

Introduction

- Minnesota's managed forests provide critical habitat for hundreds of resident and migrant bird species. Recent declines in upland game populations have generated a renewed interest in using forest management to diversify available habitat.
- Chippewa National Forest (CNF) has implemented a long-term habitat improvement project by implementing small-scale, frequent harvests (<5 acres, 5-year intervals) adjacent to hunter walking trails.
- The goal of this project is to create and maintain a diverse matrix of habitat that is suitable for Ruffed Grouse while supporting a diverse forest bird community.

Study objectives

- Characterize changes in Ruffed Grouse abundance and breeding bird communities before and after harvest treatments at four hunter walking trail locations.

Management objectives

To promote heterogeneous forest matrices by implementing small-scale, frequent harvests at four hunter walking trail locations in CNF.

- Orange polygons were harvested in 2021.
- Yellow polygons will be harvested in 2026.

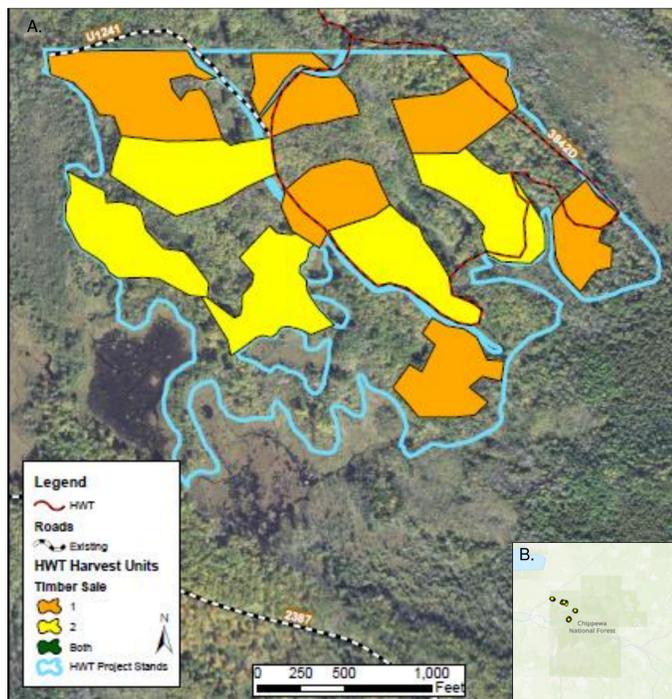


Figure 1. A.) Morph Meadows Hunter Walking Trail forest management design, B.) Hunter Walking Trail study locations.

Bird survey methods

Line Transect Surveys

- Early morning surveys along hunter walking trail study areas twice per year.
- **Late April:** Document Ruffed Grouse and American Woodcock locations and abundance.
- **Early June:** Songbird diversity and abundance

Automated Recording Units

- Record at sunrise and sunset April - June to document bird activity throughout the breeding season.

Pre-harvest results

Site	Pre-harvest surveys		Post-harvest surveys
	2020 Ruffed Grouse / 100 m	2021 Ruffed Grouse / 100 m	Predicted Ruffed Grouse / 100 m
Carter Lake	0.14	0.12	↑
Morph Meadows	0.10	0.04	
Tower Lake	0.19	0.15	
Webster Lake	0.21	0.15	

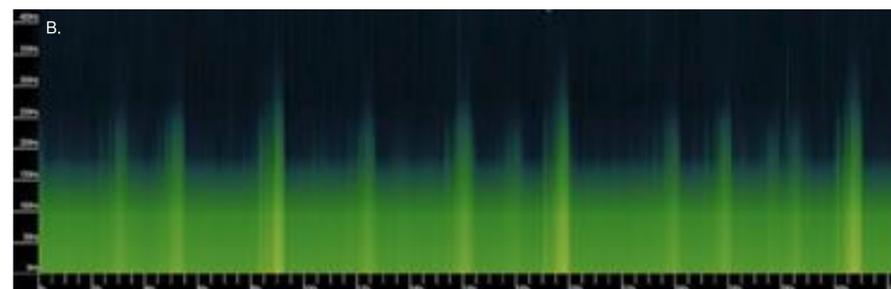
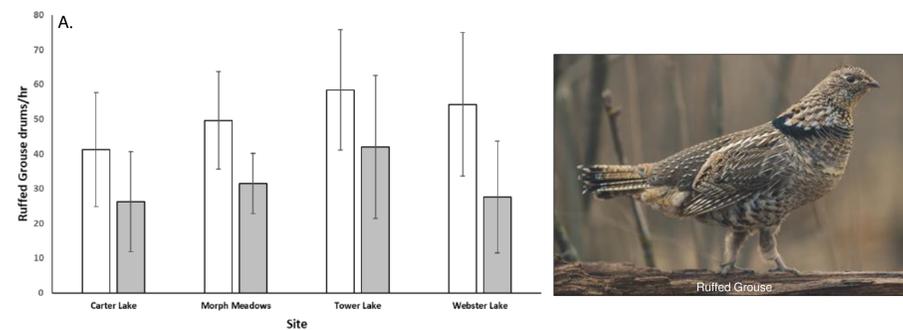


Figure 2. A.) Average Ruffed Grouse drums per hour for each site in 2020 (white) and 2021 (gray). Error bars represent standard deviations. B.) Spectrograph of three drumming Ruffed Grouse.

Pre-harvest Results

Bird species	Pre-harvest surveys (abundance / 100 m)	Predicted abundance post-harvest
Ovenbird	1.80	↓
Red-eyed Vireo	1.35	↓
Veery	0.66	↑
Least Flycatcher	0.51	↓
Golden-winged Warbler	0.22	↑
American Woodcock	0.01	↑



Management implications

- Forest management provides an important opportunity to conserve and cultivate critical habitat for species of management and conservation concern.
- A portion of this habitat improvement project was facilitated via a stewardship agreement between Chippewa National Forest and Ruffed Grouse Society. The projects sold at a premium and without issue.
- Stewardship agreements can be used to build partnerships and achieve land management objectives.
- Pre- and post-monitoring provides important information about multi-species benefits of forest management.