



## Ruffed Grouse Drumming Survey 2021

**Chris Kreh**, *NCWRC Upland Game Bird Biologist*  
Office: (336) 386-0892  
Mobile (336) 618-5749  
chris.kreh@ncwildlife.org



### 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 Resources Commission (NCWRC) staff strive to make the most of our time and survey effort.

Since 2002, we have surveyed drumming grouse across all Ranger Districts of the Nantahala and Pisgah National Forests (Figure 1). This survey began in 2002, with the goal of providing precise annual estimates of grouse abundance. In 2018, we expanded the survey to include routes on four state-owned Game Lands and a walking survey on Pond Mountain Game Land. In 2020, we established a walking route on Sandy Mush Game Land. In 2021, we established four driving routes along public roads in privately owned areas of Ashe and Alleghany counties. Routes are spread 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 on public lands are situated along roads that receive little to no vehicle traffic, with listening stations established (marked with GPS units and yellow paint) every 0.5 miles. Driving routes in the privately owned lands of Ashe and Alleghany counties follow lightly traveled public roads such that listening stations are located in forested areas but away from streams (due to stream noise). 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 each day. From 2002 through 2018 we surveyed routes once each year. Since 2019, we have 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 and Sandy Mush Game Lands. Routes are surveyed by observers walking sections of approximately two miles each. Surveys begin no earlier than 30 minutes before sunrise and continue for up to 3 hours. Observers adjust their walking pace based on habitat conditions (i.e. walk more slowly in forests and suitable habitat than in open fields) and generally cover 1 – 2 miles per hour. Observers note locations of drumming males on a map and also note 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) on public lands were surveyed between March 23 and April 14, 2021. Surveys continued until April 22<sup>nd</sup> on public road routes in Ashe and Alleghany counties, where conflicts with turkey hunters are not an issue.

## **RESULTS**

In 2021, NCWRC biologists and technicians completed the following:

- 1) surveyed 23 driving routes (402 stations), each completed twice, on Nantahala - Pisgah National Forests,
- 2) surveyed four driving routes (64 stations), each completed twice, on state-owned Game Lands in the southern mountains,
- 3) surveyed four driving routes (80 stations), each completed twice, along public roads in privately owned areas in Ashe and Alleghany counties.
- 4) surveyed the 10.8-mile walking survey on Pond Mountain Game Land once and the 3.2-mile walking survey on Sandy Mush Game Land twice.

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

In 2021, ruffed grouse were monitored by counting drumming males at 402 listening stations distributed across 23 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 81 drumming males was heard from the 804 station-surveys yielding an average of 0.10 grouse drumming/station (95% confidence interval 0.08 to 0.12 grouse/station). This is slightly lower than the drumming rate observed in 2020 and continues to suggest that the grouse population has been declining over much of the last two decades (Figure 2). The Shinbone Basin route (19 stations) in Mitchell County on the Appalachian Ranger District was not surveyed this year due to road conditions that did not allow for vehicle traffic during the survey period.

### **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, 11 drumming grouse were heard. Thus, the overall average number of grouse drumming per station on these state-owned Game Lands was 0.09 grouse/station (95% confidence interval 0.04 to 0.14 grouse/station) (Figure 3). This is considerably lower than the drumming rate observed in 2020, but the same as observed in 2019. However, the confidence intervals are wide and so these results should be interpreted cautiously. We expect future years of drumming data to be important in identifying population trends on these areas.

### **Private-Land Routes in Ashe and Alleghany Counties**

NCWRC biologists listened for drumming males at 80 stations along public roads in Ashe and Alleghany counties. All stations were surveyed twice. Drumming grouse were heard at two stations. Thus, the observed drumming rate was 0.013 grouse/station (95% confidence interval 0.0 to 0.06 grouse/station). This information suggests that fewer grouse occur across much of the private landscape as compared to public lands. However, it is important to note that this is the first year these routes have been run, they are in a different part of the region, and the number of stations was considerably less than the number of stations surveyed on public lands.

### **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 466 stations on public lands that were surveyed on two separate mornings, 28 stations had drumming grouse the first morning only, 35 stations had drumming grouse the second morning only, 12 stations had drumming grouse both mornings, and 391 stations had no grouse drumming either morning. Thus, we detected drumming grouse at 75 different stations, representing 16.0% of the total stations. By comparison, the percentage of stations on public lands in 2019 and 2020 with grouse drumming was 14.8% and 21.2% respectively. Also, for comparison, drumming grouse were detected at only two of the 80 stations (2.5%) on the private-land routes in Ashe and Alleghany counties. 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. The 3.2-mile route on Sandy Mush Game Land was surveyed twice. Assuming that drumming grouse can be heard from 1/8

of a mile, these routes give the opportunity to detect grouse on a considerable amount of acreage. However, it is important to note that not all the area is potential grouse habitat. In some areas routes pass through open fields and mature forest. On Pond Mountain, we heard 4 grouse drumming and flushed one additional grouse. This is comparable to the five or six grouse we have detected on the Pond Mountain walking route each of the previous three years. On Sandy Mush Game Land, two drumming grouse were heard and one additional grouse was flushed this year, which was considerably less than seven drumming grouse and four additional grouse flushed in 2020. As they provide insight into the local grouse populations on these areas, we plan to continue these walking surveys in the future.

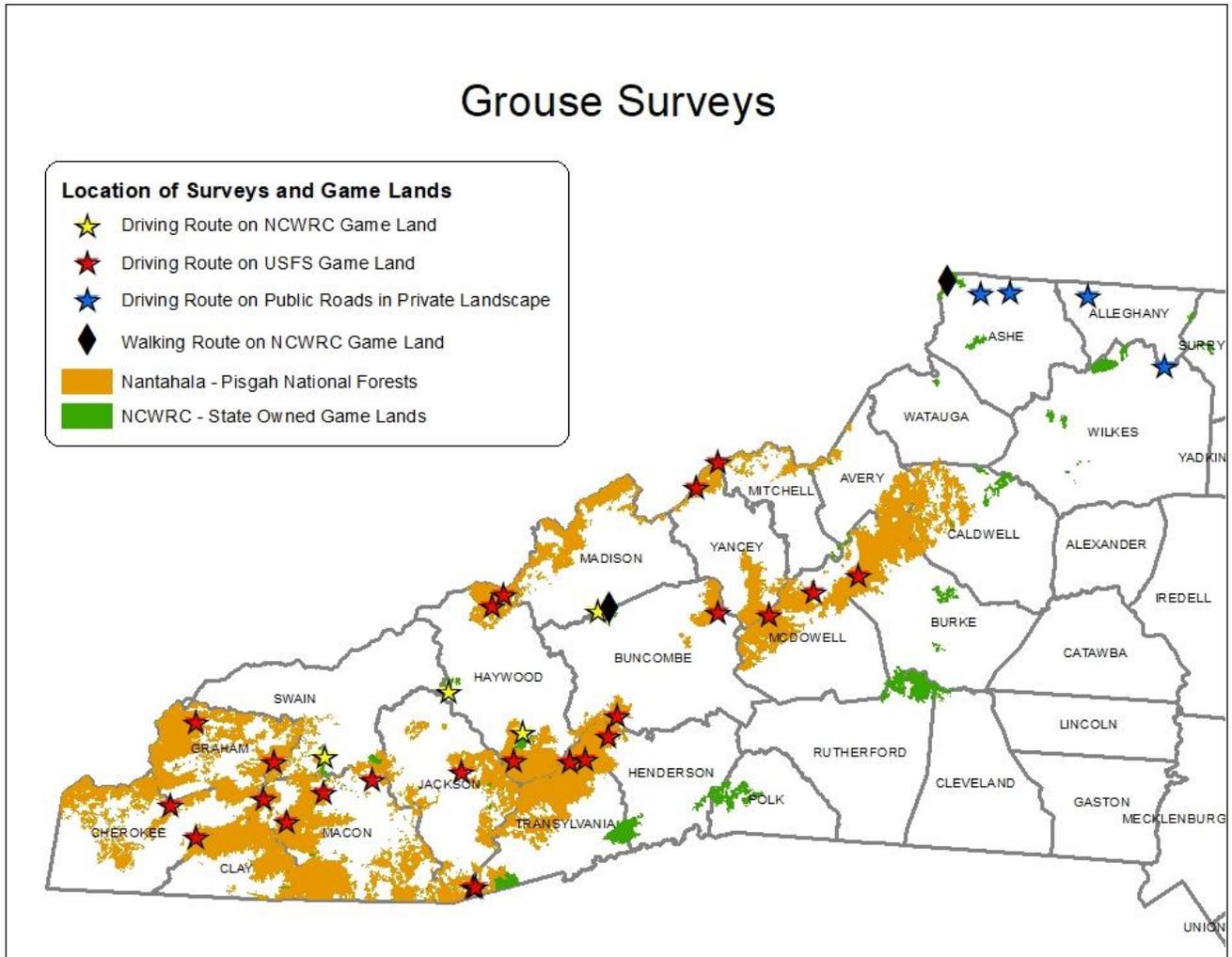


Figure 1. Locations of NCWRC grouse surveys on NCWRC Game Lands and Nantahala – Pisgah National Forests.

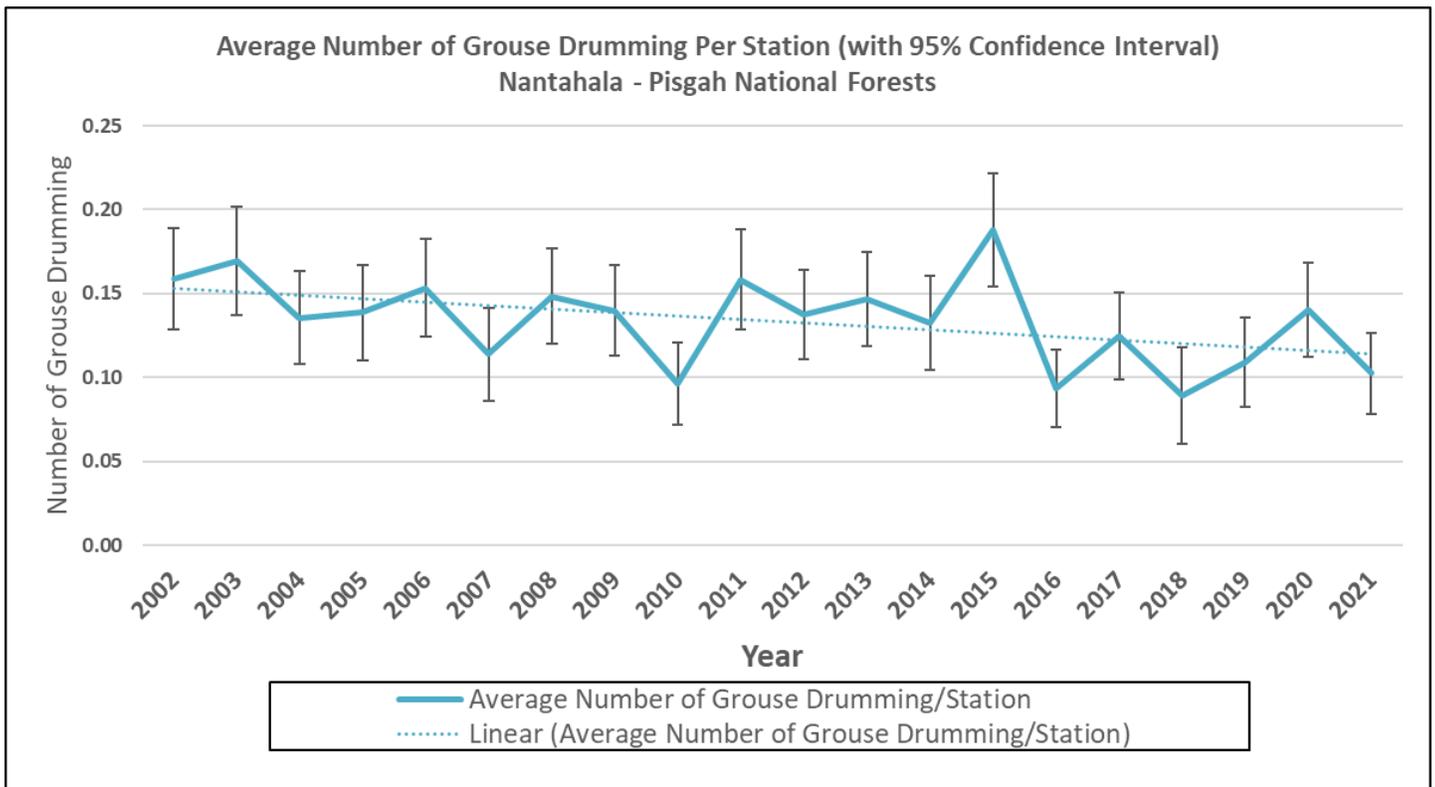


Figure 2. Average Number of Grouse Heard Drumming Per Station on Nantahala – Pisgah National Forests, North Carolina Grouse Drumming Survey, 2002-2021.

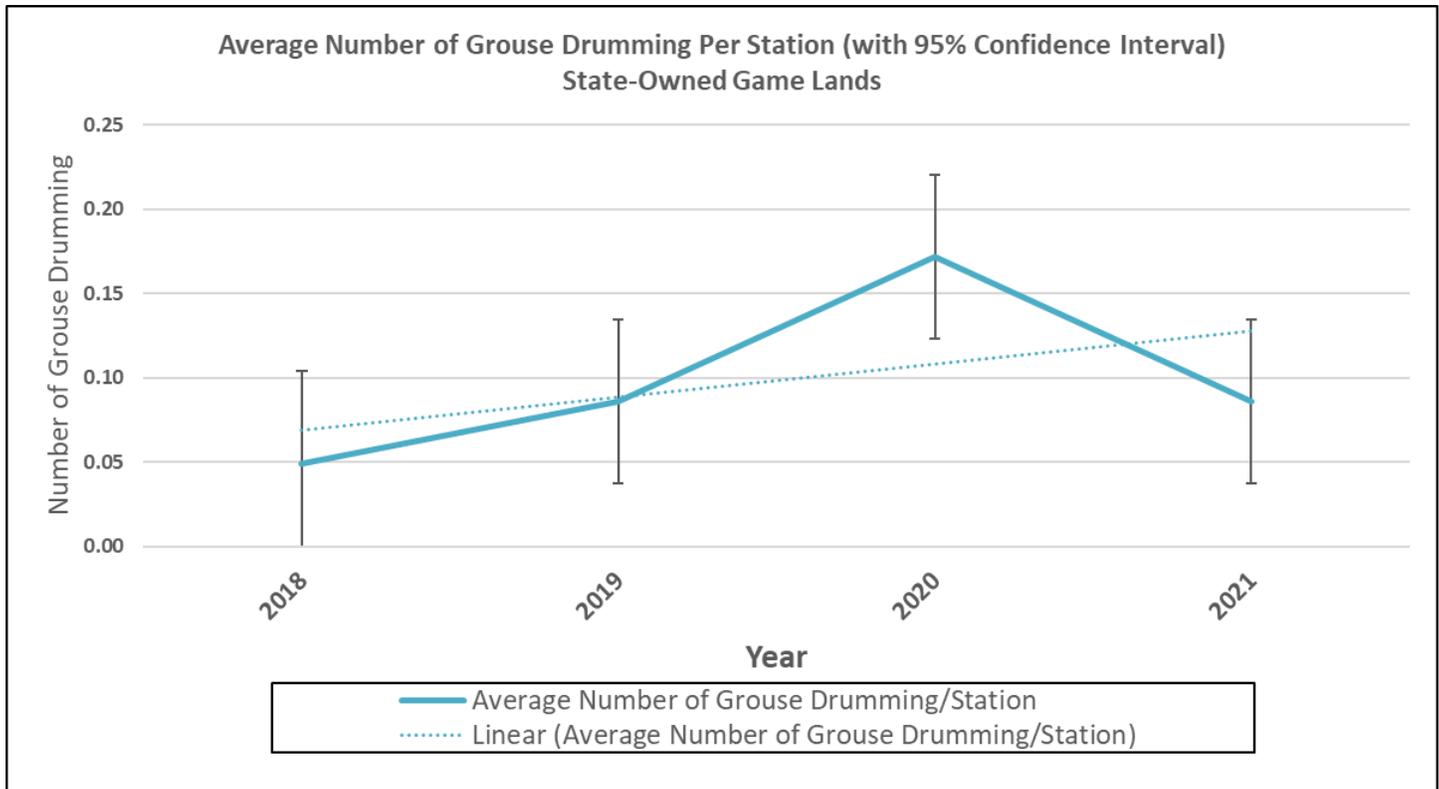


Figure 3. Average Number of Grouse Heard Drumming Per Station on State-Owned Game Lands, 2018-2021.