



## Ruffed Grouse Drumming Survey 2020

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### Overview

Ruffed grouse are identified as a Species of Greatest Conservation Need in North Carolina's 2015 Wildlife Action Plan. They are one of only three resident game species with this designation. As such, information about grouse in North Carolina is vitally important and North Carolina Wildlife Resource Commission (NCWRC) staff strive to make the most of our time and resources.

Since 2002, we have surveyed drumming grouse across all Ranger Districts of the Nantahala and Pisgah National Forests (Figure 1). This survey was initiated in 2002, with the goal to provide precise annual estimates of grouse abundance. In 2018, we expanded the survey to include survey routes on four state-owned Game Lands and a walking survey on Pond Mountain Game Land. Routes are established throughout the region such that they offer reliable and representative data on these areas and lead to a better understanding of regional trends in grouse populations.

### **METHODS**

#### **Driving Routes**

Driving routes are situated along roads that receive little to no vehicle traffic. Listening stations are established (marked with GPS units and yellow paint) every 0.5 miles. Surveys begin 30 minutes before sunrise and continue for up to 3 hours. Observers listen for drumming grouse at each station for four minutes. In addition to the number of drumming grouse heard, observers make note of the number of turkeys gobbling and the number of grouse and turkeys sighted while traveling along the route. Basic weather parameters are collected at the beginning and end of the survey. From 2002 through 2018 we surveyed routes once each year. In 2019 and 2020, we surveyed each route on two separate mornings, reversing the direction of travel on the second morning for most routes.

#### **Walking Route**

Walking routes have been established on Pond Mountain Game Land and Sandy Mush Game Land. These routes were surveyed by observers walking sections of approximately two miles each. Surveys began no earlier than 30 minutes before sunrise and continued for up to 3 hours. Observers adjusted their walking pace based on habitat conditions (i.e. walk more slowly in forests and suitable habitat than in open fields) and generally covered 1 – 2 miles per hour. Observers noted locations of drumming males on a map and also noted the time, number of drums heard, and other related information.

#### **Survey period and weather**

Our goal is to complete drumming grouse surveys each year in the two-week period immediately prior to the opening of the spring turkey hunting season. Grouse are expected to be drumming at this time and conflicts with hunters are avoided. To the extent possible, surveys are conducted on days with light winds and clear skies. Surveys are not conducted during periods of rain or snow. This year all routes (both driving and walking) were surveyed between March 25 and April 11, 2020.

## **RESULTS**

In 2020, NCWRC biologists and technicians completed the following:

- 1) surveyed 24 driving routes (417 stations) on two mornings on Nantahala - Pisgah National Forests,
- 2) surveyed four driving routes (64 stations) on two mornings on state-owned Game Lands in the southern mountains, and
- 3) surveyed the 10.8-mile walking survey on Pond Mountain Game Land once and a 2.3-mile walking survey on Sandy Mush Game Land twice.

### **Nantahala – Pisgah National Forest**

In 2020, ruffed grouse were monitored by counting drumming males at 417 listening stations distributed across 24 routes on the Nantahala - Pisgah National Forests. All stations were surveyed twice. These National Forests are distributed throughout the southern mountains and represent a great deal of potential grouse habitat and hunting opportunity. A total of 117 drumming males was heard from the 834 station-surveys yielding an average of 0.14 grouse drumming/station (95% confidence interval 0.11 to 0.17 grouse/station). While this is slightly higher than drumming rates observed for the last two years, the overall trend in the grouse population has been declining over much of the last two decades (Figure 2).

### **State-owned Game Lands**

NCWRC biologists and technicians surveyed routes twice each on Cold Mountain (24 stations), Needmore (12 stations), Sandy Mush (10 stations), and Silver (18 stations) Game Lands. In total, 22 drumming grouse were heard. Thus, the overall average number of grouse drumming per station on these state-owned Game Lands was 0.17 grouse/station (95% confidence interval 0.12 to 0.22 grouse/station) (Figure 3). This is somewhat higher than the previous the drumming rate observed the previous two years. However, the confidence intervals are wide and so this increase should be interpreted cautiously. We expect future years of drumming data to be important in identifying population trends on these areas.

### **Occupancy**

Surveying the driving routes twice (instead of only once as was done prior to 2019) can offer some additional insight into how much of the area is being used by grouse. Of the 481 stations that were surveyed on two separate mornings, 36 stations had drumming grouse the first morning only, 47 stations had drumming grouse the second morning only, 19 stations had drumming grouse both mornings, and 379 stations had no grouse drumming either morning. Thus, we detected drumming grouse at 102 different stations, representing 21.2% of the total stations. Surveying the stations additional times would likely increase the occupancy rate, but may be logistically difficult.

### **Walking Routes**

NCWRC biologists and technicians surveyed the 10.8-mile route on Pond Mountain Game Land one time and the 2.3-mile route on Sandy Mush Game Land twice. Assuming that drumming grouse can be heard from 1/8 of a mile, these routes gives the opportunity to detect grouse on approximately 2,000 acres. However, it is important to note that not all that area is potential grouse habitat. In some areas routes pass through open fields and mature forest. On Pond Mountain, we heard six grouse drumming and flushed one additional grouse. On Sandy Mush, we heard at least seven grouse drumming at unique locations, heard two grouse on the second morning that likely also were heard on the first morning, and also flushed four additional grouse. We plan to continue these walking surveys for a few more years in order to whether this technique offers worthwhile insight about grouse populations. If results are encouraging, we may establish similar walking routes on other areas.

# Grouse Surveys

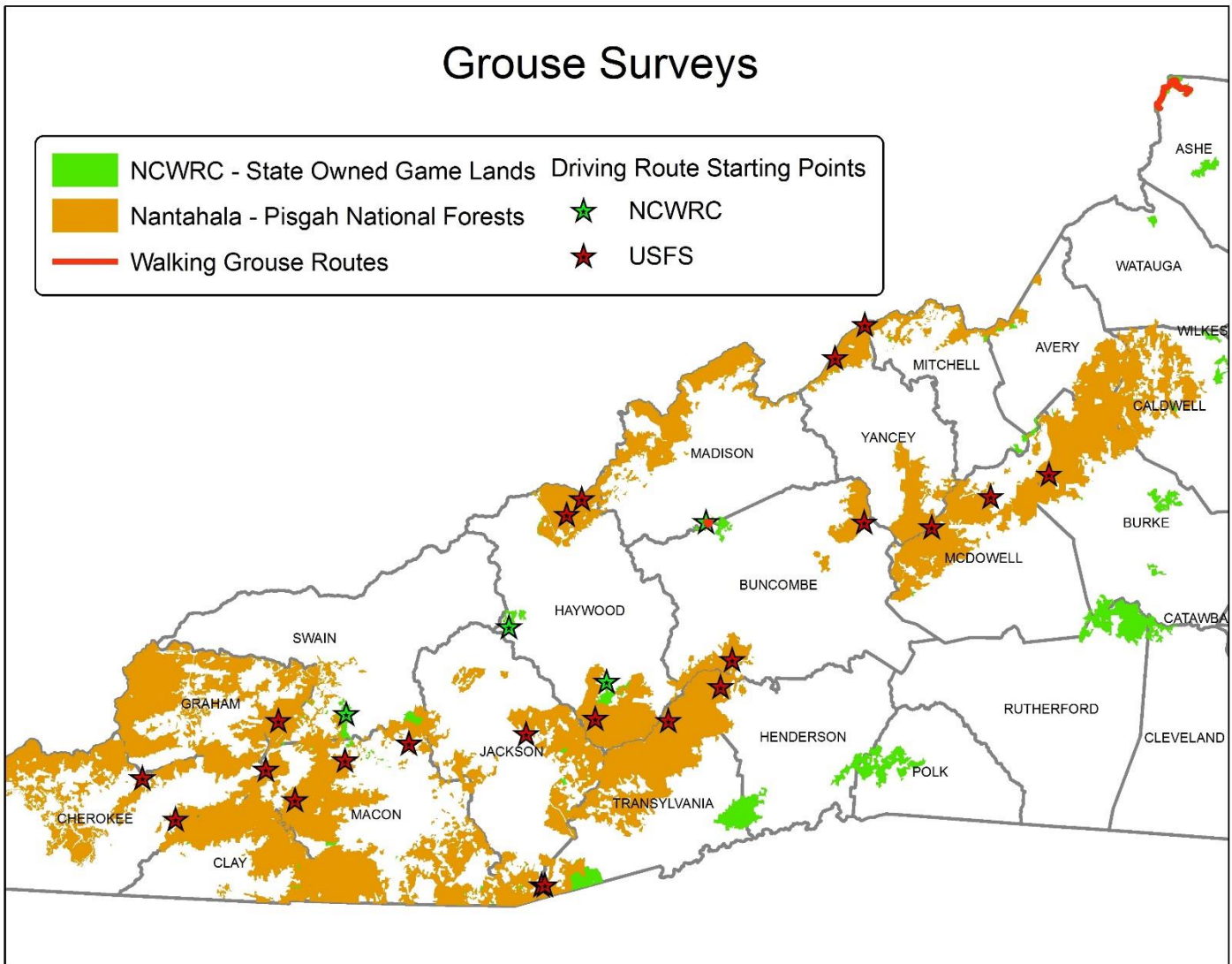


Figure 1. Locations of NCWRC grouse surveys on NCWRC Game Lands and Nantahala – Pisgah National Forests.

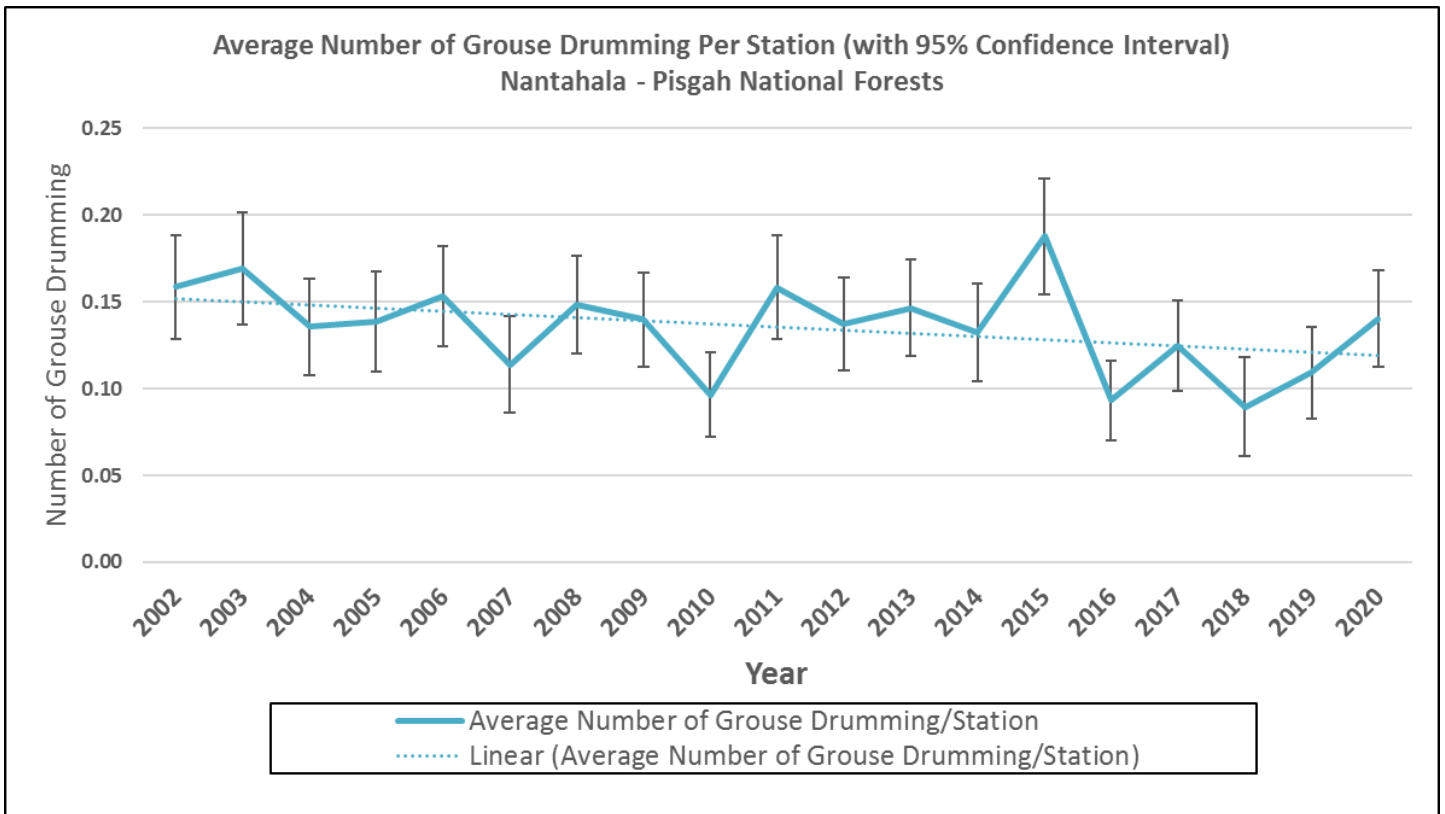


Figure 2. Average Number of Grouse Heard Drumming Per Station on Nantahala – Pisgah National Forests, North Carolina Grouse Drumming Survey, 2002-2020.

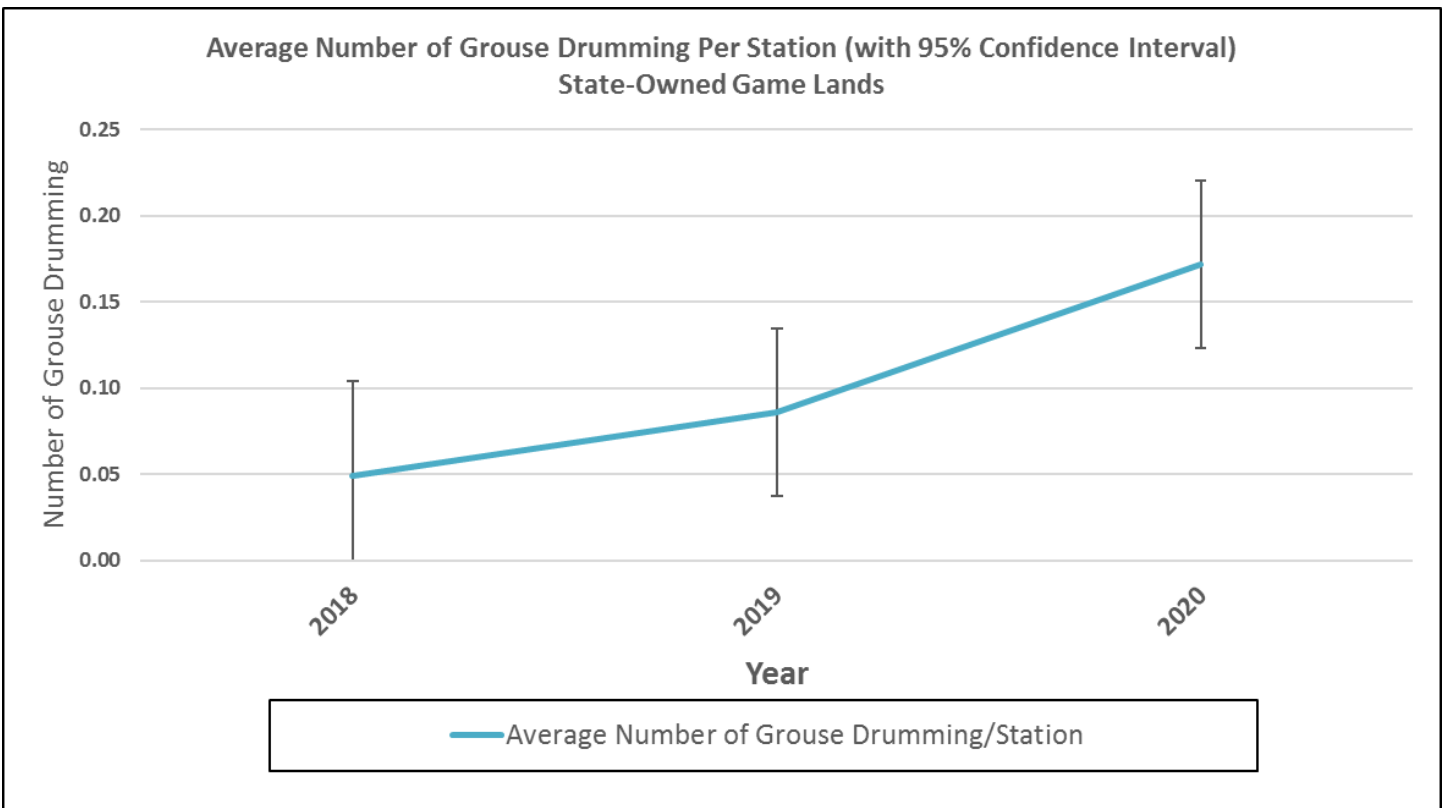


Figure 3. Average Number of Grouse Heard Drumming Per Station on State-Owned Game Lands, 2018-2020.