winter Diet

- ✘ Acorn mast stored in caches

Implications

- ✘ The endangered black oak savanna habitat in particular is important to the success of red-headed woodpeckers
- ✘ There are seasonal differences in preferred habitat
- ✘ There is a need to focus conservation efforts on mature oak savanna habitats



Further Study

- × Plans for replication this coming summer to better understand habitat selection
- × Particularly the relationship between abundance and the presence of red oak group trees
- × Further analysis of the collected data



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