

2014-15 Ruffed Grouse Status Summary

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One of the Department's key mission statements is: to manage Virginia's wildlife and inland fish to maintain optimum populations of all species to serve the needs of the Commonwealth. This report focuses on the Department's efforts to monitor ruffed grouse populations this popular upland game bird appears to be in decline.

Fall and spring surveys were conducted to monitor ruffed grouse population trends. Surveys of grouse hunters and archery hunters were conducted in the fall. Grouse hunters provided a daily log of their hunting and also submitted feathers from birds they harvested so the age and sex of survey population could be determined. Also in the fall, archers participating in our Bow Hunter Survey reported the number of grouse they saw while deer hunting. The number of archers participating in the survey was impressive as they log many hours observing many species of wildlife from tree stands and ground blinds.

In the spring, a Roadside Drumming survey was conducted by staff from the Department of Game and Inland Fisheries (Department), US Forest Service, and volunteers. Roadside Drumming Surveys routes were 10 miles in length with the observer counting the number of drums heard during a 4 minute period at 1 mile intervals. The routes were randomly selected based on the criteria the US Fish and Wildlife Service use to locate woodcock singing ground surveys. Turkey hunters participating in the Department's Spring Gobbler Hunter Survey provided information on the number of grouse they hear drumming. This survey is based on the number of drummers gobbler hunters hear per hour during the first 2 weeks of the spring gobbler season. The time frame is believed to catch the peak of drumming in Virginia. In August, Department personnel reported the number of grouse broods and adults they saw during their normal work schedule; these data serve as an index to short and long-term recruitment trends.

For the reader, this report is presented in 3 sections. The first is an effort to evaluate breeding grouse populations and brood success through the spring and summer months of 2014 – prior to the 2014-15 grouse hunting season. Second, we examined data on fall and winter grouse populations using grouse observations reported by archers participating in our Bow Hunter

Survey and data from our Grouse Hunter Survey. And last, we provide a glimpse into the 2015-16 season by looking at results of the 2015 breeding population indices (2015 Roadside Drumming Survey and 2015 Spring Gobbler Hunter Survey).

Spring 2014 Breeding Population Indices

2014 Spring Drumming Survey. On an encouraging note, winter survival appeared to be good as the number of drumming grouse heard on Roadside Survey routes increased slightly in 2014. The 2013 and 2014 breeding population indices were the highest rates observed since the 2002 breeding season. The record number of drumming heard per route (1.9) was in 2001.

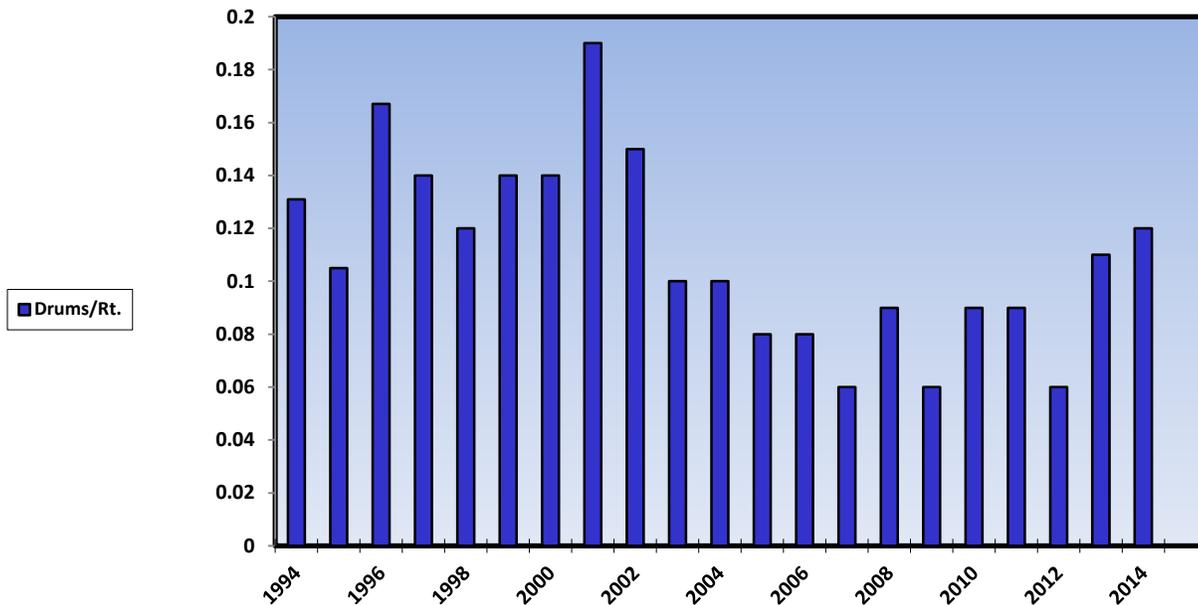


Figure 1. Average number of drums heard during roadside surveys in Virginia.

2014 Spring Gobbler Survey (SGS). Spring gobbler hunters reported hearing more grouse drumming (4.1) in 2014 than 2013 (3.4 per 100 hours of hunting). These measures (2013 and 2014) were higher than any spring survey dating back to 2002 (Fig. 2). The Roadside Drumming Survey and Spring Gobbler Hunter Survey general follow the same path and mirror each other, but not always. Agreement between independent surveys is very comforting and it is encouraging that these trends generally followed the same path.

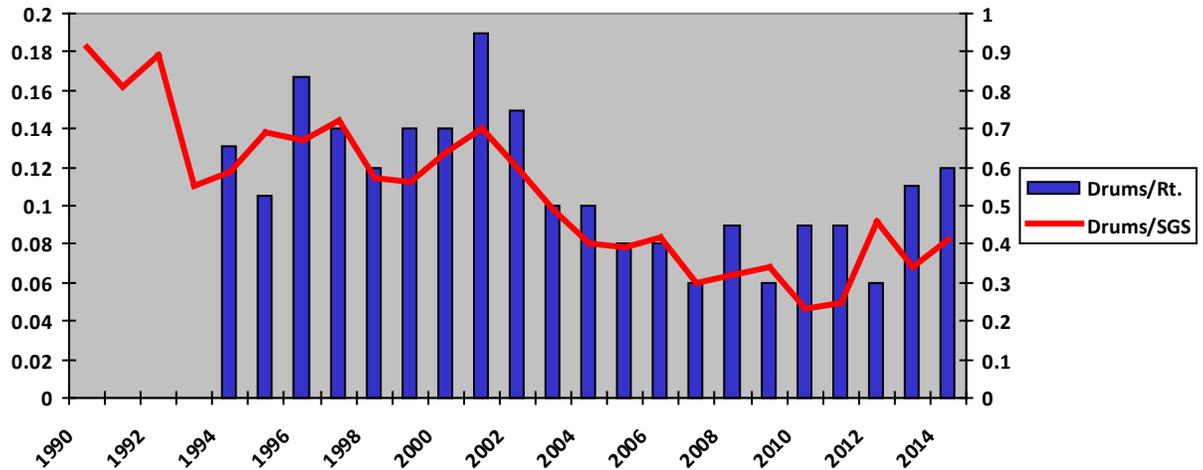


Figure 2. Drums heard during Roadside Drumming Surveys (Drums/Rt.) and grouse heard per hour by Spring Gobbler Hunter Survey (SGS) cooperators in the first two weeks of the spring gobbler season (Drums/SGS).

2014 Recruitment. There are many factors that influence reproduction. Hen condition, weather, and predation are thought to be the most important variables impacting reproduction. Hens in good physical condition tend to have more chicks that survive until fall. Birds tend to gain more weight and have higher body fat when acorn crops are available. Given the very poor mast conditions in the fall/winter of 2013-14, hens going into the 2014 reproductive season could have been stressed from the lack of acorns in their fall-winter diet. However, grouse do eat a variety of foods and having a diversity of soft mast can help soften the impact of an acorn failure. Unfortunately, hen condition is only one of many variables that influence reproductive success for ground nesting birds like grouse. Extended cold and wet weather are perhaps the greatest threat to survival of recently hatched grouse chicks. Grouse chicks can withstand most weather impacts when they are very young; their survival is enhanced with nutrition from the yolk sac (about 5-7 days) and the entire clutch can be effectively “brooded” by the hen. However, when the chick’s brood sac is exhausted and as they get bigger fewer chicks can fit underneath the outstretched wings of the brooding hen. So young birds must be physically fit to survive inclement weather on their own or they could be lost to exposure. An exceptional year or “hatch” takes place when all of these factors align, good foods (primarily acorns), a mild winter, and mild weather during the first 2-4 weeks of life for the grouse chicks.

2014-15 Age and Sex Ratios. Tail and wing feathers ($n = 102$) donated by hunters were used to determine the age and gender of the birds cooperators harvested. Males comprised a majority of the birds submitted (56%) and adult birds were more common (52%) than juveniles (48%). In expanding populations, juvenile animals typically compose a majority of the age distribution. In this survey, the long-term average (42 years) of juveniles harvested during the season is 41%. Juvenile recruitment rates in excess of 41% could be viewed as a good recruitment year although in most wildlife populations juveniles should out-number adults (>50%) in a good recruitment year. The long-term decline in grouse populations in the Appalachians may be related to these low recruitment rates. However, recruitment is only one of a host of variables that may be impacting long-term grouse declines in the Appalachians.

Fall 2014-15 Population Indices and Hunting

2014-15 Grouse Hunter Survey. Fifty-seven grouse hunters cooperated in the Fall Grouse Hunter Survey. This is a significant increase in participation over last year where only 23 grouse hunters participated. Cooperators reported flushing 0.65 birds per hour in the 2014-15 season. When examined over the past 10-years, it appears the average annual flushing rate is showing a declining trend, however, the trend is not statistically significant (Fig. 3). The statistical conclusion is that the population has been stable over the past 10 years. With the exception of the 2010 season, the flushing rate in 2014-15 was lower than any of the past 10 years. The long-term survey average is 1.1 birds per hour. We asked cooperators to rank each hunt from a score of 1 to 7 with 7 being the highest, 4 was average, and 1 was low. A score of three (3) was the most frequent score cooperators rated hunts, meaning those hunts were below the “mid-point” of the rankings. The average ranking for the 2014-15 season was 3.2. It is not surprising that hunters rated hunts higher if they flushed more birds; we confirmed this relationship in Figure 4. Grouse flushing averages for other Appalachian states appear to show the similar long-term and recent trends (Fig.5).

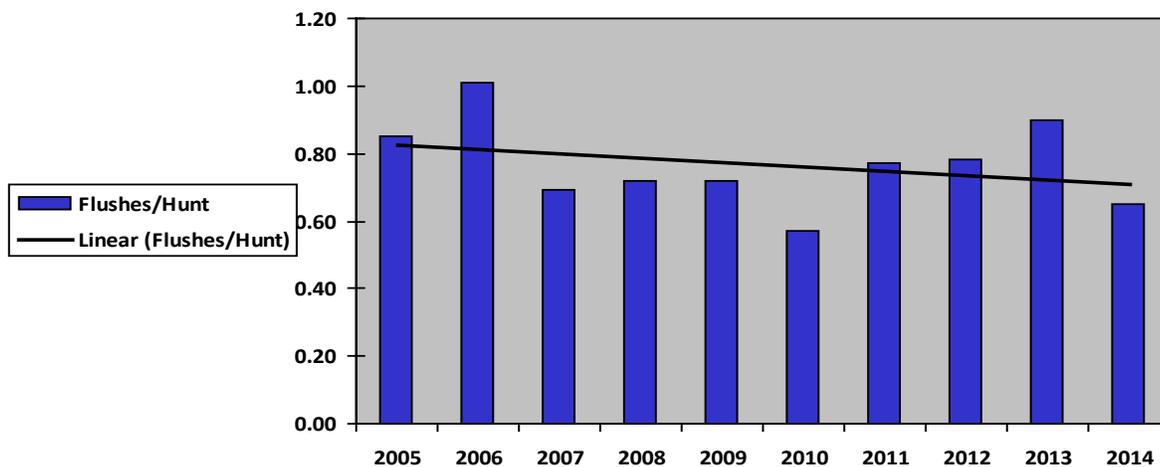


Figure 3. Ruffed grouse flushing rates as reported by cooperating avid grouse hunters in Virginia between over the past 10 years.



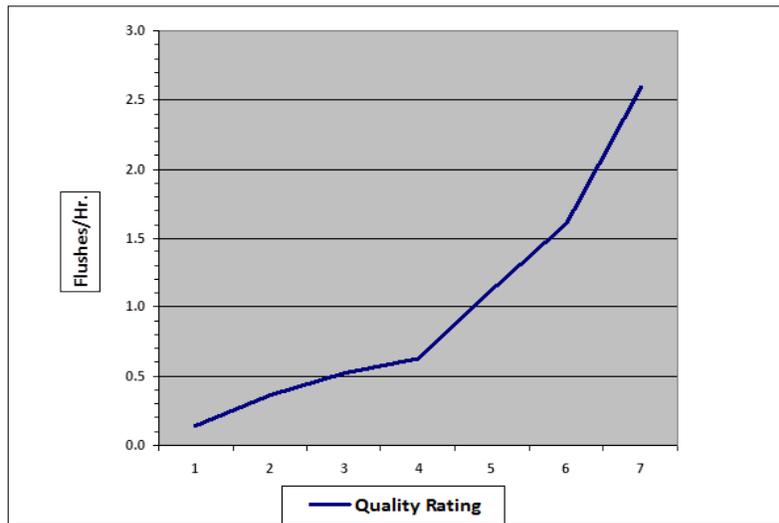


Figure 4. Relationship between the numbers of grouse flushed and grouse hunter cooperator rating in 2014-15. A score of 1 was the lowest rating and 7 was the highest.

Table 1. Harvest, effort, and satisfaction summary of cooperating ruffed grouse hunters in Virginia.

Year	Coop. (n)	Hunts (n)	Hunts/ Season	Hours/ Hunt	Grouse/ Season	Kill/ Hour	Flush/ Hour	Hunt Qty. ¹
1990-91	110	1,241	11.3	4.1	5.5	0.12	1.03	
1991-92	93	1,204	12.9	4.0	5.2	0.10	0.98	
1992-93	81	1,106	13.7	4.0	6.1	0.11	1.01	
1993-94	61	668	11.0	3.6	3.6	0.09	1.10	
1994-95	84	1,040	12.4	3.9	5.3	0.11	0.97	
1995-96	70	780	11.1	3.7	4.8	0.12	1.50	3.2
1996-97	114	1,269	11.1	3.9	5.4	0.13	1.26	3.2
1997-98	87	1,098	12.6	3.7	5.8	0.12	1.33	3.6
1998-99	69	963	13.9	3.3	5.5	0.12	1.11	3.4
1999-00	93	1,013	10.9	3.7	4.5	0.11	1.01	2.8
2000-01	62	904	14.5	3.7	7.9	0.15	1.45	3.6
2001-02	80	1,082	13.5	3.7	8.9	0.18	1.61	4.0
2002-03	64	851	13.3	3.6	6.1	0.13	1.11	3.2
2003-04	60	779	13.0	3.5	4.5	0.10	0.92	2.7
2004-05	94	1,275	13.6	3.3	4.8	0.11	1.03	3.1
2005-06	63	888	13.8	3.3	4.5	0.10	0.85	3.0
2006-07	54	830	15.4	3.4	5.9	0.11	1.01	3.0
2007-08	75	887	11.8	3.5	2.7	0.07	0.69	2.9
2008-09	53	748	14.1	3.4	2.8	0.06	0.72	2.8
2009-10	58	418	7.2	3.2	1.5	0.06	0.72	3.0
2010-11	43	454	10.6	3.2	1.7	0.05	0.57	2.6
2011-12	53	634	12.0	3.4	3.3	0.08	0.77	3.3
2012-13	44	472	9.7	3.3	2.5	0.08	0.78	3.5
2013-14	23	209	9.1	3.1	1.0	0.06	0.90	3.7
2014-15	57	569	10.0	3.4	1.5	0.06	0.65	3.1

Hunt Qty.¹ = Hunting quality based on a scale of 1 (poor) to 7 (excellent).

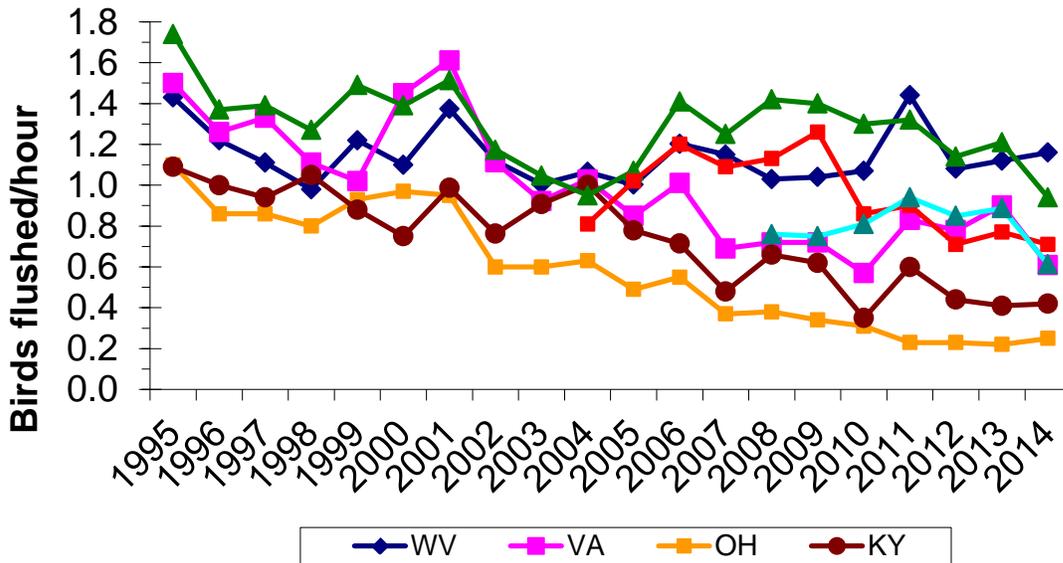


Figure 5. Southern Appalachian ruffed grouse flushing rates (flush/hr.).

2014-15 Bow Hunter Survey. Archers ($n = 130$) cooperating in the Department’s 2014 Bow Hunter Survey saw 0.9 grouse per 100 hours of deer hunting in counties west of the Blue Ridge Mountains (WBR). In the previous year (2013), WBR bow hunters saw 1.0 grouse per 100 hours of hunting. The Bow Hunter Survey shows a steady decline in the number of grouse archers have seen until 2010 (Fig.6). Since then grouse numbers appear to have stabilized at lower densities.

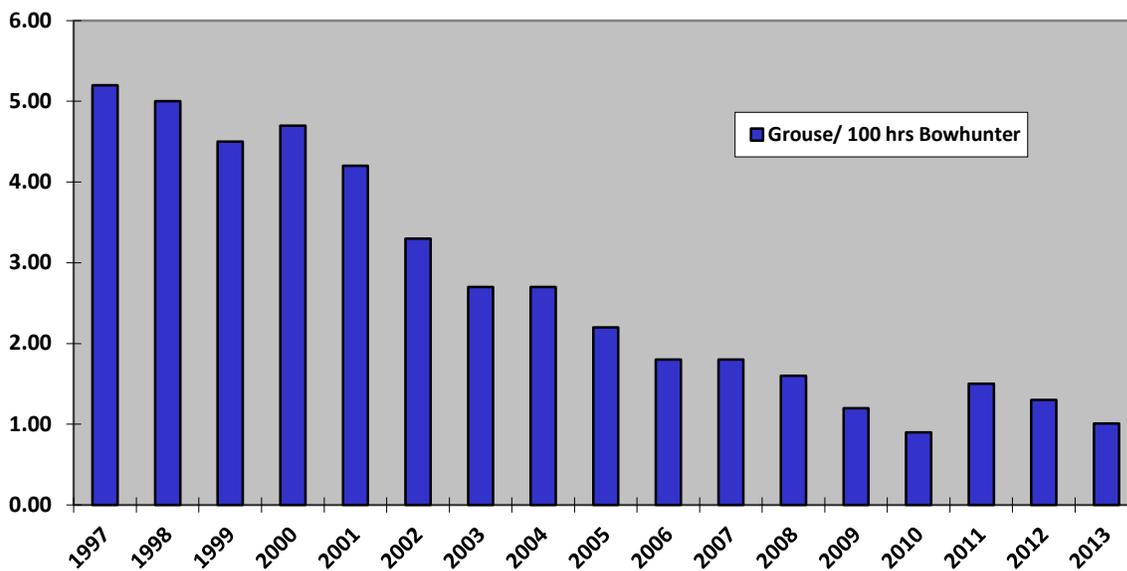


Figure 6. Grouse seen per 100 hours of hunting by archers during the early deer archery season.

Short and Long-Term Trends

Long-Term Trends. All of the grouse population survey results suggest long-term declines that are statistically significant (Table 2). Grouse observations by archers in our Bow Hunter Survey in October suggest the steepest decline, 7.3% over the past 13 years. The other surveys suggest long-term declines ranging between 0.6 and 3.2 annually. These are statistically significant declines. The Roadside Drummer Survey is perhaps our best index as the survey technique is widely accepted and used in grouse range. This survey suggests our grouse population has declined nearly 3% annually over the past 21 years. It is interesting that this survey suggests a much lower rate of decline (-0.6) over the past 15 years (Table 2).

Short-Term Trends. All of our surveys, except the Bow Hunter Survey, suggest grouse populations have been stable or fluctuating over the past 10 years. Archers have reported grouse numbers declining 5.8% annually over the past 10 years. The rate of decline in the Bow Hunter Survey is statistically significant. This statistic is most concerning; however, we must point out that no studies have ever validated the use of archer's observations as a valid grouse survey method. The number of drumming grouse heard from our spring surveys actually shows a positive trend, but the trend is not statistically significant. This unreliability or unpredictability indicates a stable population in recent years.

Table 2. Short and long-term trends of ruffed grouse populations based on fall and spring surveys.

Time Frame	Survey	Years	Trend	Stat. Significant ¹
Long-Term	Grouse Hunter Flushing Rates	15	-3.2%	Yes – Declining
	Bow Hunter Counts	13	-7.3%	Yes – Declining
	Spring Gobbler Survey	15	-2.2%	Yes – Declining
	Spring Roadside Drumming	15	-0.6%	Yes – Declining
Short-Term	Grouse Hunter Flushing Rates	10	-0.7	No – Stable
	Bow Hunter Counts	10	-5.8	Yes – Declining
	Spring Gobbler Survey	10	0.1	No - Stable
	Spring Roadside Drumming	10	0.5	No – Stable

Stat. Significant¹ = Statistical significance indicates if the observed trend closely fits the trend line of the variable over time. If the trend line is near zero or if the years vary widely and have no pattern, then it is assumed to be stable.

What To Expect This Fall...

2015 Spring Roadside Drumming Survey. Drumming rates dropped sharply in 2015 (0.07) when compared to 2013 (0.11) and 2014 (0.12 drums per route). Despite these low numbers, I have received many more grouse and woodcock sightings and flushes than normal thus far in 2015.

Obviously weather and predators affect the survival or recruitment rates of young birds into the population. We had extended periods of rain during the critical times for grouse broods but thankfully temperatures were moderate. We would have expected poor recruitment if the temperatures had been colder. The rain has resulted in excellent amounts of herbaceous material (food and cover), insects (primary grouse chick food), and berries.

The Future.

Department surveys estimate the number of grouse hunters has declined from 34,156 hunters in the 1994-95 season to 6,677 hunters in the 2011-12 season. Only 3.5% of hunting license buyers hunted grouse and 5.1% hunted quail. Clearly interest in upland game bird hunting has declined to low levels. Despite these discouraging numbers it is very encouraging to read cooperator comments about their continued effort despite lower grouse populations.

The primary cause of the grouse population decline is believed to be the loss of habitat, specifically young forests. Young forests provide food and cover for grouse throughout the year. Yes, acorns are a critical food resource, but without nearby cover to escape predators, grouse populations are challenged to survive and reproduce. We recognize we have more coyotes and bears now than we had 10 years ago; our predator communities have clearly changed. You might not think bears would be a threat to grouse, but we have captured bears on film predating grouse nests. While 4-legged critters pose a threat to nesting grouse, most of the predation on grouse comes from avian predators. The peak of grouse predation takes place when smaller woodland hawks are migrating in the fall and spring months.

Concerted conservation measures are needed to simply maintain grouse populations at current low levels. Restoration of grouse populations to 2001-02 levels will require significant efforts to sustain and create more early succession habitats. Despite the challenge, creating good grouse habitat is not difficult; however, it takes interest, effort, and commitment. Grouse are not the only wildlife species in peril that are facing the same management challenge. Natural resource agencies like the Department and the US Forest Service will be challenged to meet these needs and your support of wildlife conservation on public lands will help. Non-governmental agencies like the Ruffed Grouse Society are also vital to grouse conservation. Their mission statement is to “enhance through ecologically sound wildlife management practices, the environment for ruffed grouse, American woodcock, and other forest wildlife that utilize or require thick, young forests.” If you are interested in improving your property for grouse and other wildlife needing young forests please contact the Department, we have District Biologists than can help you meet your goals for wildlife on your lands. Find your District Biologist on our web site at: <http://www.dgif.virginia.gov/quail/staffcontact.asp>.

Grouse Book. Following 6 years of intensive research on the ecology and management of Appalachian Ruffed Grouse, project researchers published a book summarizing the major findings of their work in an easy to read format that should provide hunters and managers with a wealth of new information on grouse. The title of the book is *Ecology and Management of Appalachian Ruffed Grouse*. Copies are available through common internet book sales.

Last Shot. Unfortunately, we do not have much information about recruitment of young birds into the population at this time. The reports we have received are very encouraging, for a change. I pass this along with caution because population change may not be evenly widespread. Acorn crops are below average and scattered throughout the landscape in 2015. Beech crops appear above average as do most soft mast crops, so grouse should be good in thick covers with most any type of soft mast. Best of luck this fall with your grouse hunting!!