



## 2016-17 North Carolina Avid Grouse Hunter Survey

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Since 1984, the North Carolina Wildlife Resources Commission (NCWRC) has conducted an annual avid grouse hunter survey to estimate long term grouse hunting trends and provide annual insight into avid grouse hunting demographics throughout the mountains of North Carolina. Volunteer grouse hunters participate by recording and submitting their annual hunting activity throughout the season. Grouse hunting activity is recorded by county and landownership type (Private Land or Game Land) within the two grouse management regions (Northern Mountains and Southern Mountains) (Fig. 1). Reported hunting trips typically consist of a single day per hunting party.

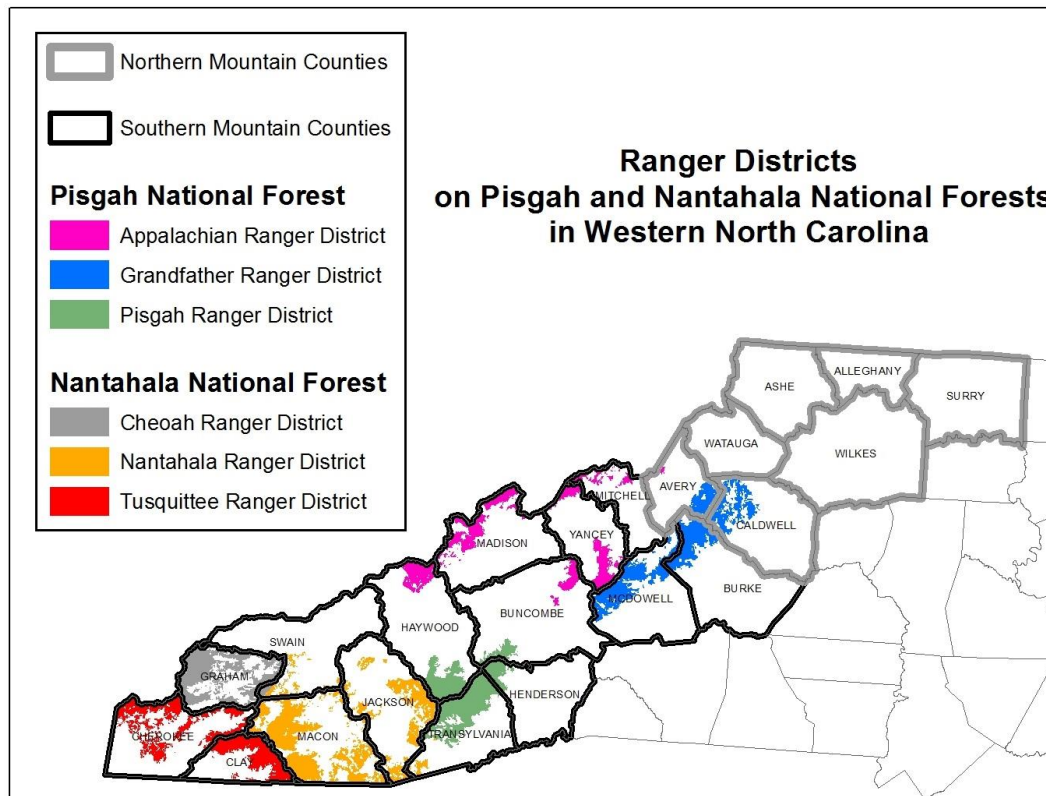


Figure 1. Grouse Management Regions and Ranger Districts on Pisgah and Nantahala National Forests in Western North Carolina.

Sixty-two avid grouse hunters reported information during the 2016-17 season, providing grouse hunting statistics for 692 hunting trips (Fig. 2). Hunt information was reported from 20 different counties, though some counties had relatively few reports (Fig. 3). With 51 hunts, Ashe County was the most reported county in the Northern Mountains, followed by Watauga County with 34 hunts. With 108 hunts, Macon County was the most reported county in the Southern Mountains, followed by Haywood (80 hunts) and Madison (61 hunts) counties. The gradual annual decline of total reported grouse hunting trips has primarily been a function of fewer survey respondents and fewer hunting trips taken per hunter. Presumably this is due to fewer grouse and poor hunting in recent years.

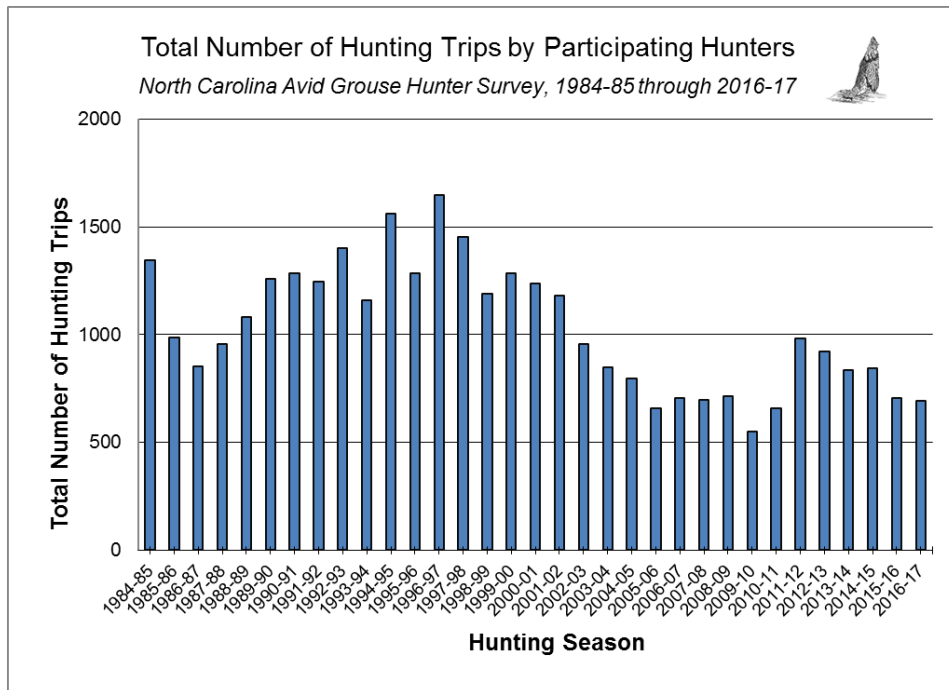


Figure 2. Total number of reported hunts by volunteer avid grouse hunter survey participants, 1984-85 through 2016-17.

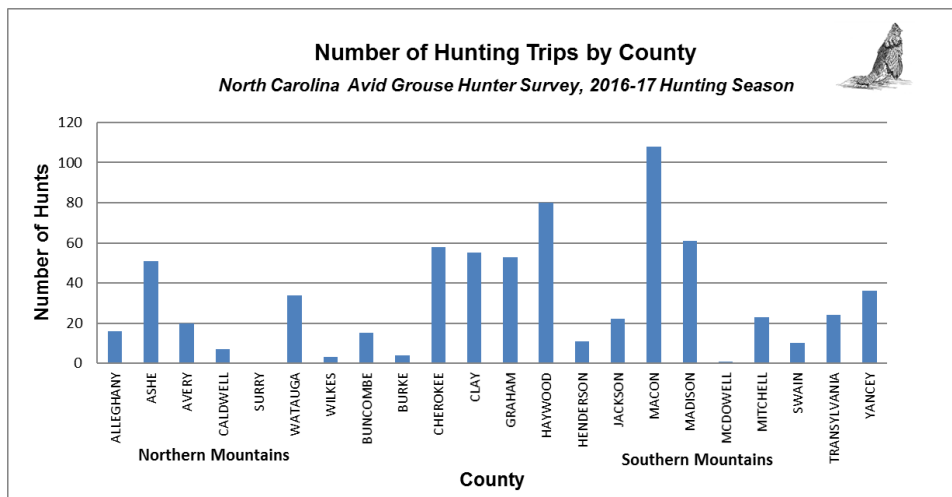


Figure 3. Total number of reported hunts by county during the 2016-17 hunting season by avid grouse hunter survey participants.

During the 2016-17 season, avid grouse survey participants hunted an average of 11.2 times (Fig.4). It is clear that participants are now hunting considerably fewer times than during the 1980's and 1990's. The average length of a hunting trip has declined somewhat over that time period as well, with an average trip length of 3.4 hours reported during the 2016-17 season (Fig 5). This may be a result of aging hunters, poor hunting, or a combination of both.

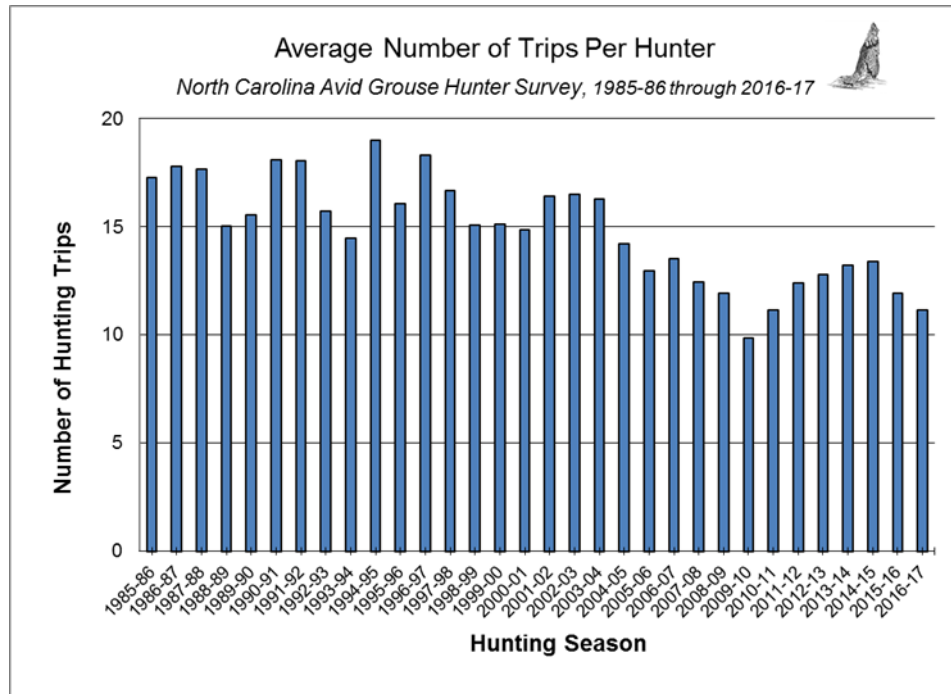


Figure 4. Average number of hunting trips per hunter based on avid grouse hunter survey participants, 1985-86 through 2016-17.

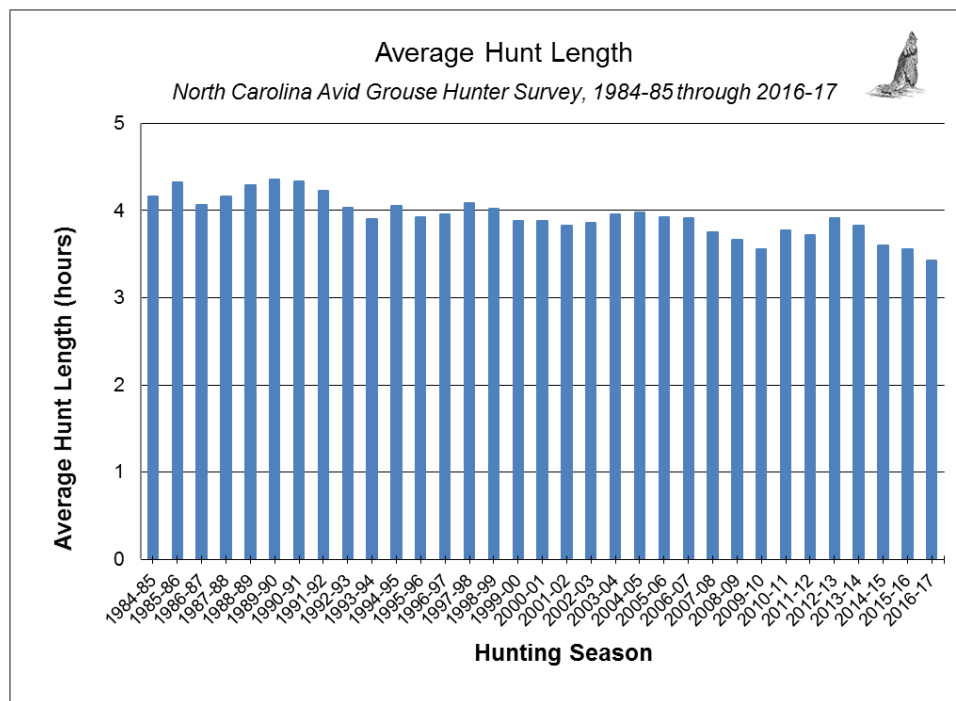


Figure 5. Average length (hours) of hunting trips of avid grouse hunter survey participants, 1984-85 through 2016-17.

Flush rates are presented both by hunting trip and by hours hunted in this report. Flush rates by hour may provide a more precise index to grouse abundance, while flush rates by hunting trip are more applicable from grouse hunting perspectives. However, we recognize that hunters will change their hunting locations over time to areas with relatively more grouse. This selective

hunting behavior has a tendency to skew trend estimates such that they may not represent actual annual abundances or changes in abundance across the full landscape.

The avid grouse hunter survey has documented overall long term declines in hourly flush rates. While some years have shown slight increases, the overall trend has been a steady decline. This has been true on both private land and Game Lands and in both the northern and southern mountain regions. In 2016-17 flush rates continued to be higher on private land than on public game lands (Fig. 6). Historically more grouse were reported in the southern mountain region, however flush rates reported from the northern mountains have been very comparable or slightly higher for the last decade (Fig. 7). This may be a result of declining grouse numbers on Game Lands (primarily National Forests) where most of the hunts in southern mountains take place.

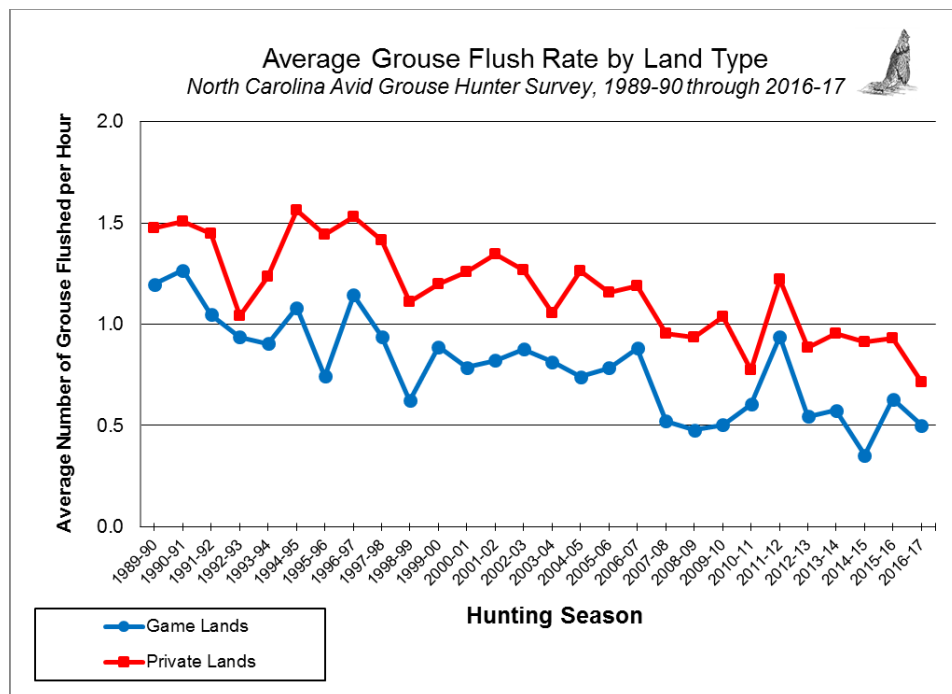


Figure 6. Average grouse flushed per hour by land type by avid grouse hunter survey participants, 1989-90 through 2016-17.

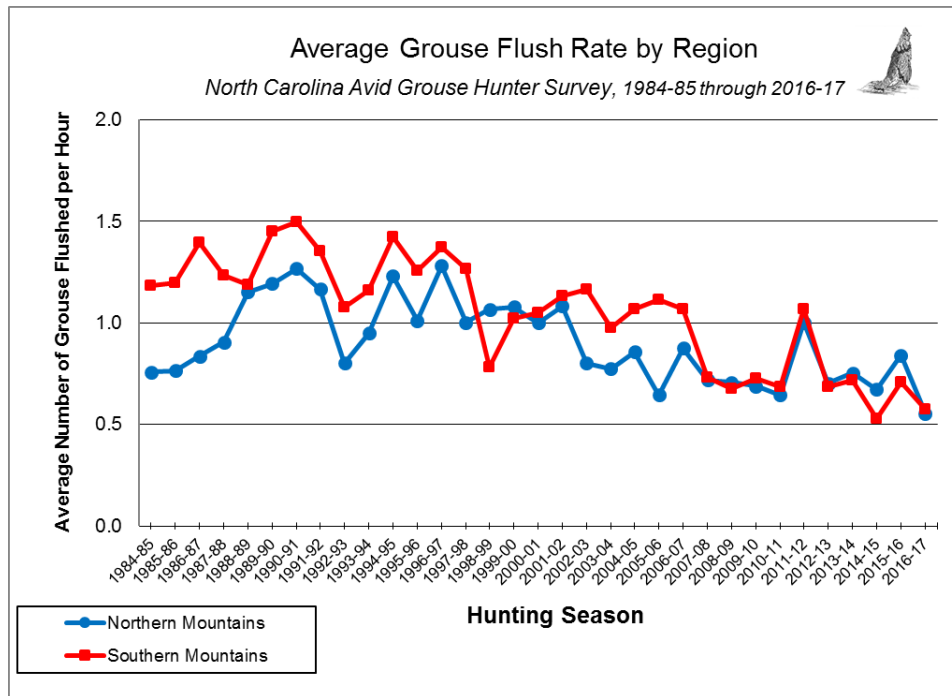


Figure 7. Average grouse flushed per hour by region by avid grouse hunter survey participants, 1984-85 through 2016-17.

Grouse hunting during the 2016-17 season was poor in comparison to what hunters encountered when this survey began in the 1980's. Measures of grouse flushed, bagged, and numbers of hunts with no flushes have been somewhat consistent and very low for the last decade. Since 2007-08, the number of grouse flushed per trip has generally been between 2.0 and 3.0 (Fig. 8), with 0.2 to 0.4 grouse bagged per trip (Fig. 9). This roughly equates to one grouse killed for every 3 to 5 hunting trips. Likewise, since 2007-08, approximately one hunting trip out of every three results in no grouse being flushed (Fig. 10).

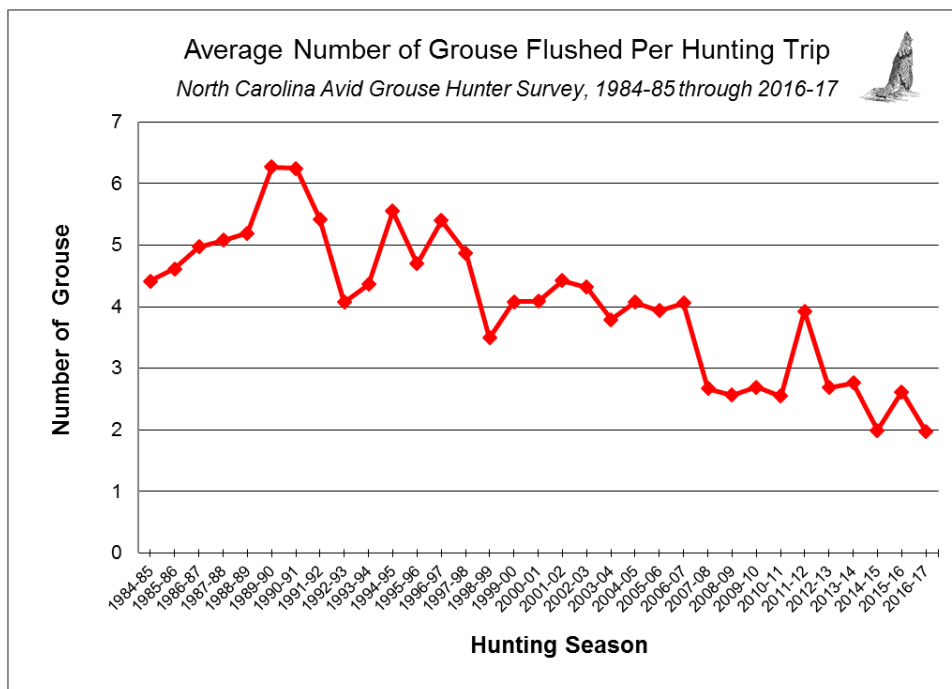


Figure 8. Average number of grouse flushed per hunting trip by avid grouse hunters, 1984-85 through 2016-17.

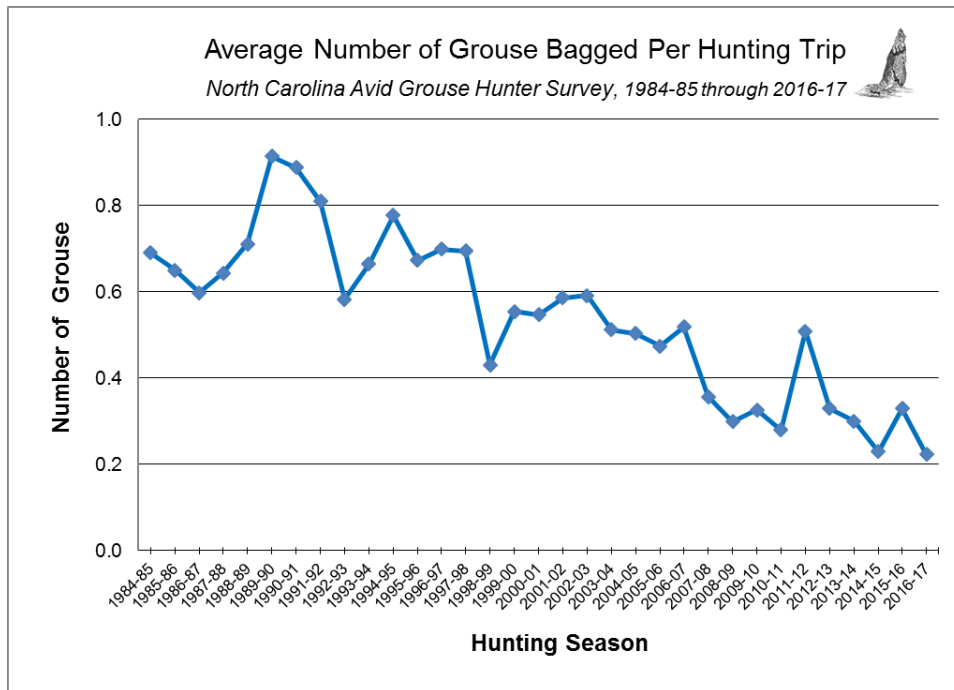


Figure 9. Average number of grouse bagged per hunting trip by avid grouse hunters, 1984-85 through 2016-17.

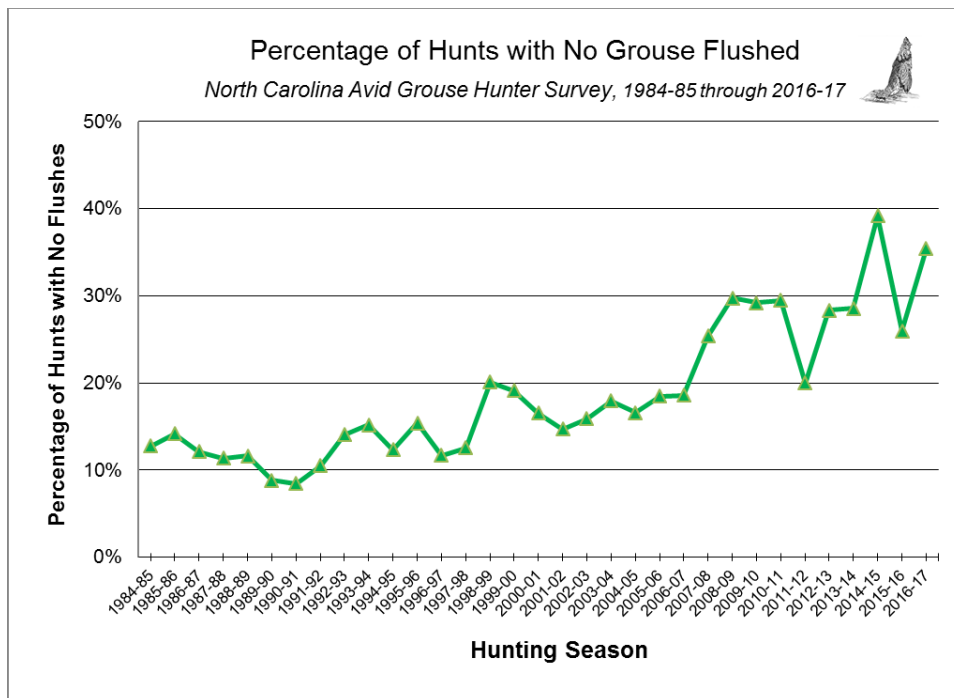


Figure 10. Percent of reported grouse hunting trips with no flushes by avid grouse hunters, 1984-85 through 2016-17.

Not surprisingly, during the 2016-17 hunting season, avid hunters reported more hunting activity later in the winter after big game hunting seasons have closed (Fig. 11). Flush rates were noticeably higher in February with an average of 2.3 flushes per trip in that month (Fig. 12). Hunters reported killing 154 of the 1,360 grouse they flushed, for a harvest rate of 11%.

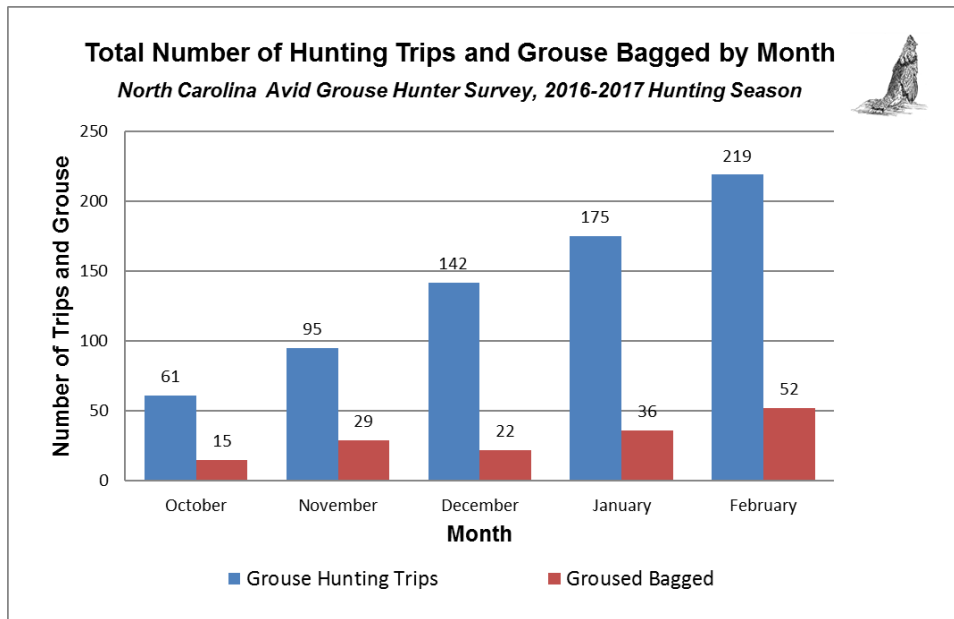


Figure 11. Total reported grouse hunting trips and harvests during the 2016-17 hunting season by avid grouse hunter survey participants.

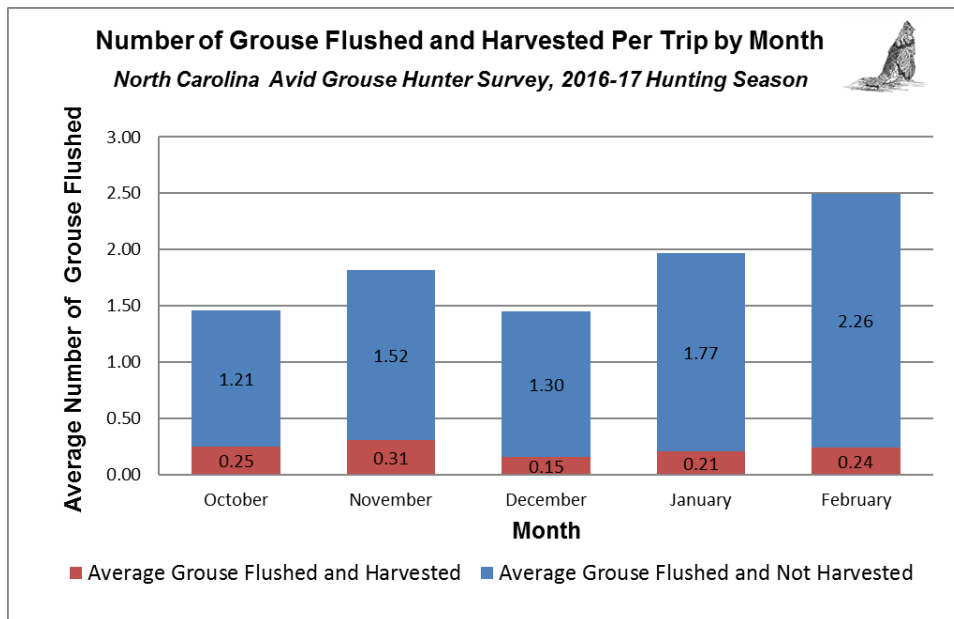


Figure 12. Average number of grouse flushed and harvested per hunting trip by month during the 2016-17 hunting season by avid grouse hunter participants.

*Funding for the avid grouse hunter survey report was partially provided through a Pittman-Robertson Wildlife Restoration Multi-state Grant. The Federal Aid in Wildlife Restoration Act, popularly known as the Pittman-Robertson Act, was approved by Congress on September 2, 1937, and begin functioning July 1, 1938. The purpose of this Act was to provide funding for the selection, restoration, rehabilitation and improvement of wildlife habitat, wildlife management research, and the distribution of information produced by the projects. The Act was amended October 23, 1970, to include funding for hunter training programs and the development, operation and maintenance of public target ranges.*

*Funds are derived from an 11 percent Federal excise tax on sporting arms, ammunition, and archery equipment, and a 10 percent tax on handguns. These funds are collected from the manufacturers by the Department of the Treasury and are apportioned each year to the States and Territorial areas (except Puerto Rico) by the Department of the Interior on the basis of formulas set forth in the Act. Funds for hunter education and target ranges are derived from one-half of the tax on handguns and archery equipment.*

*Each state's apportionment is determined by a formula which considers the total area of the state and the number of licensed hunters in the state. The program is a cost-reimbursement program, where the state covers the full amount of an approved project then applies for reimbursement through Federal Aid for up to 75 percent of the project expenses. The state must provide at least 25 percent of the project costs from a non-federal source*





Appendix I. Reported hunting activity from avid grouse hunter survey respondents, 1984-85 through 2016-17 hunting seasons.

Year	# Avid Hunter Respondents	# Hunting Trips Reported	# Hunting Hours Reported	Respondent Age	Trips/Hunter	Hunting Hours/Trip	# Grouse Flushed Reported	Grouse Flushed/Trip	Grouse Flushed/Hour	Grouse Flushed - Northern Mountains	Grouse Flushed - Southern Mountains	Grouse Flushed - Game Land	Grouse Flushed - Private Land	# Grouse Harvests Reported	Grouse Harvested/Trip	Grouse Harvested/Hour	# Hunts No Grouse Flushed	% Hunts No Grouse Flushed
1984-85	*	1,347	5,606	44	*	4.16	5,962	4.42	1.05	0.76	1.18			933	0.69	0.17	172	12.79%
1985-86	57	985	4,284	44	17.28	4.33	4,553	4.62	1.07	0.76	1.20			641	0.65	0.15	140	14.17%
1986-87	48	854	3,474	43	17.79	4.07	4,240	4.97	1.20	0.84	1.39			512	0.60	0.15	104	12.13%
1987-88	54	954	3,973	41	17.67	4.16	4,841	5.08	1.13	0.90	1.24			613	0.64	0.15	109	11.39%
1988-89	72	1,082	4,639	43	15.03	4.29	5,618	5.19	1.18	1.15	1.19			769	0.71	0.17	126	11.65%
1989-90	81	1,259	5,479	44	15.54	4.35	7,890	6.27	1.38	1.19	1.45	1.20	1.48	1,151	0.91	0.21	111	8.82%
1990-91	71	1,286	5,576	45	18.11	4.34	8,036	6.25	1.42	1.27	1.49	1.27	1.51	1,142	0.89	0.20	109	8.48%
1991-92	69	1,244	5,258	45	18.03	4.23	6,749	5.43	1.28	1.17	1.35	1.05	1.45	1,008	0.81	0.19	131	10.53%
1992-93	89	1,401	5,842	46	15.74	4.03	5,706	4.07	0.99	0.80	0.94	0.90	1.23	769	0.66	0.17	176	15.20%
1993-94	80	1,158	4,525	48	14.48	3.91	5,055	4.37	1.10	0.96	1.16	1.08	1.56	1,213	0.78	0.19	192	12.32%
1994-95	82	1,559	6,312	49	19.01	4.05	8,653	5.55	1.36	1.23	1.42	1.08	1.44	865	0.67	0.17	198	15.41%
1995-96	80	1,285	5,042	50	16.06	3.92	6,038	4.70	1.18	1.01	1.26	0.74	1.44	1,152	0.70	0.18	193	11.71%
1996-97	90	1,648	6,524	50	18.31	3.96	8,898	5.40	1.35	1.28	1.37	1.15	1.53	1,152	0.70	0.18	182	12.54%
1997-98	87	1,451	5,932	50	16.68	4.09	7,071	4.87	1.20	1.00	1.27	0.94	1.41	1,008	0.69	0.17	239	20.08%
1998-99	79	1,190	4,788	51	15.06	4.02	4,160	3.50	0.87	1.07	0.78	0.62	1.11	512	0.43	0.11	239	20.08%
1999-00	85	1,286	4,987	50	15.13	3.88	5,245	4.08	1.04	1.08	1.02	0.89	1.20	713	0.55	0.14	246	19.13%
2000-01	83	1,235	4,792	53	14.88	3.88	5,050	4.09	1.03	1.00	1.05	0.79	1.26	676	0.55	0.14	204	16.52%
2001-02	72	1,181	4,519	53	16.40	3.83	5,228	4.43	1.12	1.08	1.13	0.82	1.35	692	0.59	0.15	174	14.73%
2002-03	58	956	3,686	55	16.48	3.86	4,128	4.32	1.08	0.80	1.17	0.88	1.27	565	0.59	0.15	152	15.90%
2003-04	52	847	3,355	54	16.29	3.96	3,212	3.79	0.93	0.77	0.98	0.81	1.05	434	0.51	0.13	152	17.95%
2004-05	56	795	3,160	54	14.20	3.97	3,238	4.07	1.01	0.86	1.07	0.74	1.26	400	0.50	0.13	132	16.60%
2005-06	51	660	2,590	55	12.94	3.92	2,601	3.94	0.97	0.65	1.12	0.79	1.16	313	0.47	0.12	122	18.48%
2006-07	52	704	2,751	56	13.54	3.91	2,855	4.06	1.02	0.88	1.07	0.88	1.19	365	0.52	0.13	131	18.61%
2007-08	56	697	2,616	55	12.45	3.75	1,864	2.67	0.73	0.72	0.73	0.52	0.96	249	0.36	0.10	177	25.39%
2008-09	60	716	2,623	56	11.93	3.66	1,835	2.56	0.68	0.71	0.68	0.48	0.94	214	0.30	0.08	213	29.75%
2009-10	56	551	1,960	53	9.84	3.56	1,483	2.69	0.72	0.69	0.72	0.50	0.77	184	0.33	0.09	161	29.23%
2010-11	59	658	2,482	54	11.15	3.77	1,677	2.55	0.67	0.64	0.68	0.60	0.77	184	0.28	0.07	194	29.48%
2011-12	79	983	3,657	56	12.40	3.72	3,867	3.93	1.06	1.00	1.07	0.94	1.22	500	0.51	0.14	203	20.00%
2012-13	72	920	3,603	56	12.78	3.92	2,475	2.69	0.69	0.70	0.68	0.54	0.88	303	0.33	0.08	261	28.37%
2013-14	63	833	3,186	56	13.22	3.82	2,303	2.76	0.72	0.75	0.72	0.58	0.95	249	0.30	0.08	238	28.57%
2014-15	62	843	3,037	56	13.38	3.60	1,678	1.99	0.55	0.67	0.53	0.35	0.91	190	0.23	0.06	330	39.15%
2015-16	59	704	2,503	58	11.93	3.56	1,842	2.62	0.74	0.84	0.71	0.63	0.93	229	0.33	0.09	183	25.99%
2016-17	62	692	2,375	59	11.16	3.43	1,360	1.97	0.57	0.55	0.58	0.50	0.71	154	0.22	0.06	245	35.40%