

State: Georgia
Grant Number: 8-1
Study Number: 6

LONG RANGE PERFORMANCE REPORT

Grant Title: State Funded Wildlife Survey

Period Covered: July 1, 1998 - June 30, 1999

Study Title: Wild Turkey Production and Population Indices

Study Objectives:

1. To determine annually an index of statewide turkey populations and production success in Georgia.
2. To organize data obtained in a form so that it can be used in sound management of turkeys in Georgia.

Abstract

The statewide production index, poults seen per observer, for 1998 was 37 % higher than the 1997 index. In addition, the population index, hours hunted by cooperators per turkey seen, for 1999 was 17.6 % lower than in 1998. An inverse correlation coefficient of $r = -0.86$ is obtained between the annual production and population indices for the entire survey period which began in 1978. Hunter success has remained at 70 % over the last 3 years of the survey.

A. Activity:

Job A. Turkey Production Index Survey - This survey was conducted during the months of May through August from 1978 to 1991. Beginning in 1991, the survey period was shortened to June through August when statistical analysis of data indicated the shorter time period was adequate. Data collection and summary for the 1999 survey period is not complete.

Cooperators involved in data collection for this survey were field personnel of the Game Management Section, Fisheries Management Section, and Law Enforcement Section of the Wildlife Resources Division. Observations were those made during the course of their regular field duties. No special efforts were made to locate turkeys for the survey.

Records were maintained of all turkey broods and hens, with and without broods. The average number of poults seen per observer has proven to be the best measure to use as an index of production. Data were compiled on a statewide and physiographic region basis.

Job B. Turkey Hunting Population Index Survey - The hunter cooperators participating in the survey were obtained from names of prospects submitted by WRD personnel and current cooperators. Cooperators were also solicited through newspaper and magazine requests and programs to interest groups. In addition to these, randomly selected members of the Georgia Chapter of the National Wild Turkey Federation were contacted to bring the total potential cooperating hunters to 2,000.

This survey is conducted during the regular spring gobbler hunting season which begins the third Saturday in March and ends May 15. Specific information requested about each hunting trip was the date, hours hunted, county or physiographic region hunted, the number of turkeys seen, and the number of gobblers heard. Kill information was also asked for, but was an optional item. Hunt record forms were supplied to all cooperators along with full instructions and a short newsletter on survey findings from previous years.

The number of turkeys observed per unit of hunting effort is used as an index of the hunting season population. The correlation between the population indices and the production indices are used in evaluating annual production and populations and in making comparisons for trends. Data were calculated on a statewide and physiographic region basis.

B. Target Date for Achievement and Accomplishments:

Job A. Planned dates and dates of accomplishment coincide, June 30, 1999.

Job B. Planned dates and dates of accomplishment coincide, June 30, 1999.

C. Significant Deviations:

Job A. None

Job B. None

D. Finds:

Job A. In 1998, 595 broods were observed (Table 1). This total is substantially higher than in 1997 but is likely a result of the addition of the Fisheries Management personnel as observers for the first time. The average brood size of 7.0 poults is the fourth lowest in the history of the survey but is 8 % higher than the 1997 average of 6.5.

The production index of 22.1 poults seen per observer is 37 % higher than that for 1997 and is the third highest index in the survey's history (Table 3). The production index for each physiographic region was also up from 1997, except in the Lower Coastal Plain, with a particularly strong increase in the Valley and Ridge - Lookout Mountain Plateau for the second consecutive year.

The number of hens reported totaled 1,717 (Table 4). This total can be misleading as an indicator due to variations in the number of observers from year to year. The percent of hens with poults, 48 %, was 9 percentage points higher than the 1997 total (Table 5). The average number of poults per hen, 2.4, was up 33% from 1997 which was the lowest in the history of the survey. Production rebounded from the poor numbers of 1996-97 and can be considered fair to good.

Job B. Usable hunt data was supplied by 439 cooperators. These cooperators reported spending a total of 18,458 hours hunting (Table 6). The average season hunter effort was 11.9 trips totaling 42.0 hours. They reported observing 13,208 turkeys and hearing 7,677 gobblers. The statewide population index of 1.4 was 17.6 % lower than that for 1998 (1.7). The effort per gobbler heard of 2.4 hours equaled that for the 1998 season. The least hunting effort per turkey seen occurred in the Valley & Ridge - Lookout Mountain Plateau region, and the greatest in the Blue Ridge Mountains and Piedmont Plateau. For the fourth consecutive year, effort per gobbler heard was least in the Upper Coastal Plain and highest in the Blue Ridge Mountains. Peak gobbling activity, 1.8 gobblers heard per trip, occurred on both the first (Mar 20-21) and second weekends (Mar 27-28) of the season (Table 8). After the first seven days of the season the number of gobblers heard per trip was approximately equal to the figures observed during 1998.

The statewide gobbler harvest during the first seven days of the season amounted to only 25.5 % of the total season harvest, down for the second consecutive season (Table 9). Peak harvest was generally seen in the first fourteen days of the season in all parts of the state with the exception of the Blue Ridge Mountains where peak harvest occurred much later (Tables 10 and 11).

As for previous seasons, the greatest number of trips was made during the first seven days of the season (Tables 12 & 13). Only minor variations in hunting effort measures have occurred over the years.

Hunter success remained high at 67 % with 295 of 439 hunters reporting kill taking at least one gobbler. Of these, 119 (27 %) hunters took one bird, 85 (19 %) took two birds, and 67 (15 %) took three birds. Twenty (20) hunters (5 %) reported taking or participated in taking more than three birds. Cooperators reported 65 gobblers killed by companions.

A relatively high inverse correlation, $r = -0.86$, continues to be indicated between the production index, poults per observer, and the population index, hours per turkey observed. (Correlation coefficient calculations exclude production indices for 1986 and 1994 and population indices for 1987 and 1995 due to aberrations associated with severe drought and flood.) With a 1998 production index of 22.1, the predicted 1999 population index is 1.6. The actual index from hunter observations is 1.4.

Table 1. Turkey broods and poult observed statewide in Georgia, 1978-1998.

Year	Broods		Poults		Est. Total
	Total	Poult Counts	Brood Average		
1978	123	82	8.6		1,058
1979	183	160	8.6		1,565
1980	176	169	8.4		1,479
1981	264	241	7.6		2,006
1982	260	218	7.7		2,002
1983	298	261	8.8		2,622
1984	293	247	6.8		1,992
1985	324	274	7.2		2,333
1986	430	377	9.4		4,042
1987	347	328	9.7		3,366
1988	347	321	7.9		2,741
1989	322	306	9.0		2,898
1990	459	278	7.6		3,488
1991	289	213	7.1		2,039
1992	298	274	6.8		2,027
1993	328	303	8.2		2,676
1994	341	316	9.4		3,209
1995	408	386	10.4		4,209
1996	271	239	7.5		2,033
1997	408	304	6.5		2,613
1998	595	534	7.0		4,185

Table 2. Turkey brood observations by physiographic region and month in Georgia, 1998.

Month	Region ¹					Total
	I	II	III	IV	V	
June	20	12	37	29	10	142
July	59	21	89	56	19	281
August	30	17	71	14	17	168
Totals	109	50	197	99	46	595

¹Roman numerals correspond to physiographic regions as follows:

- I - Valley and Ridge Lookout Mountain Plateau
- II - Blue Ridge Mountains
- III - Piedmont
- IV - Upper Coastal Plain
- V - Lower Coastal Plain

Table 3. Average number of turkey poult seen per observer (production index) in Georgia, 1978-98.

Physiographic																	
Region	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
I	4.84	0	4.80	3.45	3.52	10.30	9.09	7.20	23.19	27.87	22.10	30.70	18.92	21.19	15.93	26.75	38.68
II	11.18	5.70	3.85	5.32	10.36	21.21	16.54	7.90	36.62	19.79	34.61	21.82	19.89	7.07	12.89	17.31	20.11
III	7.04	8.88	11.13	12.12	14.79	20.24	11.01	15.93	22.99	23.11	18.80	21.72	23.06	20.69	15.90	22.03	25.22
IV	3.86	5.16	5.23	7.15	11.44	9.42	8.78	15.03	23.03	11.54	12.01	12.72	10.83	7.71	7.84	14.91	19.17
V	6.28	7.36	3.63	8.89	5.37	5.19	6.37	10.93	13.74	6.60	9.32	8.12	20.10	5.27	10.32	11.15	8.00
Statewide	7.50	6.33	7.31	8.72	10.77	13.29	10.02	13.07	22.42	17.31	16.05	17.53	18.88	12.01	12.39	16.39	20.63

Table 3. Continued.

Physiographic				
Region	1995	1996	1997	1998
I	66.3	32.3	20.8	42.9
II	22.06	16.2	13.7	21.5
III	48.99	26.9	26.6	29.5
IV	21.0	16.5	14.1	22.6
V	14.83	4.5	9.1	6.2
Statewide	31.78	18.9	16.2	22.1

Table 4. Turkey hens observed with poults, without poults, and uncertain of accompanying poults statewide in Georgia, 1978-98.

Year	Hens Reported			Total
	With Poults	Without Poults	Uncertain of Poults	
1978	145	70	26	241
1979	176	131	39	346
1980	166	133	15	314
1981	276	116	66	458
1982	327	136	24	487
1983	361	211	72	644
1984	261	232	59	552
1985	475	251	81	807
1986	648	283	84	1,015
1987	519	230	52	801
1988	529	305	59	893
1989	459	261	48	768
1990	642	371	49	1,062
1991	321	399	59	779
1992	407	490	59	956
1993	374	292	41	707
1994	463	361	66	890
1995	606	301	83	990
1996	298	384	74	756
1997	560	618	271	1,449
1998	820	661	236	1,717

Table 5. Percent of turkey hens accompanied by poults (2nd potential population index) and the average number of poults per hen statewide in Georgia, 1978-98.

Year	Percent Hens With Poults	Poults Per Hen
1978	60	4.4
1979	51	4.5
1980	53	4.7
1981	60	4.4
1982	67	4.1
1983	56	4.1
1984	47	3.6
1985	59	3.6
1986	64	4.4
1987	65	4.2
1988	59	3.1
1989	60	3.8
1990	60	3.3
1991	41	2.6
1992	43	2.1
1993	56	3.8
1994	56	3.6
1995	61	4.3
1996	39	2.7
1997	39	1.8
1998	48	2.4

Table 6. Summary of turkey hunter cooperator data in Georgia, 1999.

Item	Physiographic Region ¹					Statewide
	I	II	III	IV	V	
Total Hunters	39	21	232	96	51	439
Total Hours	1,677	1,012	9,562	4,062	2,035	18,458
Total Trips	504	284	2,485	1,300	613	5,214
Avg. Hours	43.0	48.2	41.2	42.3	39.9	42.0
Avg. Trips	12.9	13.5	10.7	13.5	12.0	11.9
Avg. Hrs./Trip	3.3	3.6	3.8	3.1	3.3	3.5
Total Turkeys Seen	1,962	377	6,479	2,991	1,367	13,208
Hrs./Turkeys Seen	0.9	2.7	1.5	1.4	1.5	1.4
Total Gobblers Heard	622	270	3,361	2,352	1,030	7,677
Hrs./Gobbler Heard	2.7	3.7	2.8	1.7	2.0	2.4
Total Kill	57	19	272	170	79	598
Companion Killed	3	1	13	43	5	65
Hours/Kill	28.0	50.6	33.6	19.1	24.2	27.8

¹Roman numerals correspond to physiographic regions as follows:

- I - Valley and Ridge Lookout Mountain Plateau
- II - Blue Ridge Mountains
- III - Piedmont
- IV - Upper Coastal Plain
- V - Lower Coastal Plain

Table 7. Turkey hunting population indices in Georgia, 1979-1999.

Population Index	Hunt Season	Physiographic Region					Statewide
		I	II	III	IV	V	
Hours/Turkey Seen	1979	20.5	3.5	2.9	3.1	2.8	3.0
	1980	1.6	6.0	2.9	2.6	2.4	3.1
	1981	1.5	4.7	2.2	3.2	2.8	2.5
	1982	2.2	5.0	2.8	3.3	1.8	2.9
	1983	2.5	3.1	2.2	2.0	1.9	2.3
	1984	2.2	4.1	2.4	1.6	1.5	2.3
	1985	2.3	3.4	2.6	2.5	3.5	2.6
	1986	3.2	4.6	2.3	2.0	3.4	2.5
	1987	4.1	2.9	2.6	1.7	2.1	2.4
	1988	1.0	2.9	1.9	1.6	2.1	1.8
	1989	1.7	2.3	2.3	1.6	1.2	1.9
	1990	1.8	2.8	2.0	1.9	1.7	2.0
	1991	1.6	2.3	2.0	1.7	1.8	1.9
	1992	1.4	2.7	2.4	1.7	2.3	2.1
	1993	2.0	4.0	2.5	1.6	1.6	2.1
	1994	2.4	2.2	2.1	1.6	1.4	1.9
	1995	1.7	2.2	2.4	1.8	2.0	2.1
	1996	1.2	1.8	1.6	1.6	1.5	1.5
	1997	1.0	2.1	1.8	1.5	1.3	1.6
	1998	1.0	1.9	1.9	1.7	1.4	1.7
1999	0.9	2.7	1.5	1.4	1.5	1.4	
Hours/Gobbler Heard	1979	50.7	7.3	3.3	2.1	1.8	3.2
	1980	2.9	4.7	3.4	2.9	9.1	3.4
	1981	2.9	4.4	3.0	2.3	2.0	2.9
	1982	3.1	3.6	3.0	2.3	2.3	2.9
	1983	4.4	2.8	3.3	2.0	2.4	2.8
	1984	3.1	5.2	3.3	1.8	1.4	3.0
	1985	2.4	4.2	2.9	1.8	3.0	2.6
	1986	2.6	3.4	2.1	1.3	1.6	2.0
	1987	2.2	5.2	2.4	1.7	2.0	2.4
	1988	1.5	2.6	2.7	1.4	1.6	2.2
	1989	2.1	2.1	2.1	1.5	2.1	1.9
	1990	2.3	4.2	2.5	1.7	1.7	2.2
	1991	2.7	5.5	2.7	2.0	2.9	2.7
	1992	2.4	4.2	2.9	1.8	1.6	2.6
	1993	3.2	6.3	3.6	2.1	2.7	3.1
	1994	3.4	6.1	3.5	1.9	2.2	2.9
	1995	2.0	3.3	2.5	1.9	2.1	2.3
	1996	3.3	3.5	2.7	2.0	2.1	2.5
	1997	2.3	5.6	2.2	1.6	2.2	2.2
	1998	2.5	4.1	2.7	1.9	2.1	2.4
1999	2.7	3.7	2.8	1.7	2.0	2.4	

Table 7. Continued.

Population Index	Hunt Season	Physiographic Region					Statewide
		I	II	III	IV	V	
Hours/Gobbler	1979	96.5	79.8	35.1	27.5	23.3	35.7
Killed	1980	13.2	35.7	39.6	35.8	19.1	35.9
	1981	10.7	29.5	31.0	29.9	23.0	30.7
	1982	25.5	90.3	29.7	30.0	19.0	31.3
	1983	30.9	29.7	27.8	28.3	22.6	27.4
	1984	31.1	45.8	35.3	31.4	12.8	34.0
	1985	22.2	48.2	38.7	24.0	32.4	33.6
	1986	23.0	42.1	28.6	21.9	16.0	26.7
	1987	35.4	68.3	30.4	25.8	32.1	32.1
	1988	17.6	25.3	35.9	18.9	18.7	28.0
	1989	22.6	41.4	29.8	17.0	21.1	24.8
	1990	29.8	55.2	29.3	26.4	16.3	28.3
	1991	42.7	48.4	36.9	24.7	23.2	33.9
	1992	44.9	49.4	45.3	20.9	22.0	36.7
	1993	32.2	46.5	46.0	19.8	38.7	34.9
	1994	36.2	42.0	36.9	20.9	18.7	30.1
	1995	25.4	29.9	25.3	18.6	18.7	22.7
	1996	28.9	34.1	29.3	25.9	26.0	26.8
	1997	28.7	38.8	31.9	19.6	20.7	27.7
	1998	29.2	35.8	29.2	23.3	19.0	26.3
	1999	28.0	50.6	33.6	19.1	24.2	27.8

Table 8. Number of turkey gobblers heard per hunting trip in Georgia, 1999.

Date		Physiographic Region					Statewide
Weekend	Weekday	I	II	III	IV	V	
3/20-3/21		1.2	0.1	1.6	2.5	2.2	1.8
	3/22-3/26	0.9	0.4	1.5	2.3	1.8	1.6
3/27-3/28		1.3	0.8	2.0	2.1	1.6	1.8
	3/29-4/02	1.2	0.4	1.4	1.9	1.8	1.5
4/03-4/04		1.5	0.7	1.8	2.1	1.7	1.7
	4/05-4/09	1.3	1.7	1.4	1.9	1.8	1.6
4/10-4/11		1.5	1.4	1.5	1.3	1.6	1.4
	4/12-4/16	1.3	0.8	1.0	1.6	1.5	1.2
4/17-4/18		1.6	0.6	1.2	1.9	1.8	1.4
	4/19-4/23	1.3	0.9	1.4	1.6	2.5	1.5
4/24-4/25		1.4	1.9	1.0	1.6	1.5	1.3
	4/26-4/30	1.4	1.1	1.0	1.1	0.9	1.1
5/01-5/02		1.4	1.5	0.8	1.1	0.7	1.0
	5/03-5/07	0.8	1.0	0.7	1.1	0.8	0.9
5/08-5/09		0.8	0.9	1.2	1.4	1.9	1.3
	5/10-5/15	1.0	0.9	0.8	1.2	0.9	0.9
Season		1.2	1.0	1.4	1.8	1.7	1.5

Table 9. Chronological summary of turkey gobbler harvest in Georgia, 1999.

Date		Gobblers	% of Season Kill	
Weekend	Weekday	Killed	Date	Cumulative
3/20-3/21		96	14.5	14.5
	3/22-3/26	73	11.0	25.5
3/27-3/28		56	8.4	33.9
	3/29-4/02	66	9.9	43.9
4/03-4/04		43	6.5	50.4
	4/05-4/09	43	6.5	56.9
4/10-4/11		38	5.7	62.6
	4/12-4/16	42	6.3	68.9
4/17-4/18		25	3.8	72.7
	4/19-4/23	39	5.9	78.6
4/24-4/25		33	5.0	83.6
	4/26-4/30	20	3.0	86.6
5/01-5/02		28	4.2	90.8
	5/03-5/07	22	3.3	94.1
5/08-5/09		12	1.8	95.9
	5/10-5/15	27	4.1	100.0
Total		663	100.0	100.0

Table 10. Chronological distribution of turkey gobbler harvest by physiographic region in Georgia, 1999.

Dates		Physiographic Region					Statewide
Weekend	Weekday	I	II	III	IV	V	
3/20-3/21		8	0	49	29	10	96
	3/22-3/26	4	1	26	26	16	73
3/27-3/28		5	1	20	23	7	56
	3/29-4/02	2	1	33	17	13	66
4/03-4/04		5	1	16	19	2	43
	4/05-4/09	8	0	19	10	6	43
4/10-4/11		2	1	26	7	2	38
	4/12-4/16	4	2	15	16	5	42
4/17-4/18		5	1	7	8	4	25
	4/19-4/23	1	2	18	13	5	39
4/24-4/25		4	1	12	10	6	33
	4/26-4/30	3	0	7	6	4	20
5/01-5/02		3	4	14	6	1	28
	5/03-5/07	1	2	10	9	0	22
5/08-5/09		1	1	4	5	1	12
	5/10-5/15	4	2	9	9	2	27
Total		60	20	285	213	84	663

Table 11. Chronological distribution of turkey gobbler harvest (%) by physiographic region in Georgia, 1999.

Date		Physiographic Region					Statewide
Weekend	Weekday	I	II	III	IV	V	
3/20-3/21		13.3	0.0	17.2	13.6	11.9	14.5
	3/22-3/26	6.7	5.0	9.1	12.2	19.0	11.0
3/27-3/28		8.3	5.0	7.0	10.8	8.3	8.4
	3/29-4/02	3.3	5.0	11.6	8.0	15.5	9.9
4/03-4/04		8.3	5.0	5.6	8.9	2.4	6.5
	4/05-4/09	13.3	0.0	6.7	4.7	7.1	6.5
4/10-4/11		3.3	5.0	9.1	3.3	2.4	5.7
	4/12-4/16	6.7	10.0	5.3	7.5	6.0	6.3
4/17-4/18		8.3	5.0	2.5	3.8	4.8	3.8
	4/19-4/23	1.7	10.0	6.3	6.1	6.0	5.9
4/24-4/25		6.7	5.0	4.2	4.7	7.1	5.0
	4/26-4/30	5.0	0.0	2.5	2.8	4.8	3.0
5/01-5/02		5.0	20.0	4.9	2.8	1.2	4.2
	5/03-5/07	1.7	10.0	3.5	4.2	0.0	3.3
5/08-5/09		1.7	5.0	1.4	2.3	1.2	1.8
	5/10-5/15	6.7	10.0	3.2	4.2	2.4	4.1

Table 12. Chronological distribution of turkey hunting trips by physiographic region in Georgia, 1999.

Dates		Physiographic Region					Statewide
Weekend	Weekday	I	II	III	IV	V	
3/20-3/21		38	15	266	128	58	506
	3/22-3/26	54	23	270	168	94	609
3/27-3/28		31	20	200	105	45	404
	3/29-4/02	51	17	220	122	65	475
4/03-4/04		34	21	164	74	41	334
	4/05-4/09	52	23	220	112	56	464
4/10-4/11		33	26	172	62	29	322
	4/12-4/16	36	18	143	71	37	305
4/17-4/18		24	16	115	67	26	249
	4/19-4/23	32	23	136	74	35	302
4/24-4/25		26	14	122	53	28	245
	4/26-4/30	28	15	62	55	31	198
5/01-5/02		13	19	99	38	18	190
	5/03-5/07	18	10	78	46	18	174
5/08-5/09		13	8	78	37	8	146
	5/10-5/15	21	16	136	87	23	285
Total		504	284	2,481	1,299	612	5,208

Table 13. Chronological distribution of turkey hunting trips (%) by physiographic region in Georgia, 1999.

Dates		Physiographic Region					Statewide
Weekend	Weekday	I	II	III	IV	V	
3/20-3/21		7.5	5.3	10.7	9.9	9.5	9.74
	3/22-3/26	10.7	8.1	10.9	12.9	15.4	11.7
3/27-3/28		6.2	7.0	8.1	8.1	7.4	7.8
	3/29-4/02	10.1	6.0	8.9	9.4	10.6	9.1
4/03-4/04		6.7	7.4	6.6	5.7	6.7	6.4
	4/05-4/09	10.3	8.1	8.9	8.6	9.2	8.9
4/10-4/11		6.5	9.2	6.9	4.8	4.7	6.2
	4/12-4/16	7.1	6.3	5.8	5.5	6.0	5.9
4/17-4/18		4.8	5.6	4.6	5.2	4.2	4.8
	4/19-4/23	6.3	8.1	5.5	5.7	5.7	5.8
4/24-4/25		5.2	4.9	4.9	4.1	4.6	4.7
	4/26-4/30	5.6	5.3	2.5	4.2	5.1	3.8
5/01-5/02		2.6	6.7	4.0	2.9	2.9	3.6
	5/03-5/07	3.6	3.5	3.1	3.5	2.9	3.3
5/08-5/09		2.6	2.8	3.1	2.8	1.3	2.8
	5/10-5/15	4.2	5.6	5.5	6.7	3.8	5.5