

Performance Report

State: New Hampshire

Grant W-89-R-6

Grant Type: Survey and Inventory

Period Covered July 1, 2005– June 30, 2006

Project Title: SMALL GAME RESEARCH AND MANAGEMENT

Project VII

Job 1: Harvest Mortality Data Collection, Entry and Analysis

Job Objective: To annually collect the sex and age of hunter harvested grouse in order to develop an annual grouse productivity index.

Summary: A pilot study was initiated this year in Pittsburg, NH. Small Game hunters were asked to participate in a ruffed grouse wing and tail study in the northern portion of the state. The Ruffed Grouse Society (RGS) helped coordinate the project and provided a Charles-Daley shotgun to be given to one of the participants through a drawing.

Target Date: June 30, annually

Status of Progress: On schedule

Deviations: None

Total Cost:

Procedures: Cooperating hunters identified by the Small Game Project Leader, will be provided detailed information regarding the aging and sexing of ruffed grouse. Grouse hunting diary cards will be provided to cooperators. Information regarding the age, sex, town of kill, date of kill, number of grouse collected, and principal content of grouse crops will be recorded on the diary cards. Completed diary cards will be returned to the small game project upon completion of the annual ruffed grouse season on December 31. Data from cards will be analyzed and a brief summary report will be returned to cooperators. The number of juveniles harvested per adult female per year, will serve as an index to annual grouse recruitment into the fall population. In the event that diary cards provide fewer than 100 grouse samples, matched tail and wing samples may be collected at Fish and Game Regional offices from cooperating members of the New Hampshire Chapter of The Ruffed Grouse Society and others, for analysis and summarization by our Small Game Project biologist.

Results: Ruffed grouse wing and tail survey packets were assembled and placed at advertised locations, including the Region 1 Fish and Game Department Office. Hunters were solicited to participate through a small game survey mailing and through posters placed at participating locations. Completed survey envelopes containing a wing and tail from a harvested ruffed grouse and a completed survey card (Appendix 1) were returned to a participating location for pick-up. Samples were then relayed to the Small Game Biologist at the Region 3 Office in Durham and were stored in a freezer until they were analyzed by interested biologists and hunters.

The raw data from this survey can be found in Appendix 2. Aging and sexing of grouse samples was accomplished using widely accepted methods described by Destefano, et al. in a popular publication entitled: "Tips for Examining, Aging and Sexing Ruffed Grouse". Of 62 samples received, on 56 were usable (sex and age could be determined). Of the 56 usable samples, 37 (66%) were males and 19 (34%) were females. Only 9 (16%) usable samples were juveniles. This

represents a modest 0.47 juvenile birds per adult female. This low number of juveniles likely results from poor recruitment of young birds stemming from prolonged rain and cold temperatures that occurred during hatch weather in the preceding spring (2005). Wing/tail data in the future will become more valuable as hunter participation increases and as data from multiple sample years are accumulated.

Conclusions: This job provides us with the means to efficiently generate useful productivity data. Equally important, the project generates significant public interest, and simultaneously builds knowledge, enthusiasm and active participation in ruffed grouse management efforts in New Hampshire.

Recommendations: Continue this job as planned. In addition, focus on expanding the scope and scale of this study, to cover a larger geographic area, and to increase public participation and sample size.

Submitted by

Julie Robinson
Small Game Project Leader
July 1, 2006

Appendix 1. 2005/06 Ruffed Grouse Wing and Tail Survey Card and Instructions.



**New Hampshire Fish and Game
Ruffed Grouse Wing & Tail Survey**

Name: _____
Address: _____
City: _____ State: _____ Zip Code: _____
Phone #: _____ E-mail: _____
Town where bird was harvested: _____
How many hours did you hunt: _____
Date bird was harvested: _____
Did you hunt with a dog: Y N
Did you see any woodcock? Y N
Comments:

Any questions call Julie Robinson, Small Game Project leader, NH Fish and Game Region 3 Office 868-1095

Instructions for Removing Wing and Tail

Hunters are asked to help in data collection by providing a wing and tail fan with rump feathers from harvested ruffed grouse. This information is used for determination sex and age composition and general health of local populations. Remove one complete wing from your harvested bird and the whole tail **including the rump feathers**. Please allow the parts to dry for a few days before placing them in the envelope. Complete the enclosed survey and place both the survey and the wing and tail in the manila envelope and seal. **Only one tail and wing per each envelope, please.** Drop off the packet and one of the following participating stores:

- Young's Store---Pittsburg, NH
- Emerson's Outdoor Outfitters---Groveton, NH
- LL Cote's Store---Errol, NH

All packets must be turned in no later than January 1, 2006 to be included in the raffle for the shotgun donated by The Ruffed Grouse Society. Any Questions please call Julie Robinson, Small Game Project Leader for New Hampshire Fish and Game 603-868-1095. Thank you for participating and have a safe hunting season!

Appendix 2. Ruffed Grouse Wing and Tail Survey Raw Data.

Harvest Town	Age	Sex
Pittsburg		not usable
Pittsburgh	Adult	not usable
Pittsburgh	Juvenile	not usable
Pittsburgh	Adult	not usable
Pittsburgh		not usable
Pittsburgh	Adult	not usable
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Juvenile	Female
Pittsburgh	Juvenile	Female
Pittsburgh	Adult	Female
Pittsburgh	Juvenile	Female
Pittsburgh	Juvenile	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Cambridge	Adult	Female
Pittsburgh	Juvenile	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Female
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Lancaster	Adult	Male
Clarksville	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Juvenile	Male
Pittsburgh	Juvenile	Male
Colebrook	Adult	Male
Richmond	Adult	Male
Pittsburgh	Adult	Male
Colebrook	Adult	Male
Cambridge	Adult	Male
Pittsburgh	Adult	Male

Harvest Town	Age	Sex
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Stratford	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Juvenile	Male
Stratford	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburg	Juvenile	Male
Pittsburg	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male
Pittsburgh	Adult	Male

Performance Report

State: New Hampshire

Grant W-89-R-6

Grant Type: Survey and Inventory

Period Covered July 1, 2005 – June 30, 2006

Grant Project: SMALL GAME RESEARCH AND MANAGEMENT

Project VII

Job 2: Non-Harvest Data Collection, Entry and Analysis

Job Objective: To quantify New Hampshire small game hunter interests, activities, preferences and attributes, and to use small game observations and archery deer hunter observations as an index of New Hampshire small game species distribution and abundance. To produce an annual density index of ruffed grouse and American woodcock, to be used in season setting, public education, and recreational promotion.

Summary: Two small game surveys were created and implemented in 2005. Small game sighting data were solicited from small game hunters and successful deer bow hunters. All data were entered into electronic data sets and analyzed. A total of 32 ruffed grouse drumming routes and 22 woodcock singing routes were run during the spring of 2006. Of 22 woodcock routes run in NH during 2006, 9 were run as a supplement to routes run annually on behalf of the U.S. Fish and Wildlife Service.

Target Date: June 30, annually

Status of Progress: On schedule

Deviations: None

Total Cost:

Procedures: Volunteer small game hunter survey participants are solicited through assorted outreach efforts including news releases, magazine and newspaper articles, speaking engagements, and targeted mailings. An effort is made to identify as many as 400 New Hampshire small game hunting cooperators (100 per region) through various means and outreach efforts. Volunteers are provided small game survey cards that serve to quantify regional hunting efforts and sighting rates. Information regarding hunting preferences, and recreational and economic values may be collected and/or projected. Returned survey data are electronically stored and analyzed on an annual basis. Volunteers receive an annual project summary report (see Job 4) as a reward for past survey participation and as an incentive for future cooperation. Successful archery deer hunters from the previous year are provided with a copy of an archery survey that solicits observation data regarding select small game (and other) species.

Standard ruffed grouse drumming route and woodcock singing route methodologies will be employed. Staff will conduct approximately 20 grouse routes and 8 woodcock routes annually. Routes will be randomly stratified across 5 management regions. All data will be electronically stored and analyzed on an annual basis. Woodcock route data will be merged with 10 existing woodcock routes run for the Fish and Wildlife Service, in order to strengthen regional sample sizes.

Results: Small Game Hunter Surveys: A small game hunter survey and associated letter (Appendix 1) was designed, printed, and provided to volunteer participants. Survey participants were solicited through speaking engagements, newspaper articles, news releases, and at public hearings and moose hunter seminars. All survey data were entered and summarized electronically with SAS or Access software. Small game hunters submitted 267 completed small game surveys. Although this response is 33% below the previous segment's record 400 surveys, it is nearly 3-fold the average number of surveys returned during the preceding 5 years. Increased participation in the survey over the past 2 years appears to stem from our use of a firearm as an award incentive to bolster participation rates. Small game survey data for the 2005/2006 are summarized in Appendix 3, which lists raw data generated through the survey, by assorted tables (1-13). Nearly 70 percent of small game hunting occurred during the month of October (Table 1). Ruffed grouse were the most sought after small game species in NH, accounting for 61% of hunting hours, while woodcock accounted for 20% of hunter effort (Table 2). The North Region (see map, Appendix 4) was the most popular hunting region in New Hampshire accounting for 38% of reported hunting hours, followed by the Central Region (28%) (Table 3). Ruffed grouse hunting in the North region accounted for the most small game hunter hours (Table 4). The majority of survey respondents hunted over dogs, although there were a larger percentage of hunters that hunted grouse without a dog (Table 5). Woodcock were seen at a rate of 1.16 birds per hunter hour (Table 6). Dog hunters enjoyed a slightly higher success rate than non-dog users (Table 7). Grouse observation rates were highest in the North region followed by the White Mountains and Central regions (Table 8) and woodcock observation rates were highest in the Northern region (Table 9). A graphic representation and detailed interpretation of small game survey data can be seen in W-89-R-6, Project VII, Job 4, Appendix 1, Figures 1-9.

Bow Hunter Survey: Bow hunter surveys (Appendix 2) were designed, printed, and sent to all successful 2004 deer bow hunters (N=1,915). Of these, only 173 bow hunters (9%) completed and returned a survey. This poor response rate may reflect the late mailing of surveys, stemming from printing delays. For a listing of bow hunter grouse observation data, see Appendix 3, Table 10. Bow hunter grouse observations are thought to reflect good production in the North and White Mts. regions and stable to declining populations in southern regions during 2005. The greatest increase in the observation rate between 2004 and 2005 was seen in the Southwest region. A graphic representation and detailed interpretation of bow hunter grouse observations can be seen in W-89-R-6, Project VII, Job 4, Appendix 1, Figure 10.

Grouse and Woodcock Survey Routes: Ruffed grouse drumming routes were established in 1999. These routes were randomly placed in each of 18 wildlife management units (WMU's), at a rate of 2 routes per WMU. On average, each WMU consists of 500 square miles. WMU's were delineated on topographic maps printed in the "New Hampshire Atlas and Gazetteer". These maps were broken into a grid system consisting of 4-square mile blocks. X and Y coordinates were randomly selected in order to randomly select 2 four-square mile blocks in each WMU. Ten-mile grouse drumming routes were then subjectively mapped on roads that either began in, or passed through the randomly selected blocks. Roads with high volumes of traffic and/or high-speed traffic were avoided. Habitat quality was ignored as a consideration in route placement. Ruffed grouse survey methodologies are described on the attached ruffed grouse survey form (Appendix 5). Woodcock surveys were conducted using existing U.S. Fish and Wildlife Service methodologies. Non-federal woodcock routes were run in those WMU's not covered by our existing U.S. Fish and Wildlife Service woodcock survey route program. Non-federal routes were run on segments of the randomly established ruffed grouse drumming routes.

Thirty-two grouse routes were run in 2006 (Appendix 6). Survey route data are summarized on the basis of 5 small game management zones (see map, Appendix 4). Grouse route survey data are summarized in Appendix 3, Tables 11-12. Grouse were most abundant in the North and White Mountain Regions of New Hampshire, where an average 0.45 and 0.44 drumming events per stop respectively, were heard. This was a decrease from 0.85 drumming events per stop in the White Mountains and 0.68 in the North, in 2005. The 2006 North Country route index showed a decline from .73 drumming events per stop in 2005 to 0.48 events per stop in 2006 (Appendix 3, Table 12). Poor weather post-hatch in 2005, may be responsible for this reduction. See W-89-R-6, Project VII, Job 4, Appendix 1, Figures 11 and 12, for further details on 2006 grouse route results.

Woodcock density patterns varied throughout the state. Survey results for 2006 (Appendix 7) showed increases in woodcock heard per stop in the Central, Southwest and Southeast regions but fewer birds heard in the North and White Mountain regions (see Appendix 3, Table 13, and W-89-R-6, Project VII, Job 4, Appendix 1, Figures 13). The Southeast and Southwest regions both showed marked increases in singing males per stop. These increases may be partially attributable to excellent weather conditions during the survey period. Decreases were observed in our North and White Mountain regions. New Hampshire woodcock densities remain relatively strong and stable, as compared to data from the Eastern U.S. region at large (see Project VII, Job 4, Appendix 1, Figure 14).

Conclusions: Small Game and Bow Hunter surveys allow the Fish and Game Department to quantify hunter activity and observations, to generate inexpensive indices for key small game species, and to engage important constituents in direct

and routine communications. Grouse and woodcock surveys provide us with an efficient on-the-ground means to generate useful management data that is of significant public interest. With accumulating years of survey and route data, we are gaining substantial insight into the dynamics and relative abundance of these important small game species. Over time, survey results will provide invaluable trend data for management decision-making.

Recommendations: Our use of assorted surveys to monitor small game hunters and small game populations have proven to be an efficient and cost-effective method for monitoring small game hunter activity and small game populations. As a consequence, no changes in this job are recommended.

Submitted by

Julie Robinson
Small Game Project Leader
July 1, 2006

Appendix 1. 2005/2006 small game hunter survey card and accompanying 2005 letter.

2005/2006 SMALL GAME HUNTER SURVEY

Return by December 31, 2005 for Fall Hunting or March 31, 2006 for Winter Hunting



NAME: _____

MAILING ADDRESS: _____

TOWN OF RESIDENCE:

STATE:

ZIP: _____

DID YOU DO MOST OF YOUR SMALL GAME HUNTING WITH A DOG? YES NO

MONTH	DAY	WMU	TOWN HUNTED	# HOURS HUNTED	# WOODCOCK SEEN	# GROUSE SEEN	# GRAY SQUIRREL SEEN	# RABBIT SEEN	# HARE SEEN	SPECIES PRINCIPALLY HUNTING FOR *
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*USE UNDERLINED 2 LETTERS OF SPECIES YOU WERE PRINCIPALLY HUNTING FOR.
 WQ=Woodcock, GB=Grouse, SQ=Gray Squirrel, BA=Cottontail Rabbit, HA=Snowshoe Hare

Dear Small Game Hunting Enthusiast:

Thank you for participating in our small game hunter survey. Your field observations will provide our small game project with valuable management insight into American woodcock, ruffed grouse (partridge), gray squirrel, cottontail rabbit and snowshoe hare. The data you collect will help us to: 1) determine small game distribution in New Hampshire; 2) compare small game abundance by region; 3) assess annual changes in abundance stemming from changes in productivity and mortality; 4) generate small game hunting season forecasts; 5) determine management needs, and; 6) identify areas for possible habitat management.

When filling out this survey, PLEASE ADHERE TO THE FOLLOWING GUIDELINES:

- *Only record YOUR 2005/06 **small game hunting observations**;*
- *The small game season can be divided into **2 reporting periods**: September 1 – December 31, and January 1 through March 31. If you hunt during both reporting periods, please advise us of such and we will send you a second survey;*
- *Enter your daily hunting observations sequentially. Your survey accommodates **14 days** of hunting information. Feel free to submit **copies** of the survey if you would like to do so;*
- *Please **return your postage-paid survey** upon filling in all available days, and/or by the last day of the appropriate reporting period (either December 31 or March 31).*
- *If you don't see any small game when hunting, zero fill the appropriate columns for that day;*
- *Include the Wildlife Management Unit (WMU) (see map on reverse side of this letter) and the town in which you hunted. Please don't list village names. We **will not** publish town results;*
- *Note that the last column on the survey is intended to identify the game species you were **"PRINCIPALLY" HUNTING FOR**. If your principal pursuit was woodcock, place "WO" in the blocks, if it was gray squirrel place "SQ" in the blocks, etc. Note that the 2- letter abbreviation for each species of interest is highlighted on the survey form. **Your data is only useful to us if you fill in the "PRINCIPALLY HUNTING FOR" column**;*
- ***Only fill out the survey if you are hunting the small game species we have listed**;*
- *If you have a friend who would like to participate in this survey, have them call **271-2461**;*
- *A brief summary report will be distributed to all survey respondents upon its completion.*

If you have questions about this survey, please feel free to call me at 868-1095. If you know someone who would like to participate in this survey, please send them our way; we need additional participants. Thanks in advance for your cooperation. **Our success depends on your response!**

Respectfully,

Julie Robinson
Wildlife Biologist

Appendix 2. 2005 bow hunter survey card and accompanying 2005 letter.

2005 BOW HUNTER SURVEY - RETURN BY NOV. 5, 2005



NAME: _____

MAILING ADDRESS: _____

TOWN OF RESIDENCE:

STATE:

ZIP: _____

MONTH	DAY	WMU	TOWN HUNTED	# HOURS HUNTED	# GROUSE SEEN	# TURKEY SEEN	# GRAY SQUIRREL SEEN	# FISHER SEEN	# BEAR SEEN	# BOBCAT SEEN
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Dear Successful Bow Hunter:

The enclosed ***BOW HUNTER SURVEY*** provides our wildlife managers with valuable insight into the relative abundance and distribution of a number of important wildlife species. This year's survey is being sent to Granite State bow hunters who successfully harvested a deer during the 2005 archery season. We've chosen to work with successful bow hunters because: **1)** bow hunters are active during ideal wildlife viewing times, **2)** bow hunters employ hunting techniques that facilitate high wildlife observation rates, and; **3)** bow hunters have a good track record of responding to past surveys.

This survey provides you with an opportunity to contribute to our successful wildlife management programs. Your completed surveys provide valuable information to our small game, turkey, furbearer and black bear projects. Survey data enhances our knowledge and understanding of this spectacular array of wildlife species. Your observations are key to our success. **Please take the time to respond.** A brief summary report will be distributed to all survey respondents upon completion.

When filling out the survey card, **PLEASE ADHERE TO THE FOLLOWING GUIDELINES:**

- *Only record **your** 2005 September/October bow hunting observations;*
- *Include all days that you actually bow hunt until the survey is filled;*
- *On those days when you don't see the listed species, fill in the appropriate columns with zeros;*
- *Include the Wildlife Management Unit (WMU) (**see the map on reverse side of this letter**) and the town in which you hunted. Please don't list village names;*
- *Your survey card accommodates up to 15 days of hunting information. Feel free to submit additional copies of the survey card if you are so inclined;*
- *Please send your **postage paid** survey card back to us by **November 5th**. Cards postmarked after December 1st will not be included in our data summary;*

If you have any questions about this survey, please feel free to call me at 868-1095. Thanks in advance for your cooperation. **Our success depends on your response!**

Respectfully,

Julie Robinson
Wildlife Biologist

Appendix 3. Survey data (Tables 1-13) used to generate summary report figures (Figures 1-13) in the Annual Small Game Summary Report.

Table 1. New Hampshire small game hunter survey hours expended per day during the 2005 small game season.

DATE	HOURS	DATE	HOURS	DATE	HOURS	DATE	HOURS
01-Sep-05	5	06-Nov-05	28	27-Dec-05	20.5	25-Feb-06	24
03-Sep-05	10	07-Nov-05	20	28-Dec-05	8	26-Feb-06	17
04-Sep-05	2	08-Nov-05	21	29-Dec-05	5	27-Feb-06	2
05-Sep-05	7	09-Nov-05	14	30-Dec-05	16	28-Feb-06	2
06-Sep-05	3	10-Nov-05	28	31-Dec-05	32.5	02-Mar-06	4
08-Sep-05	2	11-Nov-05	37.5	01-Jan-06	10.5	04-Mar-06	3
10-Sep-05	2	12-Nov-05	56.5	02-Jan-06	14	05-Mar-06	8
11-Sep-05	12	13-Nov-05	44	05-Jan-06	3	06-Mar-06	2.5
12-Sep-05	3	14-Nov-05	18	07-Jan-06	23	11-Mar-06	20
17-Sep-05	4	15-Nov-05	6	08-Jan-06	20.5	12-Mar-06	2
24-Sep-05	8	16-Nov-05	7	09-Jan-06	1.5	14-Mar-06	3
25-Sep-05	2	17-Nov-05	16.5	10-Jan-06	2	16-Mar-06	3
28-Sep-05	2	18-Nov-05	19	11-Jan-06	5	17-Mar-06	2.5
01-Oct-05	455	19-Nov-05	51	12-Jan-06	6	18-Mar-06	7.25
02-Oct-05	339.5	20-Nov-05	52.5	13-Jan-06	8	19-Mar-06	8.5
03-Oct-05	111	21-Nov-05	22	14-Jan-06	20	24-Mar-06	12
04-Oct-05	91	22-Nov-05	2	15-Jan-06	15	25-Mar-06	14
05-Oct-05	91.5	23-Nov-05	13.5	19-Jan-06	1.75	26-Mar-06	8
06-Oct-05	113	24-Nov-05	12	20-Jan-06	10	27-Mar-06	7
07-Oct-05	151.5	25-Nov-05	12.5	21-Jan-06	23	28-Mar-06	9
08-Oct-05	179	26-Nov-05	38	22-Jan-06	20	29-Mar-06	3.5
09-Oct-05	219	27-Nov-05	40	23-Jan-06	3.5	30-Mar-06	6
10-Oct-05	141.5	28-Nov-05	18	24-Jan-06	3	31-Mar-06	2.25
11-Oct-05	116	29-Nov-05	1	25-Jan-06	14	TOTAL	6113.5
12-Oct-05	126	30-Nov-05	14	26-Jan-06	2		
13-Oct-05	125	01-Dec-05	5.5	28-Jan-06	27.5		
14-Oct-05	149	02-Dec-05	16.5	29-Jan-06	19		
15-Oct-05	150	03-Dec-05	34.5	01-Feb-06	6.5		
16-Oct-05	178	04-Dec-05	24.5	02-Feb-06	2		
17-Oct-05	83	05-Dec-05	7	03-Feb-06	7		
18-Oct-05	111.5	06-Dec-05	4	04-Feb-06	29		
19-Oct-05	93	07-Dec-05	10	05-Feb-06	11		
20-Oct-05	142	08-Dec-05	6	07-Feb-06	0.5		
21-Oct-05	107	09-Dec-05	4	08-Feb-06	5		
22-Oct-05	210.5	10-Dec-05	32	10-Feb-06	3		
23-Oct-05	145	11-Dec-05	39	11-Feb-06	16		
24-Oct-05	74	12-Dec-05	4	12-Feb-06	8		
25-Oct-05	18	13-Dec-05	6	13-Feb-06	4.5		
26-Oct-05	38.5	15-Dec-05	7	14-Feb-06	7.5		
27-Oct-05	72.5	16-Dec-05	1	15-Feb-06	4.5		
28-Oct-05	101.5	17-Dec-05	11	16-Feb-06	1		
29-Oct-05	147	18-Dec-05	26.5	17-Feb-06	1		
30-Oct-05	172.5	19-Dec-05	10	18-Feb-06	21		
31-Oct-05	56	21-Dec-05	1	19-Feb-06	9		
01-Nov-05	29	22-Dec-05	18.5	20-Feb-06	5		
02-Nov-05	21	23-Dec-05	18.5	21-Feb-06	3.5		
03-Nov-05	39.5	24-Dec-05	19	22-Feb-06	1.5		
04-Nov-05	18	25-Dec-05	3	23-Feb-06	3.25		
05-Nov-05	65	26-Dec-05	12	24-Feb-06	4		

Table 2. New Hampshire small game hunter effort per species (1999-2005)*.

Hunting_for	Hours Hunted Per Species Per Year*						
	1999	2000	2001	2002	2003	2004	2005
GROUSE	1795.5	1573.8	2296.25	1905	1797.45	7661.25	3760
HARE	521	254	512.5	499.5	754	417.5	714
RABBIT	101	55.5	48	16	83.5	51	146
SQUIRREL	78.5	11	40.5	90	49	751	241
WOODCOCK	288	506.5	368	555.8	544.2	2019.25	1254.5

In Tables 1-13, the year denotes the year that the fall season began. Note that small game seasons run September-March, depending on the species.

Table 3. New Hampshire small game hunter effort by region (1999-2005).

	Hours Hunted Per Region Per Year						
	1999	2000	2001	2002	2003	2004	2005
NORTH	1100	862.3	1621.75	1465.5	1607.4	4091.5	2350.5
WHITE MTNS	386	429.5	311.5	439.3	389	1003.25	732.5
CENTRAL	586	643.25	674	692.5	799.75	3026.25	1810.5
SOUTHWEST	386	260.25	425.5	313.5	277.5	1725.75	775.5
SOUTHEAST	326	205.5	232.5	155.5	154.5	1053.25	446.5

Table 4. New Hampshire small game hunter effort by species by days by region during the 2005 season.

REGION	Hours Hunted Per Region Per Species				
	GROUSE	HARE	RABBIT	SQUIRREL	WOODCOCK
NORTH	1846.5	328	0	0	176
WHITE MTNS	342.5	121	0	0	269
CENTRAL	975	201	73	108	453.5
SOUTHWEST	464.5	13	15.5	33	249.5
SOUTHEAST	131.5	51	57.5	100	106.5

Table 5. New Hampshire small game hunter effort with and without the aid of a dog during the 2005 season.

	Hours Hunted				
	GROUSE	HARE	RABBIT	SQUIRREL	WOODCOCK
WITH A DOG	1517.5	575.5	23.5	44	917
WITHOUT A DOG	1849	94.5	122.5	179	102

Table 6. New Hampshire small game hunter reported activity and observations (1999-2005).

1999	Hunting for	Hours hunted	Number seen
	GROUSE	997	1185
	HARE	411.5	91
	RABBIT	72	3
	SQUIRREL	5	1
	WOODCOCK	277	112

2000	Hunting for	Hours hunted	Number seen
	GROUSE	990.3	790
	HARE	179	64
	RABBIT	32.5	0
	SQUIRREL	11	4
	WOODCOCK	447.5	149

2001	Hunting for	Hours hunted	Number seen
	GROUSE	1438.25	1639
	HARE	460.5	220
	RABBIT	48	0
	SQUIRREL	9.5	18
	WOODCOCK	339	665

2002	Hunting for	Hours hunted	Number seen
	GROUSE	1014.5	1346
	HARE	393.5	154
	RABBIT	0	0
	SQUIRREL	4	4
	WOODCOCK	412.3	644

2003	Hunting for	Hours hunted	Number seen
	GROUSE	1190.7	1373
	HARE	654	287
	RABBIT	81.5	12
	SQUIRREL	20	35
	WOODCOCK	454.2	735

2004	Hunting for	Hours hunted	Number seen
	GROUSE	3643	3609
	HARE	309.5	159
	RABBIT	3	1
	SQUIRREL	69	38
	WOODCOCK	1567.25	1917

2005	Hunting for	Hours hunted	Number seen
	GROUSE	1517.5	1187
	HARE	575.5	309
	RABBIT	23.5	5
	SQUIRREL	44	17
	WOODCOCK	917	1227

Table 7. New Hampshire small game hunter observation rates for dog hunters only (1999-2005).

Species	Observation Rates Per 100 Hunter Hours						
	1999	2000	2001	2002	2003	2004	2005
GROUSE	118.86	79.77	113.96	132.68	115.31	99.1	78.24
HARE	33.78	38.55	47.77	39.14	43.88	51.37	53.73
RABBIT	16.67	24.62	0.00	0.00	14.72	33.33	21.73
SQUIRREL	0.00	0.00	0.00	0.00	0.00	55.07	38.63
WOODCOCK	227.44	192.63	196.17	156.20	161.82	122.31	133.8

Table 8. New Hampshire grouse observation rates by region by year for dog hunters.

Number of Ruffed Grouse Observed Per 100 Hunter Hours

	1999	2000	2001	2002	2003	2004	2005
NORTH	149.90	112.00	128.79	144.77	118.64	135.71	114.65
WHITE MNTS	172.19	117.81	174.07	177.03	158.74	113.59	46.84
CENTRAL	130.08	106.58	105.90	62.93	104.90	76.26	43.80
SOUTHWEST	60.10	49.83	44.75	37.14	42.86	38.06	31.58
SOUTHEAST	134.88	56.60	68.07	87.18	60.53	20.57	19.13

Table 9. New Hampshire woodcock observation rates by region by year for dog hunters.

Number of Woodcock Observed Per 100 Hunter Hours

	1999	2000	2001	2002	2003	2004	2005
NORTH	362.67	156.76	181.43	138.33	127.57	235.55	174.40
WHITE MNTS	253.13	259.76	128.36	183.01	263.93	155.4	153.76
CENTRAL	234.93	155.73	145.97	154.86	123.08	79.38	110.83
SOUTHWEST	100.00	212.59	316.06	122.11	127.14	102.53	147.42
SOUTHEAST	139.53	125.58	60.00	93.75	190.70	70.96	85.71

Table 10. Grouse observation rates calculated from data provided by bow hunter survey respondents.

Mean Observations per 100 Hunter Hours per Region

Year	NORTH	WHITE MTNS.	CENTRAL	SOUTHWEST	SOUTHEAST
1997	36.50	29.40	14.40	17.51	11.20
1998	38.60	40.20	15.60	13.81	11.40
1999	53.40	35.00	14.40	13.09	5.60
2000	29.05	24.86	16.21	12.19	6.78
2001	47.39	39.72	17.42	11.89	8.23
2002	34.41	32.99	9.92	10.45	5.52
2003	34.55	24.78	12.82	9.70	3.90
2004	33.11	36.61	11.35	6.95	4.79
2005	26.14	30.37	8.24	11.65	4.69

Table 11. Ruffed grouse survey route results.

YEAR	Drumming events heard per survey stop				
	NORTH	WHITE MOUNTAINS	CENTRAL	SOUTHWEST	SOUTHEAST
1999	0.70	0.63	0.24	0.21	0.15
2000	0.70	0.62	0.36	0.10	0.18
2001	0.84	0.84	0.54	0.44	0.03
2002	0.95	0.79	0.57	0.30	0.08
2003	0.40	0.58	0.43	0.45	0.14
2004	0.56	0.58	0.23	0.18	0.00
2005	0.68	0.85	0.42	0.50	0.00
2006	0.45	0.44	0.28	0.25	0.06

Table 12. North Country grouse drumming events heard per survey route stop per year.

Year	Grouse drumming events heard per survey stop
	1996
1997	0.40
1998	0.52
1999	0.54
2000	0.67
2001	0.74
2002	0.76
2003	0.60
2004	0.41
2005	0.73
2006	0.48

Table 13. Woodcock Singing ground survey results (2006).

YEAR	Male Woodcock Heard Per Stop Per Region				
	NORTH	WHITE MTNS	CENTRAL	SOUTHWEST	SOUTHEAST
1999	0.70	0.48	0.53	0.30	0.15
2000	0.67	0.36	0.31	0.25	0.10
2001	0.91	0.24	0.24	0.10	0.05
2002	0.54	0.29	0.40	0.22	0.00
2003	0.68	0.47	0.22	0.20	0.20
2004	0.62	0.40	0.20	0.23	0.30
2005	0.86	0.40	0.28	0.08	0.13
2006	0.62	0.22	0.31	0.30	0.35

New Hampshire Small Game Management Regions



Appendix 5. Data Form For 2006 Grouse Routes.

YEAR 2006 RUFFED GROUSE & TURKEY SURVEY DATA FORM
NH FISH AND GAME DEPARTMENT

ROUTE NUMBER (USE ASSIGNED ROUTE NUMBERS ONLY): _____
 WMU: _____ Town: _____ Date of Survey: ____/____/____
 Observer's Name: _____ Was this route run by you last year? _____
 If Volunteer, please provide your phone number: _____

OFFICIAL SUNRISE _____:_____		SKY CONDITION		TEMP		WIND (MPH)				PRECIP											
ROUTE START TIME _____:_____		___ Clear	___ 1/4 Overcast	___ 1/2 Overcast	___ 3/4 Overcast	___ 3/4 Overcast	Fahrenheit	___ 35-39	___ 40-49	___ 50-59	___ 60+	___ Calm	___ Gentle (1-3)	___ Light (4-7)	___ Moderate (8-12)	___ Strong (> 12)	___ None	___ Mist	___ Snow	___ Fog	___ Light Rain
Stop #	Odometer Reading	Time	Total Drumming Events Heard	Total No. Gobblers Heard	Disturbance				Comments												
					Low	Mod	High	<u>Reject</u>													
1	.	:																			
2	.	:																			
3	.	:																			
4	.	:																			
5	.	:																			
6	.	:																			
7	.	:																			
8	.	:																			
9	.	:																			
10	.	:																			
		TOTALS																			

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY

1. Record the total number of **grouse drumming events** heard; **not** the number of individual grouse heard.
2. Record the total number of **individual gobblers** (male turkeys) heard; **not** the number of **gobblers** heard.
3. Conduct surveys between 15 April and 10 May
4. Begin routes 30 minutes BEFORE sunrise.
5. Stops should be at 1- mile intervals.
6. Listen for exactly 4 minutes.
7. Do not conduct surveys if temperatures are below normal, or in moderate wind or persistent rain.
8. Mail all completed forms by 5/20 to Julie Robinson, NH Fish & Game Dept, Region 3, 225Main Street, Durham, NH 03824.
9. Under "Disturbance" only check **Reject** if disturbance is dramatic enough to warrant rejection of the stop as a survey point.
10. Questions should be directed to Julie Robinson 868-1095, cell # 419-0198.

Appendix 6. Ruffed grouse survey route data for 2006.

RT NO.	WMU	TOWN	DATE	GROUSE	TURK	STOPS	OBSERVER
<u>NORTH</u>							
01	B	DUMMER	05/05/06	03	00	10	JKELLY
02	D1	WHITEFIELD	04/28/06	02	02	10	ATIMMINS
03	D1	LANCASTER	05/02/06	10	01	10	ATIMMINS
04	B	COLUMBIA	05/01/06	05	02	10	WSTAATS
05	C2	BERLIN	05/08/06	04	00	10	JKELLY
06	C2	MILAN	05/02/06	04	00	10	JKELLY
07	B	STRAFFORD	05/09/06	06	00	10	WSTAATS
08	A	CLARKSVI	05/04/06	02	01	10	WSTAATS
35	D	BETHLEHEM	--/--/--	00	00	00	JKELLY
				36	06	80	
Birds Per Stop				.45	.07		
<u>WHITE MOUNTAINS</u>							
09	E	JACKSON	04/27/06	06	05	10	BABRAMS
10	F	CAMPTON	05/05/06	03	00	10	JKNEELAND
11	E	CHATHAM	04/22/06	03	10	10	KBONTAITES
12	D2	BENTON	05/04/06	07	02	10	GJELLISON
13	D2	SUGAR HILL	04/27/06	04	05	10	ATIMMINS
14	F	RUMNEY	--/--/--	00	00	00	SWEBER
				22	24	50	
Birds Per Stop				.44	.48		
<u>CENTRAL</u>							
15	I1	WEBSTER	04/21/06	06	02	10	EROBINSON
16	J2	PITTSFIELD	04/19/06	01	02	10	JROBINSON
17	G	CANAAN	05/09/06	04	01	10	TDAKAI
18	J1	TUFTON	04/20/06	02	00	10	KBONTAITES
19	J1	FREEDOM	04/19/06	04	07	10	KBONTAITES
20	I1	HILL	04/21/06	11	01	10	SBRESNAHAN
21	G	GRAFTON	05/10/06	02	00	10	TDAKAI
22	J2	GILMANTON	05/05/06	02	01	10	CBRIDGES
				22	14	80	
Birds Per Stop				.28	.18		
<u>SOUTH WEST</u>							
23	H1	LANGDON	04/25/06	05	08	10	TWALSKI
24	H1	CROYDON	04/27/06	00	07	10	TWALSKI
25	I2	GOSHEN	04/26/06	06	06	10	TWALSKI
26	H2	NELSON	04/30/06	00	01	10	TWALSKI
27	I2	HILLSBORO	04/28/06	02	07	10	TWALSKI
28	H2	WINCHESTER	04/29/06	02	10	10	JROBINSON
29	K	SHARON	04/20/06	01	03	10	JROBINSON
40	K	LYNDEBORO	04/27/06	04	05	10	JROBINSON
				20	37	80	
Birds Per Stop				.25	.46		

Appendix 6 grouse data, continued.

RT NO. WMU TOWN DATE GROUSE TURK STOPS OBSERVER

SOUTH EAST

30	L	DOVER	04/19/06	00	00	10	JROBINSON
32	M	CHESTER	04/30/06	00	00	10	EORFF
33	L	ALLENSTOWN	05/04/06	00	00	00	EORFF
34	M	DERRY	--/--/--	00	00	00	JROBINSON
36	M	SANDOWN	04/22/06	02	03	10	JROBINSON

				02	03	30	
Birds Per Stop				.06	.10		

2006 NORTH COUNTRY GROUSE INDEX

RT. NO.	WMU	TOWN	DATE	GROUSE	TURK	STOPS	OBSERVER	LOCAL NAME
06	C2	MILAN	05/02/06	04	00	10	JKELLY	Mary Grande
07	B	STRAFFORD	05/09/06	06	00	10	WSTAATS	Nash Stream
08	A	CLARKSVI	05/04/06	02	01	10	WSTAATS	Cedar Stream
50	A	PITTSBURG	05/08/06	06	00	10	WSTAATS	Smith Brook
51	A	PITTSBURG	05/12/06	09	01	10	WSTAATS	Indian Stream
52	A	ERROL	05/09/06	02	00	10	WSTAATS	Greenough Pd.
53	B	MILLSFIELD	--/--/--	--	--	--	DROP 2004	Millsfield Loop
54	A2	DARTMOUTH	--/--/--	00	00	00	BOOMA	Loomis
55	A2	DARTMOUTH	--/--/--	00	00	00	KEVANS	Swift
56	A2	DARTMOUTH	--/--/--	00	00	00	BOOMA	Deadon

			29	02	60		
Birds Per Stop					.48	.03	

2006 MISC GROUSE ROUTES

RT. NO	WMU	TOWN	DATE	GROUSE	TUR	STOPS	OBSERVER	LOCAL NAME
70	D	BENTON	4/20/06	14	00	10	AJOHNSTON	WMNF
71	F	THORNTON	5/5/06	03	00	10	AJOHNSTON	WMNF
72	E	JEFFERSON	5/9/06	00	00	10	MARCHOWSKY	WMNF
73	E	ALBANY	5/5/06	00	00	10	MICIO	WMNF
74	E	BEANS PUR	5/3/06	01	02	10	MILOT	WMNF
75		ALBANY	5/5/06	03	01	10	ROWSE	WMNF
76		GORHAM	5/5/06	02	00	10	WITHERELL	WMNF
77	A	PITTSBURG	5/4/06	06	00	10	JKELLY	CT LAKES

** Route will change to Jackson in 2007

Appendix 7. Woodcock survey results for 2006.

2006 WOODCOCK ROUTE RESULTS

*INCLUDES FEDERAL ROUTES ASSIGNED BY THE WATERFOWL PROJECT
AND 9 ROUTES (BOLD TEXT/NO'S 100-108) RUN FOR THE SMALL GAME PROJECT*

RT. NO. WMU TOWN DATE WOODC STOPS OBSERVER

NORTH REGION

001	A	PITTSBURG	05/05/06	03	10	WSTAATS
002	B	STARK	05/09/06	05	10	ATIMMINS
003	B/C2	ERROL	05/09/06	07	10	WSTAATS
100	D1	LANCASTER	05/10/06	10	10	ATIMMINS
101	B	COLUMBIA	05/1/06	06	10	WSTAATS

31 50

Woodcock Per Stop .62

WHITE MOUNTAINS REGION

004	E	BETHLEHEM	05/04/06	04	10	ATIMMINS
005	E	PINKHAM NOT	05/08/06	03	10	ATIMMINS
006	D2	WARREN	04/30/06	02	10	KBORDEAU
106	E	CHATHAM	04/30/06	02	10	KBONTAITES
108	E	SACO (E.BR)	--/--/00	--	--	DROPPED
109	E	BEAR NOTCH	05/09/06	00	10	KBONTAITES**

11 50

Woodcock Per Stop .22

CENTRAL REGION

010	G	ALEXANDRIA	04/27/06	01	10	KBORDEAU
007	J1	MOULTONBO	04/27/06	10	10	KBONTAITES
011	I1	CONCORD	05/04/06	02	10	SWHEELER
104	I1	FRANKLIN FA	04/26/06	03	10	KBORDEAU
108		EFFINGHAM	05/08/06	00	10	KBONTAITES
105	J2	LOUDON	05/04/06	03	10	JROBINSON

19 60

Woodcock Per Stop .31

SOUTH WEST REGION

009	H1	PLAINFIELD	04/29/06	04	10	EROBINSON
014	H2/I2	STODDARD	05/05/06	00	10	EROBINSON
013	H2	WALPOLE	--/--/--	--	--	TWALSKI
015		MT VERNON	--/--/--	00	00	LRyder
018		RICHMOND	05/07/06	00	00	TWALSKI
102	H1	LANGDON	04/26/06	05	10	TWALSKI
103	I2	HILLSBORO	05/08/06	07	10	JROBINSON

16 40

Woodcock Per Stop .30

SOUTH EAST REGION

012		BARRINGTON	04/30/06	03	10	EORFF
107	L	EPSOM	--/--/--	00	00	EORFF
017	M	KENNSINGTO	05/07/06	04	10	JROBINSON

07 20

Woodcock Per Stop .35

Appendix 7. Woodcock survey results continued.

RT. NO. WMU TOWN DATE WOODC STOPS OBSERVER

DARTMOUTH COLLEGE – 2ND COLLEGE GRANT

110	LAMB VAL	--/--	00	00	GBOOMA
111	SOUTH SWIF	--/--	00	00	KEVANS
112	WINTER RD	--/--	00	00	KEVANS
113	LOOMIS	--/--	00	00	GBOOMA
114	DEAD DIA	--/--	00	00	KEVANS
115	4-MILE	--/--	00	00	KEVANS
116	SWIFT DIA	--/--	00	00	KEVANS
			00	00	

Woodcock per stop .00

Performance Report

State: New Hampshire

Grant W-89-R-6

Grant Type: Survey and Inventory

Period Covered July 1, 2005 – June 30, 2006

Grant Title: SMALL GAME RESEARCH AND MANAGEMENT

Project VII

Job 3: Formulation Of Small Game Population Management Recommendations

Job Objective: Science-based recommendations consistent with the achievement of small game goals and objectives will be developed and evaluated on an annual and biennial basis.

Summary: The Department Small Game Team, consisting of 5 Department wildlife biologists, reviewed current New Hampshire small game hunting seasons and concluded that no change in the existing seasons was required.

Target Date: June 30, annually

Status of Progress: On schedule

Deviations: None

Total Cost:

Procedures: Hunting seasons are established on a biennial basis through the administrative rule-making process. Information from preceding hunting seasons is evaluated in conjunction with short and long-term trend information. Initial season recommendations are developed by the Small Game Project Leader and reviewed, evaluated and modified as necessary by the Small Game Team. Input from regional biologists and law enforcement staff is considered, initial recommendations are reviewed by the Small Game Team, and a preliminary season recommendation is subsequently developed at the Wildlife Programs Committee meeting for evaluation by the Executive Director and Commission. These preliminary recommendations are presented at public hearings around the state and public comments are incorporated by the Small Game Team and a final recommendation developed for approval by the Commission and Executive Director. Only costs incurred up to, and including, final season recommendations will be charged to the grant.

Results: The Department Small Game Team (which oversees management of ruffed grouse, cottontail rabbit, snowshoe hare and gray squirrel) discussed the status of small game species in New Hampshire, and considered possible changes in our current small game seasons, as part of the Department's biennial rule-making process. The team concluded, based on the best available small game data (see Jobs 1 and 2 of this project) and the expressed interest of small game hunters, that no changes in the current small game hunting framework were warranted at the present time.

Conclusions: New Hampshire's current small game hunting framework adequately satisfies the Department's stewardship responsibilities and the recreational interests of our constituents.

Recommendations: No change in this job is recommended.

Submitted by

Julie Robinson
Small Game Project Leader
July 1, 2006

Performance Report

State: New Hampshire

Grant W-89-R-6

Grant Type: Survey and Inventory

Period Covered July 1, 2005 – June 30, 2006

Grant Title: SMALL GAME RESEARCH AND MANAGEMENT

Project VII

Job 4: Professional Exchange And Dissemination Of Project Information

Job Objective: To communicate with diverse small game stakeholders and the general public interested in small game management in New Hampshire. To facilitate peer, legislative and public reviews of small game management programs. To maintain working relationships and information exchange with small game management professionals and insure that the small game project leader is trained in the use and best available small game management methods and techniques. To prepare and disseminate in timely fashion, an annual small game management report to cooperators, the general public, and the media, and to prepare and deliver Federal Aid reports as required.

Summary: The small game project leader met with assorted small game interest groups in order to: share project information and survey results, promote interest in small game, discuss technical issues, provide technical support, to receive public input and opinion, and to inform and educate the public. The annual small game summary report was created and distributed, and Federal Aid reports were completed as required.

Target Date: June 30, annually

Status of Progress: On schedule

Deviations: None

Total Cost:

Procedures: An annual small game summary report detailing results from hunter surveys and population monitoring efforts, will be produced and distributed to survey respondents and inquiring members of the general public. The booklet will also be distributed to interested media, various Fish and Game offices for public dissemination, and in response to in-state and out of state hunting inquiries. The booklet contents will be used as an annual source of news releases, popular articles, technical information, and public presentations. Approximately 3,000 reports will be printed annually, unless experience indicates greater production is warranted. Communication of small game species status, management goals and accomplishments will be facilitated through a variety of techniques including presentations, new releases, correspondence and phone calls, and other means as warranted. Required Federal Assistance performance reports will be completed annually.

Results: The 2005/06 small game summary report (see Appendix 1) was completed. A total of 1,500 copies of the report will be printed and distributed in the summer of 2006. Copies of the report will be sent to previous survey participants in order to encourage their continued survey participation. In addition, copies of the report will be sent to prospective survey participants in an effort to encourage their future participation. Reports will be distributed by Fish and Game Commissioners and wildlife staff in order to encourage interest in and knowledge of New Hampshire small game species.

The small game project leader worked with and presented information to a number of small game partners. Activities included: speaking at a banquet for a new chapter of The Ruffed Grouse Society; working with the Ruffed Grouse Society on habitat projects, and; working with the Atlantic Flyway Technical Committee woodcock group on research needs and season issues. The project leader also provided technical support to landowners interested in managing their lands for small game species and provided information to outdoor writers from throughout the country on small game issues in New Hampshire.

Finally, the project leader shared survey information and results with Department small game team members, and completed Federal Aid reports in a timely and professional manner.

Conclusions: Based on positive input received to date, focused distribution of small game summary reports leads to increased survey participation rates and heightened interest in our state small game resources. The survey activities of this project generate information of great public interest, and serve to create interest in both small game population and habitat management.

Recommendations: No change in this job is recommended. The annual small game summary report will continue to be used to encourage survey participation, to educate the public and, to create interest in and appreciation for New Hampshire small game resources. The Small Game Project Leader will continue to actively interact with all interested parties in order to maximize project success.

Submitted by

Julie Robinson
Small Game Project Leader
July 1, 2006

Appendix I. 2005/2006 New Hampshire Small Game Summary Report.

Note: The embedded object below is an electronic version of the “2005/2006 New Hampshire Small Game Summary Report” in PDF format. To open it for viewing or printing requires that the Adobe Reader be installed on your computer.



2005-2006SGReport.
pdf