

AN EVALUATION OF THE WILD TURKEY RESTORATION PROGRAM
" IN WESTERN VIRGINIA

by

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INTRODUCTION

Realizing a need for an evaluation of turkey restocking in Virginia, the Virginia Cooperative Wildlife Research Unit initiated this project at the request of the Virginia Commission of Game and Inland Fisheries. The primary purposes of the project were to evaluate the several restocking methods, to determine the success achieved, to evaluate the factors relating to the success of restocking, and to submit recommendations concerning future turkey restocking projects in Virginia.

This investigation of the Virginia wild turkey restocking program was limited to the counties west of the Blue Ridge and one county, Patrick County, located east of these mountains. The investigational area includes present and former native wild turkey range. It includes areas of high human population with limited forest lands and areas of low human population with 30 to 50 thousand acres of wilderness forest lands. The investigational area and the current occupied and unoccupied wild turkey range within this region are shown in Figure 1.

This investigation was carried out during the period April, 1953 through March, 1954. Field data were collected through interviews of Commission personnel and by personal inspection of the area by the writer.

Terms used in this report are defined as follows:

Survival - indicates the number of restocked turkeys plus their progeny expressed as a percent of the total number of turkeys restocked.

Turkey - indicates native or game farm raised Eastern wild turkeys (Meleagris gallopavo silvestris, Vieillot) unless otherwise designated.

Unoccupied turkey range - refers to habitat which, as far as is known, did not contain any native turkey population immediately prior to restocking.

Occupied turkey range - refers to habitat which currently supports a native turkey population.

Areas of high human population - in the vicinity of turkey liberation sites, indicates an area with nine or more human habitations within a one mile radius of turkey release points.

Areas of low human population - in the vicinity of turkey liberation sites, indicates an area with five or less human habitations within a one mile radius of turkey release points.

HISTORY OF WILD TURKEY RESTOCKING

Wild turkey restocking is not a new idea, for as early as 1905 the Pennsylvania Game Commission initiated a wild turkey trapping and transplanting program in an effort to build up turkey populations in depleted habitat (Latham, 1941). Since that time the restocking of turkeys has been tried in many of the 48 states, with some states having an extensive turkey restocking program over a long period of time.

A nationwide survey, made about 1929, indicated that "wild turkey culture" had been tried by 26 states and abandoned by eight states (Boyer, n.d.). Boyer's survey indicated that 17 states had used game farm raised wild turkeys. Nine of these states reported failures and the remaining eight reported unknown success. Data presented by Boyer indicated that only two states, New Mexico and Arizona, had used trapped wild turkeys for restocking depleted areas. New Mexico reported the use of trapped wild turkeys as being successful, "...in many cases." Arizona gave no details except to state that, "...in placing turkeys raised in captivity it is best to trap a pair of wild turkeys and to release them all together" (Boyer, n.d., p. 13).

It was thought at the time of Boyer's survey that the methods then used to produce game farm turkeys could be improved to produce "wilder" turkeys for restocking; the hope was also implied that improved methods of production would increase the success of turkey restocking programs utilizing game farm raised birds.

Selective breeding of "wilder" turkeys, for restocking purposes, was attempted by three state game commissions (Virginia, Pennsylvania,

and Missouri) during the 1930's. The method used in each case was the annual crossing of native wild gobblers to wild strain hens held in captivity. Missouri initiated their program in 1932 (Leopold, 1944, pp. 143-4), Pennsylvania in 1936 (Gerstell and Long, 1939, p. 2), and Virginia began experimenting with the method in 1935 (Mosby and Handley, 1943, pp. 183-4). Virginia and Pennsylvania have continued to produce turkeys using this system. Missouri, after trying this system for 12 years and releasing approximately 11,400 turkeys, discontinued in 1943 the use of all game farm raised wild turkeys in restocking attempts (Leopold, 1944, pp. 143-5). Another nationwide wild turkey survey, made by the Virginia Cooperative Wildlife Research Unit in 1954, indicated that 38 states have tried turkey restoration, of which seven have abandoned and five states were undecided on continuance of further turkey restocking. One of the latter group indicated that a renewal of their restocking program would be considered if trapped wild turkeys were available (Cantner, 1954). Data on the success and future of turkey restocking plans of state game commissions are presented in Table 1. The information presented in this table indicates that the trend of turkey restoration projects is towards the use of trapped wild turkeys rather than use of game farm raised wild turkeys. This trend seems logical in view of the much greater reported success attained with the use of trapped wild turkeys.

Comparative data obtained from several states on the relative success attained using trapped wild or game farm raised wild turkeys

Table 1. Results of a national survey of state game commission turkey restocking programs (Data compiled from Cantner, 1954)

A. Reported success of turkey restocking by 36 states*

<u>States reporting stock as</u>	<u>States reporting success as</u>					<u>Total</u>
	<u>Excel-</u>	<u>Mode-</u>	<u>Satis-</u>	<u>Fail-</u>	<u>Un-</u>	
<u>Trapped wild or</u> <u>Game farm birds</u>	<u>lent</u>	<u>rate</u>	<u>factory</u>	<u>ure</u>	<u>known</u>	
Trapped wild only	4	0	5	0	0	9
Both - report trapped wild restocking as	5	5	1	0	0	11
<u>Total</u>	<u>9</u>	<u>5</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>20</u>
Game farm only	1	1	1	11	2	16
Both - report game farm turkeys as	1	3	1	6	0	11
<u>Total</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>17</u>	<u>2</u>	<u>27</u>

B. Reported future plans of turkey restocking by 26 states planning to continue restocking

<u>Have used</u>	<u>Trapped wild</u>	<u>Future source of turkeys</u>		<u>Total</u>
		<u>Game farm</u>	<u>Both</u>	
Trapped wild	9	0	0	9
Game farm	2	3**	1	6
Both sources	8	0	3	11
<u>Total</u>	<u>19</u>	<u>3</u>	<u>4</u>	<u>26</u>

* Two states reported failures for birds of unknown origin.

** One state in this group reported a desire to stock trapped wild turkeys if available.

seem to indicate why the national trend is towards the use of trapped wild turkeys in restocking. Ideal comparative situations where there are no native turkeys present on an area before restocking are difficult to find; therefore, the desirable type data are not generally available. Information on the success attained in several states using game farm or trapped wild turkeys is presented in Table 2. Information on the success of Virginia's restocking attempts is not included in this section but will be presented later. No positive information as to the actual numbers stocked and success achieved in Pennsylvania was available although from reports of qualified men the program appears to have been highly successful. Both Virginia and Pennsylvania have liberated game farm raised wild turkeys.

Success of restocking Merriam's wild turkeys in Arizona is indicated by Ligon (1946, p. 76). He reports that several hundred turkeys present in Arizona resulted from restocking New Mexico trapped wild turkeys. Reports from Texas indicate that they encountered failure in many attempts to restock trapped wild turkeys but gave no details as to the number released or the number of unsuccessful attempts (Texas, 1945, pp. 22-23).

There seems to be a sharp delineation between the success attained from restocking trapped wild and game farm turkeys. Information in Table 2 and other data obtained by this writer indicates that in a majority of cases the restocking of trapped wild turkeys has resulted in better than 100.0 percent survival whereas the most successful attempts to restock game farm turkeys resulted in less than 40 percent survival.

Table 2. Relative success of restocking with game farm and trapped wild turkeys on unoccupied range

State and source of stock	Subspecies	No. of turkeys released	Number surviving	Percent survival	Restocking period		Reference
					Years	Date	
A. Game farm turkeys							
Florida	<u>sylvestris</u>	244	94	38.5	1*	1953	Frye & Chamberlain, 1953
Louisiana	"	568	95	16.7	4	1949-53	Moody & Collins, 1953
Total		812	189	23.3			
B. Trapped wild turkeys							
Georgia	<u>sylvestris</u>	12	200	1666.6	10	1943-53	Ambrosen, 1954
Kentucky							
Beaver Creek	"	37	135	364.9	6	1947-53	Hoody, 1953
Mammoth Cave	"	8	50	625.0	6	1947-53	Hoody, 1953
South Carolina							
Sandhills	"	55	60	109.1	5	1949-54	Wamble, 1954
Bull's Island	"	14	125	892.9	13	1940-53	Baldwin, 1954
Florida							
Peace River	<u>osceola</u>	162	2800	1728.4	4	1949-53	Stanberry & Gainey, 1953
Colorado	<u>merriami</u>	37	540	1459.5	2	1944-46	Burgett, 1947
South Dakota	"	28	3000	10714.3	7	1948-53	S.D. Cons. Digest, 1954
Utah	"	16	41	256.3	2	1952-54	Cantner, 1954
Wyoming	"	15	600	4000.0	7	1935-42	Coughlin, 1943
Total		384	7551	1966.4			

* Actually 8-10 months

Wild turkey restocking by the Virginia Commission of Game and Inland Fisheries was initiated in the early spring of 1929, when 150 game farm raised wild turkeys were purchased from an out-of-state game breeder. The following year the Commission established its own wild turkey propagation farm (Handley, 1938). Selective breeding to obtain "wilder" turkeys by an annual back-crossing of captive hens with free ranging native wild gobblers was first tried in Virginia in 1935. All turkeys raised at the game farm after 1939 were produced using this method of selective breeding (Mosby and Handley, 1943, pp. 182-184).

Various types of release methods using game farm turkeys have been tried in Virginia. The direct release method, in which the turkeys are given their freedom immediately upon their arrival at the release site, was largely used in Virginia from about 1929 until 1938-1940. It is still being used to some extent at the present time (1954). About 1939-1940, the holding-pen method was used to a limited extent and by 1946-1947 most of the turkeys released west of the Blue Ridge were released using this method. Holding-pen releases involve the use of small pens, approximately six feet wide, six feet high, and 30-40 feet in length. The turkeys are held in these pens for an "acclimation period" of about one week before they are released. The propagation-pen system, similar to the system used in Pennsylvania as described by Kozicky (1948), was first used in Virginia on an experimental basis in 1953. Under this release method 20 hens and two gobblers are placed in a fenced enclosure of from four to eight acres in size. Released turkeys are permitted to breed, nest, and produce young within the enclosure situated in an area to be restocked. The propagation-pen

program in Virginia was expanded and 12 pens of this type were placed in operation in April, 1954.

An interest in the possibility of utilizing trapped wild turkeys in the Virginia wild turkey restoration program has been expressed for a number of years. The difficulty of making use of this source of stock has been in locating an area from which wild turkeys could be trapped without arousing public resentment to the program in the area to be trapped. Arrangements were made with the United States Forest Service to attempt trapping of up to 15 turkeys from the Big Levels Refuge, Augusta County, in the fall of 1953. Trapping attempts, up to the time of this report, have been unsuccessful.

METHODS

Compilation of Restocking Records

Restocking records of game farm raised wild turkeys were obtained from two sources: (1) the files of the Virginia Commission of Game and Inland Fisheries and (2) the Virginia Cooperative Wildlife Research Unit. The records of restocking were assembled to show the total number of turkeys released by counties and as much information as was available concerning the type of releases for the period 1929 to June 30, 1953. The complete records, on a county basis, for the 24½ year period are presented in Appendix Tables 1A-F.

Survival of Restocked Turkeys

Survival, as previously defined, refers to survival of restocked turkeys and their progeny. Turkeys released in the fall of 1953 or birds used in the spring of 1954 in the propagation-pen experiments, discussed later, are not included in this survival study. As far as possible, all restocked turkeys and their progeny were segregated from other free ranging birds by close observation of game wardens, game managers, and other field personnel.

Information on survival was collected from Commission, Forest Service, and other field personnel who possessed an intimate knowledge of the terrain and turkeys within their respective areas. During the fall of 1953 each warden and manager in counties of the area studied was contacted to obtain records of all turkeys known to be living in the area. Game wardens and game managers were considered indispensable in judging the reliability of turkey reports from interested individuals

in their assigned areas and such reports were accepted if, in the judgment of these men, the information was reliable.

Information gathered was classified into two primary categories: (1) information from occupied turkey range and (2) information from unoccupied turkey range. Every effort was taken to distinguish restocked birds and their progeny from native stock but it would be facetious to believe that this was done without error.

In unoccupied turkey habitat, the data were further subdivided on a basis of the number of occupied human habitations within a mile radius of release points as determined from the 1945 Virginia Highway Department County Maps of Primary and Secondary Roads. This division was made in an attempt to determine if a greater number of reports of released turkeys were available from areas with a higher human population density. Therefore areas in which there were nine or more human habitations were classified as areas of "high human population," while areas in which there were five or less human habitations were classified as areas of "low human population." There were no areas having six, seven, or eight human habitations within a one mile radius of release points.

Data from restocking records were then compared with the reported "survival" as of late summer and the fall of 1953. An evaluation of the restocking attempts were then expressed as a survival percentage in which the number of turkeys restocked was the denominator and the known survival times 100 as the numerator.

Evaluation of Turkey Release Methods

During twenty-four and a half years of turkey restocking, several

different release methods were tried. As defined in the INTRODUCTION, there were seasonal (1) direct, and (2) holding-pen releases. Release records were inspected in order to locate areas where only one release method was used, e.g., a fall holding-pen, a fall direct, a spring holding-pen, or a spring direct release. It seems logical to assume that if at a single release point more than one of these four types of releases were used that survival results would be difficult to evaluate completely. At only a very limited number of release points had only one release method been used; therefore, the evaluation of the influence, if any, of use of different release methods was almost impossible due to the limited amount of data available.

Evaluation of Known Causes of Losses in Restocked Turkeys

Data on the known causes of losses of restocked turkeys were obtained from game wardens and game managers. These losses included deaths due to predation or other unknown causes. All turkeys which refused to stay in the wild and moved into farms to live were considered "losses" in this investigation.

Evaluation of Turkey Restocking in Occupied Range

In an attempt to obtain a better understanding of the success of turkey restocking within occupied range, turkey population changes within restocked areas were compared with population changes within "similar" areas not stocked.

In order to define areas on which population changes were studied, it was necessary to know the distance travelled by a majority of turkeys after release. Evidently, this distance is extremely variable. It was assumed that the majority of turkeys released would not travel

farther than three miles from their release point. This figure was derived from field notes of Mosby (1936) on observations of turkeys released in Augusta County. Thus restocked areas and unstocked comparison areas were defined as areas circumscribed by a circle three miles in radius. The release point was used as the center in restocked areas.

Turkey census data used in an attempt to evaluate the success of restocking on occupied range were by Mosby in 1938 and McDowell in 1953. Mosby's data were collected prior to restocking and McDowell's after restocking. These data may be only of limited value as it appears that the extent and degree of accuracy of the censuses varied. It should be noted that their reports were not based on personal observations.

Game Warden, Game Manager Opinion Survey

This survey was made to study possible factors influencing the success of turkey restocking and to evaluate their relative importance. Thirty-two wardens and 19 game managers were interviewed using a standard questionnaire (Appendix Table 2). Identical questions were asked all respondents in an attempt to reduce interviewer bias.

Various sources of error probably resulted from the method of survey. The major sources of error are thought to be: (1) men in favor of restocking, for any reason, might have tried to answer questions favorably to restocking, and conversely, men not in favor of restocking might have tried to answer questions unfavorably to restocking; (2) the ability of respondents to interpret questions may have varied; and (3) the interviewer may have biased the response. A personal interview was desirable as a postal questionnaire would probably have been a

complete failure due to non-response, misinterpretation of questions, and deliberate misrepresentation.

The questionnaire included questions regarding the respondent's opinion on: (1) turkey restocking, (2) preferred game species, (3) knowledge of release points, (4) protection of released turkeys by residents, (5) limiting factors affecting the turkey population, (6) reproduction of released turkeys, (7) wildness of released turkeys, (8) need of further releases, (9) release methods, and (10) opinion on the success of restocking. A resident was considered a person living within a warden's or game manager's assigned area. Items (1), (2), (3), and (4) referred only to residents as reported by wardens and game managers. Respondents were given three choices of ten limiting factors. These choices were weighted using the following method: first choice, 5 points; second choice, 3 points; and third choice, 1 point. Answers to other questions were not weighted, the number of respondents reporting various answers being presented directly.

All men interviewed were not qualified to answer every question asked, e.g., men not qualified to answer a question were not requested to answer it and, consequently, were not included in the tabulations.

Propagation-Pen Evaluation

The propagation-pen method of restocking turkeys was tried for the first time in Virginia on an experimental basis under this project. In the spring of 1953, three pens were constructed and a smaller pen, already in existence in Augusta County, were utilized in an effort to determine the relative success of this method as compared to other restocking methods used in Virginia. As mentioned previously, the

method used was similar to the propagation-pen method used in Pennsylvania as described by Kozicky (1948).

Where possible, pen sites were chosen which met the following general specifications: (1) location within or adjacent to favorable forest habitat; (2) enclosure of small grassy field, mixed hardwood growth with scattered pines, brush entangled section of thick cover, and (3) a small flowing brook. Pens were constructed with stock fencing to enclose an area of four to eight acres. Fencing was constructed five feet high and fitted tightly to the ground. Range type poultry feeders were used to feed the turkeys.

Operational specifications for best results are believed to be: (1) place all pens in operation by April 1, or as soon thereafter as weather conditions permit; (2) designate one man and an alternate to operate the pen; (3) limited and minimum association of operator with the turkeys; (4) intensive predator control before turkeys are released continued until the poults are large enough to spring predator traps; (5) daily tabulation of nests, eggs, poults, and brood stock.

Twenty-two wing-clipped turkeys were used at each pen of the specified size. Ten hens and one gobbler were placed in each propagation-pen and another ten hens and one gobbler were held as replacements in holding-pens beyond the sight of turkeys in the propagation-pen. The turkeys in the replacement pens are transferred to the propagation-pen as soon as it is established that predators, if any, have been controlled in and around the propagation-pen. Normally all turkeys are transferred to the propagation-pen within ten days or two weeks.

The four pens utilized in this experiment were located as follows: (1) Dickenson County, Breaks of Sandy; (2) Craig County, Barbour's Creek; (3) Alleghany County, Dolly Anne Wildlife Area; and (4) Augusta County, Big Levels Refuge. The first three pens were constructed according to the general specifications outlined. The pen on Big Levels Refuge in Augusta County was much smaller than specified because an existing enclosure, only one-half acre in size, built as a nursery for game food plants was utilized. A general resume of conditions at each pen follows:

At site No. 1, predator control was initiated before the pen was put into operation and continued until the poults were large enough to spring the predator traps. The turkeys were not disturbed by excessive observation. This pen was approximately six to eight acres in size.

The pen at site No. 2 satisfied the site specifications but lacked the strict predator controls desired. Turkeys in this pen were not disturbed by excessive observation. This pen was approximately four to six acres in size.

The pen at site No. 3 satisfied the specifications of site selection and had strict predator controls. The turkeys in this pen were observed closely by many individuals. The pen was approximately four acres in size.

The pen at site No. 4 was not originally constructed as a propagation-pen and did not satisfy site specifications. This pen was approximately one-half acre in size.

Game managers were assigned to the pens and asked to keep a record of observations. Each of the pens was visited periodically by the writer to collect data on nests, eggs, broods, and brood stock. In case of serious developments, extreme predation or disease, the writer acted as a "trouble shooter."

RESULTS

Compilation of Restocking Records

Turkey restocking records show that within a period of 24½ years 11,077 game farm raised wild turkeys have been released in Virginia by the Virginia Commission of Game and Inland Fisheries (Appendix Tables 1A-F).

These records show that a total of 4,826 turkeys were released within the area west of the Blue Ridge Mountains and Patrick County, representing 43.6 percent of the state total. Fall releases in this area accounted for 33.1 percent, spring releases 5.7 percent, and unknown releases 4.7 percent of the state total (Table 3).

A majority of the birds were released during the period June 30, 1948 to June 30, 1953. During this five year period 7,843 turkeys were released throughout Virginia, representing 70.8 percent of the total of all birds released in the state. Within the area studied 3,614 turkeys were released during this period, representing 32.6 percent of the state total.

During the five year period, 1948-1953, records were more complete as to the number of turkeys dead in shipment, release points, and date of release. Release records for the five year period show that 41 turkeys, or 1.1 percent of the total, shipped to the area studied died during shipment.

Survival of Restocked Turkeys

The total known survival, as of the late fall of 1953, of restocked turkeys on the area was 369 birds, representing 7.7 percent of the total

Table 3. Number of turkeys released within 32 western Virginia counties during the period 1929 through June, 1953

County	Spring releases	Fall releases	Season unknown	Total
Alleghany	69	104	32	205
Augusta	37	78	154	269
Bath	16	22	33	71
Bland	1	335	8	344
Botetourt	4	12	6	22
Buchanan	0	56	2	58
Carroll	0	108	0	108
Clarke	29	35	5	69
Craig	42	147	6	195
Dickenson	21	412	4	437
Floyd	12	54	0	66
Frederick	30	0	0	30
Giles	14	252	45	311
Grayson	38	30	16	84
Highland	12	27	0	39
Lee	8	0	0	8
Montgomery	0	0	0	0
Page	35	15	2	52
Patrick	73	423	34	530
Pulaski	20	169	0	189
Roanoke	8	53	0	61
Rockbridge	4	35	12	51
Rockingham	29	28	20	77
Russell	8	0	0	8
Scott	8	417	0	425
Shenandoah	36	67	18	121
Smyth	39	348	14	401
Tazewell	0	0	70	70
Warren	35	25	2	62
Washington	8	356	21	385
Wise	0	60	2	62
Wythe	0	0	16	16
Total	636	3668	522	4826

number of turkeys released in the area. A tabulation of all reported survival of restocked turkeys or their progeny, as of late summer and the fall of 1953, is given in Table 4.

There appears to be a variation in known survival within the three divisions of the area studied (Table 5). This difference is probably due to: (1) difficulty in positively identifying restocked turkeys within occupied turkey range, (2) a larger number of observers on the area of high human population and subsequently a smaller number of observers on the area of low human population. Potential turkey range within the area of low human population consists of extensive unbroken and relatively untravelled forest land whereas the range within the area of high human population is made up of forest land that is well traversed by roads and people. These differences probably explain the difference in the number of turkeys known to have survived, i.e., the probability attached to any one observation is related to the human population density.

An examination of the data presented in Table 5 shows that the survival percent varied, in the several counties, from a minimum of zero to a maximum of 48.8 percent. The average survival in occupied range was 6.5 percent; the survival was 5.1 percent for those sections having a low human population density in unoccupied range; and in unoccupied range where the human population density was high, the survival percent was 13.2. As pointed out previously, the average survival for the entire 32 counties investigated was 7.7 percent. The writer makes no claim that the variations in the percent survival noted in the three subdivisions of the area investigated have any particular

Table 4. Number and location of restocked turkeys and their progeny known surviving in western Virginia as of the fall of 1953, exclusive of turkeys released in fall, 1953 and propagation-pen survival

Map No. refer- ence	County	Location in County	Observation	
			Date	No. of Turkeys
AREA I (occupied range)				
1.	Alleghany	Dolly Anne Area	1/11/54	12
2.	Augusta	Crimora Mining Co. area	11/ /53	7
3.	Augusta	" " " "	11/ /53	9
4.	Clarke	2 mi. SE of Berrys	1/5/54	2
5.	Clarke	2 mi. S of Berrys E of Shenandoah River	11/ /53	2
6.	Rockbridge	Donaldsburg	11/16-21/53	3
7.	Rockingham	Fulks Run	11/15/53	9
8.	Rockingham	Stony Run	11/15/53	14
9.	Warren	George Washington National Forest near Bentonville	11/ /53	3
10.	Warren	George Washington National Forest, S of Wakeman Mill	1/4/54	8
Subtotal for Area I				69
AREA II (unoccupied range, low human population)				
11.	Bland	Poor Valley, Tazewell Co. line	9/25/53	7
12.	Bland	Walker Mtn., Pulaski Co. line	12/2/53	5
13.	Bland	Walker Creek, Giles & Pulaski Co. lines	11/25/53	2
14.	Bland	Chestnut Ridge	11/16-21/53	2
15.	Craig	Potts Mtn. fire tower	11/16-21/53	12
16.	Giles	Kire, S fork Big Stony Creek	11/16-21/53	4
17.	Giles	Big stony Cr. 3 mi. S of Lon Oliver's home	11/1/53	2
18.	Giles	Big Mtn.	11/16-21/53	5
19.	Giles	N fork Big Stony Cr.	11/16-21/53	7
20.	Smyth	N of Press Martin's home on George's Branch	12/1/53	2
21.	Smyth	NE slope of Dickey Ridge	12/3/53	3
22.	Smyth	Hurricane Area, Shanty Brook	10/26/53	6
23.	Tazewell	Left branch Cove Cr.	9/28/53	20
24.	Tazewell	Clinch Mtn., head of Little Tumbling Cr.	11/21/53	1
25.	Washington	Headwaters of Straight Cr.	11/16-21/53	1
26.	Washington	Route #58, Feathercamp branch	11/12/53	3
27.	Wise	Little Stony Cr., High Knob fire tower	11/17-18/53	13
28.	Wise	N of Glades cabin	11/14/53	3
29.	Wise	Glades Area, Quarter Bottom	11/17/53	5
30.	Wise	Glades Area, head of Robinson fork	11/10/53	9
31.	Wise	Glades Area, Robinson Knob	11/9/53	6
Subtotal for Area II				121

Table 4. Number and location of restocked turkeys and their progeny known surviving in western Virginia as of the fall of 1953, exclusive of turkeys released in fall, 1953 and propagation-pen survival (continued)

Map No. refer- ence	County	Location in County	Observation	
			Date	No. of Turkeys
AREA III (unoccupied range, high human population)				
32.	Buchanan	Left Hurricane fork	12/3/53	9
33.	Buchanan	Left Hurricane fork	12/10/53	4
34.	Carroll	Woodlawn	12/11/53	2
35.	Carroll	Dugspur	12/15/53	20
36.	Carroll	Dugspur	12/15/53	5
37.	Dickenson	Deale's farm, Tivis	11/16/53	8
38.	Dickenson	Adam Childress's farm, Isom	11/14/53	8
39.	Dickenson	Charley Bruce Edwards, Tandy	11/4/53	13
40.	Grayson	Blaine McGrady, Baywood	11/1/53	8
41.	Grayson	Frank Sexton, Fries	11/14/53	5
42.	Grayson	Iron Mtn., E fork Turkey Fork Creek	11/16-21/53	5
43.	Grayson	Trial Justice Mathew's home near Pilot Knob	11/27/53	1
44.	Grayson	Brian Cox, Peach Bottom	11/3/53	11
45.	Grayson	Carsonville	12/3/53	11
46.	Patrick	Bull Mtn. fire tower trail	12/3/53	9
47.	Patrick	Edgar Simmon's farm, Stuart ½ mi. S of Stuart	11/15/53	23
48.	Patrick	Walter Givens, 2 mi. S of Stuart, E of Rt. #8	12/7/53	9
49.	Patrick	N fork Smith River headwaters	11/28/53	2
50.	Patrick	Floyd Co. line, near Rt. #8	11/16/53	1
51.	Patrick	Orlie Harris, head Elk Creek	12/15/53	6
52.	Patrick	Harry Clark, 4 mi. S of Stuart, 1 mi. E of Rt. #8	1/8/54	19
Subtotal for Area III				179
Total turkeys for area studied				369

Table 5. Known survival as of the fall of 1953 of turkeys stocked during the period from spring, 1929 to June 30, 1953*

County	Turkeys released	Known Survival	Percent Survival	Human habitation average
AREA I (Occupied range)				
Alleghany	199	12	6.0	1.0
Augusta	264	16	6.0	0.1
Bath	71	0	0.0	2.0
Botetourt	22	0	0.0	unknown
Clarke	69	4	5.8	2.0
Frederick	30	0	0.0	10.6
Highland	39	0	0.0	17.5
Page	52	0	0.0	2.2
Rockbridge	51	3	5.9	24.0
Rockingham	77	23	29.9	10.5
Shenandoah	121	0	0.0	0.0
Warren	62	11	17.7	10.0
Total	1057	69	6.5	
AREA II (Unoccupied range, low human population)				
Bland	344	16	4.7	4.0
Craig	173	12	6.9	1.0
Giles	311	20	6.4	3.5
Pulaski	189	0	0.0	5.0
Scott & Wise	487	37	7.6	0.0
Smyth	401	11	2.7	0.0
Tazewell	70	21	30.0	2.0
Washington	385	4	1.0	1.0
Total	2360	121	5.1	
AREA III (Unoccupied range, high human population)				
Buchanan	58	13	22.4	18.0
Carroll	108	27	25.0	26.0
Dickenson	416	29	7.0	16.0
Floyd	66	0	0.0	25.0
Grayson	84	41	48.8	17.6
Lee	8	0	0.0	unknown
Patrick	530	69	13.0	9.4
Roanoke	61	0	0.0	unknown
Russell	8	0	0.0	unknown
Wythe	16	0	0.0	unknown
Total	1353	179	13.2	

* Exclusive of the release and survival of 54 turkeys used in propagation-pens

significance. It seems clear, however, that the survival in all instances investigated in western Virginia is fairly comparable to the data from other states (see Table 2).

Evaluation of Turkey Release Methods

Data on the results attained in using four release methods are presented in Table 6. These data indicate that direct releases tend to be more successful than holding-pen releases. Comparative data on spring and fall releases were non-existent except for an area within occupied turkey range. In this area fall releases seem to result in a slightly higher percentage of survival than do spring releases.

The over-all survival using any of the four release methods seems to be extremely poor. Perhaps the major concern is the nature or character of the turkey being released rather than the release methods used.

Evaluation of Known Losses of Restocked Turkeys

Effort was made to assemble data on all known losses which occurred within the last five years (1948-1953) of the restocking program. Such losses included those due to predation, shipping losses, and turkeys living at farms (Table 7).

There appeared to be only a slight difference in the number of turkeys lost to known causes in the areas of high and low human population within unoccupied turkey range and in occupied turkey range. Within unoccupied range on the area of low human population, 15 turkeys, representing 0.8 percent, came to farm houses and were counted as a loss; on areas of high human population, 13 turkeys representing 1.2 percent of the total released were living at farms. In occupied turkey

Table 6. Comparative reported survival of restocked turkeys involving four types of release methods

County location	No. turkeys released		Survival		Release method
	Fall	Spring	No.	Percent	
<u>AREA I (Occupied range)</u>					
Angusta	10	0	16	160.0	Direct release
Rockbridge	10	0	3	30.0	Direct release
Rockingham	0	19	23	104.5	Direct release
Warren	0	35	11	31.4	Holding-pen
<u>AREA II (Unoccupied range, low human population)</u>					
Bland	282	0	16	5.7	Holding-pen
Giles	27	0	18	66.6	Direct release
Scott & Wise	392	0	37	9.4	Holding-pen
Washington	356	0	4	1.1	Holding-pen
<u>AREA III (Unoccupied range, high human population)</u>					
Buchanan	50	0	13	26.0	Direct release
Dickenson	370	0	29	7.8	Holding-pen

Table 7. Known losses of released turkeys, exclusive of birds used in the propagation-pens, during the period from fall, 1948 to spring, 1953

Area	Total released	<u>Dead on arrival</u>		<u>Dead after arrival</u>		<u>Living at farms</u>		<u>Total</u>	
		No.	Percent	No.	Percent	No.	Percent	No. lost	Percent
I	472	7	1.5	2	0.4	7	1.5	16	3.5
II	1966	31	1.6	35	1.8	15	0.8	81	4.1
III	1122	3	0.3	20	1.8	13	1.2	36	3.2
Total	3560	41	1.2	57	1.6	35	1.0	133	3.7

range, seven turkeys representing 1.5 percent of the birds released, were living at farms.

Turkeys lost in holding-pens at release site due to predation make up the total turkeys killed after arrival at release points. Two turkeys were killed, representing 1.5 percent of the total released on occupied range; on unoccupied range: 35 were killed, representing 1.8 percent of the total released on the low human population areas; and 20 killed, or 1.8 percent of those released on the areas of high human population.

Turkeys lost during shipment are as follows: occupied range, seven turkeys representing 1.5 percent; unoccupied range, low population area, 31 turkeys representing 1.6 percent; unoccupied range, high population area, three turkeys representing 0.3 percent of the turkeys released.

The known losses of turkeys during the period fall 1948--spring 1953 are presented in Table 7. Occupied turkey range is designated as Area I; unoccupied turkey range with a low human population is designated as Area II, and unoccupied range with a high human population is designated as Area III. These designations will be found in Table 7 and in all subsequent tables of this report.

It will be noted that the total of all known losses accounted for 133 turkeys representing 3.7 percent of the total released during the five year period.

Evaluation of Turkey Restocking in Occupied Range

The data on population changes in stocked and unstocked areas in occupied range are presented in Table 8 and the approximate location

of the comparison areas is presented in Figure 2. It was found that these data were not amenable for evaluation of population trends. The data are affected by several factors: (1) too many unknown size "turkey flocks," (2) census data were collected by different field personnel, (3) wilderness areas known to have had many turkeys show none or very few according to the censuses, (4) duplication and exclusion of turkey flocks was likely, and (5) lack of sufficient information on the range or distance travelled by released turkeys.

Game Warden, Game Manager Opinion Survey

Opinion of turkey restocking. Respondents reported that a majority of the county residents favor turkey restocking and have had no change of opinion since the initiation of turkey restocking (Table 9 A). There were more respondents indicating dissatisfaction with restocking in occupied native turkey range than in unoccupied range, probably resulting from fear of contamination of wild stock and the belief that there was sufficient wild stock on the range.

Restocking may fulfill two purposes under ideal conditions: (1) it may increase the turkey population, and (2) it may be a good public relations endeavor. Respondents may have favored restocking because of a belief in its public relations value.

Preferred game species. Respondents reported that residents were more in favor of increasing the turkey population than in increasing other game species (Table 9 B). The data indicate that there is nearly an equal interest in deer and turkey within occupied native turkey range while within unoccupied former turkey range containing a high human population more interest was shown in deer and in small game, i.e., quail, squirrel, and rabbit.

Table 8. Turkey population changes in occupied range, between 1938 and 1953, in stocked and unstocked areas

County	Area location number	1938, prior to restocking		1953, after restocking	
		No. flocks	No. turkeys/flock	No. flocks	No. turkeys/flock
A. Reported turkey populations on restocked areas					
Alleghany	1	2	-, -	6	19, 17, 16, 9, 7, 5,
Augusta	1	0	-	3	6, 4, 2,
Bath	1	2	-, -	4	7, 6, 1, -,
Highland	1	1	-	0	-
Shenandoah	1	2	-, -	3	3, -, -,
Total		7	-	16	102
B. Reported turkey populations on unstocked areas					
Augusta	1	4	6, -, -, -,	0	-
Augusta	2	3	8, -, -,	7	14, 10, 9, 9, 5, 3, 2,
Bath	1	1	-	3	5, 3, -,
Highland	1	3	10, 6, -,	2	22, 9,
Highland	2	1	16	2	17, 9,
Shenandoah	1	2	10, 1,	2	4, -,
Shenandoah	2	1	-	3	15, -, -, -, -,
Total		15	57	23	161

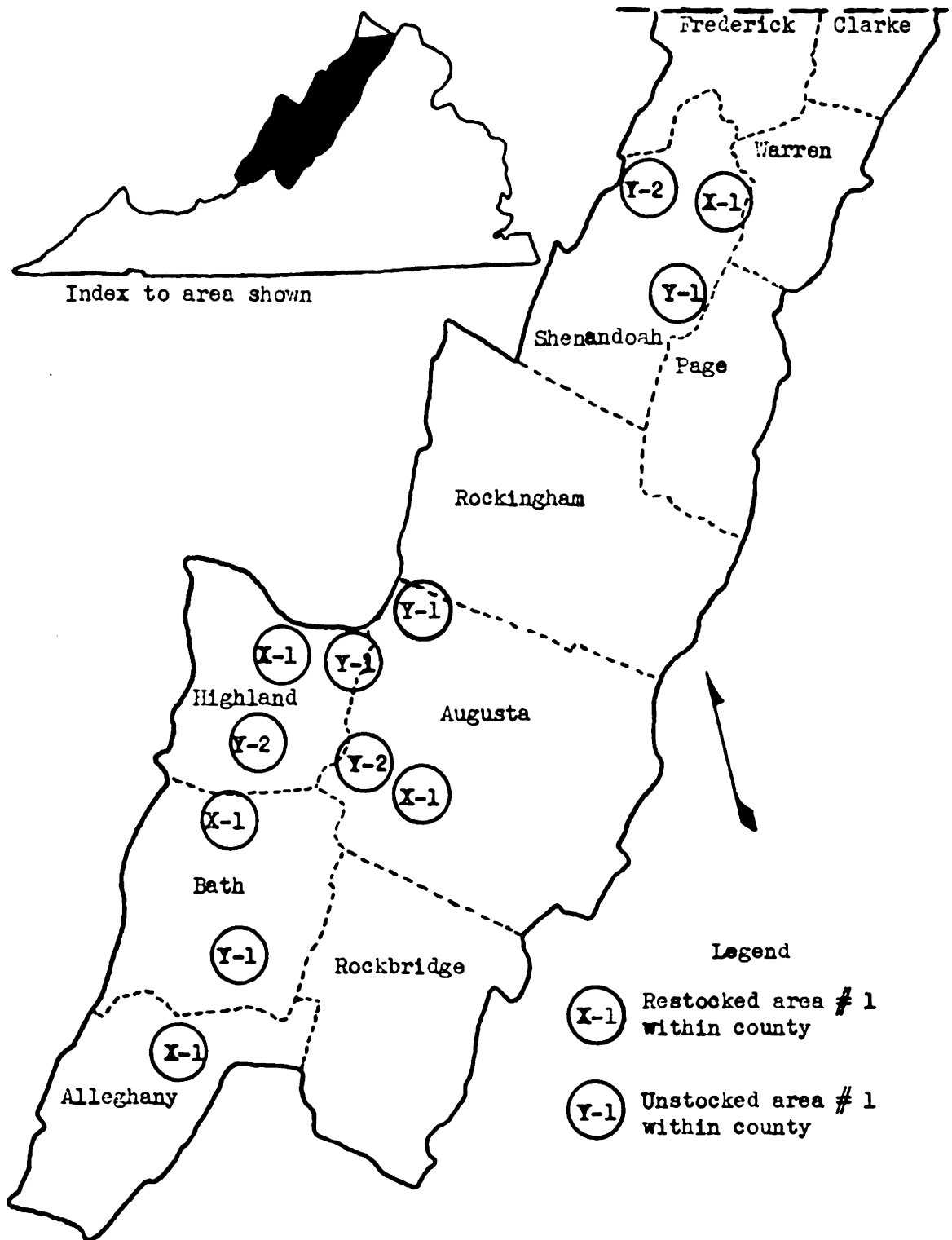


Figure 2. Location of comparison areas used in evaluating the effect of turkey restocking in occupied range

Table 9. Game warden - game manager opinion of possible factors influencing restocking success

A. Resident's opinion of restocking						
Area	In Favor	Not in Favor	Indifferent	<u>No. of respondents reporting</u> Change of opinion since restocking		
				More in favor,	Less,	No change
I	16	2	2	3	0	17
II	14	0	2	1	3	12
III	6	0	1	0	1	6

B. Preferred game species					
Area	Deer	<u>No. of respondents reporting</u>			
		Turkey	Quail	Squirrel	Rabbit
I	14	16	1	0	0
II	6	11	1	0	0
III	5	4	2	2	1

C. Resident's knowledge of release points				
Area	<u>No. of respondents reporting</u>			
	Intimate knowledge	Little knowledge	No knowledge	
I	3	11	6	
II	11	1	5	
III	5	2	0	

D. Protection of released turkeys by residents					
Area	<u>No. of respondents reporting</u>				
	<u>Poaching</u>		<u>Protecting</u>		<u>Both</u>
	Slight	Extensive	Slight	Extensive	Slight
I	7	1	8	9	5
II	10	0	6	8	1
III	5	0	1	6	0

Resident's knowledge of turkey release points. Respondents reported that a few residents within occupied native turkey range and most residents within unoccupied former turkey range know where turkeys are released (Table 9 C).

Protection of released turkeys by residents. Respondents indicate that there is more killing of released turkeys by residents in unoccupied former turkey range than in occupied turkey range (Table 9 D). In conjunction with the knowledge of release points the tendency to kill rather than protect restocked birds may be of considerable importance in establishing a sound restocking program.

Limiting factors. In general, reported limiting factors within the three sections of the area studied varied (Table 10). There was complete agreement on the most important factor, "predators other than dogs." Predators mentioned by respondents were the fox, bobcat, and great horned owl. "Dogs" and "lack of food" were included in the five most important factors in all areas. "Insufficient breeding stock" was mentioned as being important in unoccupied former turkey range and "illegal kill" of higher importance in occupied than in unoccupied turkey range.

Reproduction success. Respondents reporting broods produced in the spring after brood stock was released reported a higher rate of brood production and broods maturing on occupied than on unoccupied range. The lowest success of brood production was reported on unoccupied former turkey range in an area of low human population (Table 11 A).

Table 10. Limiting factors according to the game warden - game manager opinion survey

AREA I

Factors	No. of points
Predators other than dogs	74
Illegal kill	61
Lack of food	36
Weather conditions	27
Dogs	24
Lumbering	3
Disease	2
Insufficient breeding stock	1
Burning	0
Mowing	0

AREA II

Factors	No. of points
Predators other than dogs	42
Lack of food	39
Illegal kill	28
Dogs	21
Insufficient breeding stock	11
Weather conditions	4
Disease	3
Lumbering	1
Burning	0
Mowing	0

AREA III

Factors	No. of points
Predators other than dogs	28
Insufficient breeding stock	15
Dogs	13
Lack of food	8
Lumbering	5
Illegal kill	4
Weather conditions	3
Disease	1
Burning	1
Mowing	1

Table 11. Reproduction success within the area studied according to the warden - game manager opinion survey

A. Respondents reporting broods produced from turkeys the spring after their release

Area	No. respondents reporting					
	Broods produced as			Broods matured as		
	Yes	No	Unknown	Yes	No	Unknown
I	10	2	6	8	1	1
II	8	2	2	3	2	3
III	6	1	0	4	0	2

B. Respondents reporting reproduction and source on areas restocked

Area	No. respondents reporting					
	Reproduction as			Source as		
	Yes	No	Unknown	Native	Restocking	Unknown
I	21	1	0	12	11	4
II	5	7	1	0	5	0
III	5	2	0	0	5	0

Reports of reproduction by restocked turkeys indicate the highest rate of success is on native turkey occupied range and the lowest on areas of low human population within unoccupied range (Table 11 B).

Wildness of released turkeys. The majority of respondents reported that within occupied native turkey range released turkeys are sufficiently wild for restocking purposes. Within unoccupied range released turkeys were considered by the majority to be too tame for restocking purposes (Table 12 A).

Need of further releases. A majority of the interviewees reported that turkey restocking is needed or wanted (Table 12 B). There was a difference in degree of need reported in the three areas. Respondents from occupied turkey range show more opposition to further restocking than did respondents in unoccupied range. In Area II (low human population) there was a strong desire for a change in restocking methods.

Release method preference. Data on preference of methods used by men using these methods show that a spring release is favored over a fall release with a preference for the holding-pen type release rather than the direct release (Table 12 C). A spring release was greatly preferred in occupied native turkey range.

Opinion of success. Respondents from unoccupied former turkey range in the low human population area considered turkey restocking to be unsuccessful, while respondents from the other two areas indicated that turkey restocking was successful (Table 12 D). The primary reason given for the failure of restocking was that released turkeys were not sufficiently wild.

Table 12. Game warden - game manager opinion of turkeys and methods used in restocking

A. Wildness of the released turkey							
Area	No. respondents reporting as						
	Sufficiently wild	Too tame					
I	13	6					
II	2	9					
III	2	5					

B. Need of further release			
Area	No. respondents reporting		
	Further releases needed	Not needed	Change methods
I	13	7	0
II	9	0	6
III	7	2	0

C. Release method preference of men using all types				
Area	Spring	No. respondents favoring		
		Fall	Holding pen	Direct release
I	12	0	7	5
II	2	1	3	3
III	0	1	4	1

D. Opinion of success of restocking							
Area	Success as		No. respondents reporting				
	Yes	No	Reasons not successful as				
			Insufficient brood stock	Turkeys tame	Lack food	Illegal kill	Predators
I	17	2	1	1	0	0	0
II	4	9	0	5	4	1	3
III	5	2	0	2	0	0	0

Propagation-Pen Evaluation

Data collected from propagation-pen operators are presented in Table 13.

Pen Site No. 1 data show that this pen was highly successful in turkey production. Known survival plus progeny produced and alive in September, 1953 represent 271.3 percent of the original brood stock.

Pen Site No. 2 data show that this pen was not too successful, probably as a result of improper predator control. Known survival plus progeny produced and alive in September, 1953 represent 69.6 percent of the original brood stock.

Pen Site No. 3 data show that this pen was almost a total failure as far as poult production was concerned, probably because of disease. The disease, blackhead (diagnosis given by W. B. Gross, DVM, on two poults from this pen), was probably carried into the pen by chicken droppings on the feet of the caretaker. Turkeys in this pen remained quite tame through rather constant association with man. Survival plus progeny produced and alive in September, 1953 represent 116.7 percent of the original stock. These turkeys were seen again in January with one less poult representing 100.0 percent survival plus progeny produced from the original stock.

Pen Site No. 4 was a complete failure considering known results. If any poults matured it is not known. They may have been lured out of the pen by a wild native hen which was seen adjacent to the pen with poults of two sizes.

Table 13. Known results obtained in four propagation-pens during the year, 1953

A. Known loss of propagation-pen brood stock

County location	Original stock		Dead on arrival	Dog	Killed by			Total	
					Fox	Autopsy	Unknown	No.	Percent
Alleghany	2M*	4F**	0	0	1(M)	0	0	1	16.7
Augusta	2M,	3F	0	0	0	2	3(2M)	5	100.0
Craig	3M,	20F	0	8	1	0	1(M)	10	43.5
Dickenson	2M,	20F	1	1	2	0	0	4	18.2
Total	9M,	47F	1	9	4(1M)	2	4(3M)	20	35.7

B. Predation and disease losses of nests, eggs, and poults

County location	Crow		Raccoon		Skunk		Fox		Poult loss by		
	Nests	Eggs	Nests	Eggs	Nests	Eggs	Nests	Eggs	Disease	Trap	Unknown
Alleghany	0	0	1	15	0	0	0	0	5	0	20
Augusta	0	0	0	0	0	0	0	0	0	0	12-20
Craig	3	12	0	0	2	10	1	4	0	0	1
Dickenson	0	0	0	0	0	0	0	0	0	1	0
Total	3	12	1	15	2	10	1	4	5	1	33-41

C. Poultry production

County location	Total		Desertion		Predation		Total hatch	Poults as of	
	Nests	Eggs	Nests	Eggs	Nests	Eggs		Sept., 1953	Jan., 1954
Alleghany	4	49	0	0	1	15	26	2	1
Augusta	3	25-33	1	13	0	0	12-20	0	0
Craig	11	48	0	0	10	37	7	6	0
Dickenson	7	85	2	23	0	0	40-50	40-50	6
Total	25	107-115	3	36	11	52	85-103	48-58	7

* Gobbler

** Hen

SUMMARY AND CONCLUSIONS

This evaluation of turkey restocking in western Virginia was conducted through: (1) compilation and study of restocking records, (2) survey of survival and reproduction of restocked turkeys, (3) comparison of success incurred using various release methods, (4) survey of warden and game manager opinion concerning possible factors influencing restocking success, and (5) study of data on propagation-pen success.

The area studied included occupied and unoccupied native turkey range west of the Blue Ridge and Patrick County, which lies partially within the southern end of the Blue Ridge Mountains in Virginia. The unoccupied range was divided on a basis of the number of occupied human habitations within a mile radius of release points. Areas of high and low human populations were differentiated. The area of low human population consists of extensive unbroken and relatively untravelled wilderness forest lands whereas the area of high human population consists of forest land that is well traversed by roads and people. Known survival data for the three divisions of the area studied are considered incomparable due to the difference in probability of observing turkeys.

A total of 11,077 game farm turkeys have been released in Virginia, of which 4,826 were released within the area studied. These attempts to restock wild turkeys cover the period from early spring, 1929 to June 30, 1953. There has been a reasonably low shipping loss, a low percentage of birds known living at farms, and a low known loss occurring following release.

The three divisions of the area studied have shown differences in known success of restocking but none presented very encouraging results. The greatest success known occurred within the unoccupied turkey range of high human population. This may be credited to a few individual releases which have shown good results within two or three years after the release date. This may be typical as it has been reported that after restocking with game farm raised turkeys the population increased with a subsequent rapid decline and stabilization of the population at a very low level.

In general, restocking methods such as spring or fall direct and small holding-pen releases of game farm turkeys were unsuccessful from a practical view-point. The propagation-pen system which has been used in Virginia only on an experimental basis has not been given a fair trial and may prove to be an exception to this statement. Twenty-four and a half years involving 4,771 turkeys released by a known method is considered by the writer to be more than a fair trial of the spring or fall direct and holding-pen releases.

Further study of data obtained, other than the total low rate of success, may present substantiating evidence that the turkey released is not adapted for direct or holding-pen releases because of its lack of wildness. A majority of respondents reporting turkey restocking as unsuccessful stated the reason as the turkeys were too tame.

Rather than a lack of wildness perhaps "predators other than dogs," "illegal kill," "lack of food," "weather conditions," "dogs," and "insufficient breeding stock" were the primary influences resulting in a low rate of success. It is believed by the writer that these

factors are secondary to a lack of wildness. How important would predation be if turkeys released were truly wild? Would "illegal kill" account for a large percentage if the turkeys released were truly wild? "Lack of food" is apparently a factor of prime importance which affects turkeys during late winter and early spring, yet truly wild turkeys are thriving on Northern ranges with less apparent food than on most areas restocked in Virginia. "Weather conditions" are probably very important periodically, but how often would they adversely affect a turkey population during a period of twenty-four and a half years? "Insufficient breeding stock" is a factor that unfortunately can be interpreted two ways. If interpreted to mean that numerically too few turkeys were released then in some areas this does not appear to be true. If the interpreted meaning of "insufficient breeding stock" was that the turkeys released were insufficient in their ability to survive and reproduce, then the writer will concur. It appears evident to the writer that the game farm raised turkey is not adapted for direct or delayed direct releases because of its acquired tameness through association with man.

RECOMMENDATIONS

Specific recommendations derived from data and personal observations of this writer are:

1. For economy, excess gobblers could be eliminated when they are day old poults.
2. Discontinue restocking of game farm raised wild turkeys using the direct and holding-pen releases except for the possible disposition of excess gobblers which should be released directly before hunting season in counties having an open turkey season.
3. Release turkeys using the propagation-pen method on unoccupied range only, to preclude any possibility of spreading disease.
4. Set aside areas for restocking with trapped wild turkeys only, to evaluate the success using this source of stock.
5. Annual or biennial census of turkeys on restocked areas.
6. Continue winter feeding on some areas to test its effect and possible use as a censusing device.
7. Examination of all available dead or sick turkeys by a qualified veterinarian.
8. Band all turkeys released.
9. Limited open hunting season within restocked areas when the population is sufficiently large. Weigh, sex, and age all turkeys taken.
10. Use all media of public information to keep public relations at a favorable level.

LITERATURE CITED

- Ambrosen, D. R. 1954. Personal correspondence to H. S. Mosby dated Feb. 26, 1954. Filed at the Va. Coop. Wildl. Res. Unit, Blacksburg, Va.
- Baldwin, W. P. 1954. An island population of turkeys. Unpub. Ms., Fish and Wildlife Service, Regional Office, Atlanta, Ga.
- Boyer, S. P. 1929?. The wild turkey. A survey. The Wild Turkey Conservation Association, 161 Fairfield Ave., Johnstown, Pa. 22 pp.
- Burget, M. L. 1947. Colorado wild turkey. Volume II. A publ. of Mgmt. Div. Fedl. Aid Sect., The Colo. Game and Fish Dept., Denver, Colo. 21 pp.
- Cantner, D. E. 1954. The status of turkey restocking in the United States. Unpub. Ms., Va. Coop. Wildl. Res. Unit, Blacksburg, Va.
- Coughlin, L. E. 1943. Wild turkeys on Laramie Peak. Wyoming Wildlife 8 (10), pp. 1-6. Cheyenne, Wyo.
- Frye, O. E. and E. B. Chamberlain. 1953. Memo. to Commissioners and Director of Fla. Game and Fresh Water Fish Comm., Unpub., 7 pp., Tallahassee, Fla.
- Gerstell, R. and W. H. Long. 1939. Physiological variations in wild turkeys and their significance in management. Pa. Game Comm. Res. Bul. 2, Harrisburg, Pa.
- Handley, C. O. 1938. Recent progress in wild turkey propagation in Virginia. 3'rd N. A. Wildl. Conf. Trans., pp. 847-851, Washington, D. C.
- Hoody, F. C. 1953. Personal correspondence to H. S. Mosby dated Oct. 29, 1953. Filed at the Va. Coop. Wildl. Res. Unit, Blacksburg, Va.
- Kozicky, E. L. 1948. Life history and management of the wild turkey (Meleagris gallopavo silvestris) Ph.D. Dissertation, Pa. State College, State College, Pa.
- Latham, R. M. 1941. The history of the wild turkey in Pennsylvania. Pa. Game News, 12 (9) pp. 6-7, 32, Harrisburg, Pa.
- Leopold, A. S. 1944. The nature of heritable wildness in turkeys. The Condor, 46 (4) pp. 133-197.

- Ligon, J. S. 1946. History and management of Merriam's wild turkey. N. Mex. Game and Fish Comm., 84 pp., Santa Fe, N. Mex.
- McDowell, R. D. 1953. Unpub. field notes filed at the Va. Coop. Wildl. Res. Unit, Blacksburg, Va.
- Moody, R. D. and J. O. Collins. 1953. Annual progress report, Louisiana, July, 1952 - July, 1953. P. R. Project 24R3. La. Dept. of Wildl. and Fisheries, New Orleans, La. 54 pp.
- Mosby, H. S. 1936. Unpub. field notes, Filed at the Va. Coop. Wildl. Res. Unit, Blacksburg, Va.
- Mosby, H. S. 1938. Unpub. field notes filed at the Va. Coop. Wildl. Res. Unit, Blacksburg, Va.
- Mosby, H. S. and C. O. Handley, 1943. The wild turkey in Virginia: its status, life history and management. Div. of Game, Comm. of Game and Inland Fisheries, Richmond, Va. 281 pp.
- S. D. Cons. Digest. 1954. Wild turkeys trapped and transplanted. South Dakota Conservation Digest, 21 (2), pp. 2-3, 16, Pierre, S. D.
- Stanberry, F. W. and L. Gainey. 1953. Peace river turkey restoration. Fla. Wildl. 7 (5) pp. 32-33, 39.
- Snyder, R. L. and H. A. Roberts. 1953. Pennsylvania's wild turkey range, past and present. Pa. Game News, 24 (8), pp. 4-7, Harrisburg, Pa.
- Texas. 1945. Principal game birds and mammals of Texas. Texas Game, Fish and Oyster Comm., 149 pp.
- Womble, H. M. 1954. Personal correspondence to H. S. Mosby dated March 5, 1954, Filed at the Va. Coop. Wildl. Res. Unit, Blacksburg, Va.

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Appendix Table 1A. Restocking release records of game farm turkeys
in Virginia from the spring of 1929 to 1933

County	1929	1929-1930		1930-1931		1931-1932		1932-1933	
	S*	F**	S	F	S	F	S	F	S
Accomack	-	-	-	7	-	-	-	-	-
Albermarle	8	-	14	-	2	-	-	-	-
Alleghany	-	-	-	27	-	22	-	-	-
Amelia	-	-	11	4	-	6	-	4	3
Amherst	8	-	-	-	-	-	-	-	-
Appomattox	-	-	-	-	-	-	-	2	-
Arlington	-	-	-	-	-	-	-	-	-
Augusta	8	-	2	24	-	8	-	-	-
Bath	-	-	6	2	-	-	-	-	-
Bedford	8	-	-	-	-	-	-	-	-
Bland	-	-	-	-	-	50	-	-	-
Botetourt	8	-	-	-	-	2	-	-	-
Brunswick	-	-	-	-	-	-	-	-	-
Buchanan	-	-	-	-	-	6	-	-	-
Buckingham	-	-	-	-	-	11	-	-	9
Campbell	-	-	-	-	-	-	-	-	-
Caroline	-	-	-	-	-	-	-	-	-
Carroll	-	-	-	7	-	-	-	-	-
Charles City	-	-	-	12	-	-	-	2	-
Charlotte	-	-	-	-	-	-	-	-	-
Chesterfield	-	-	-	-	-	-	-	-	-
Clarke	-	-	-	-	-	-	-	-	-
Craig	-	-	-	-	-	-	-	-	-
Culpepper	-	-	-	-	4	-	-	-	-
Cumberland	-	-	-	-	3	-	-	-	-
Dickenson	-	-	-	-	-	34	-	-	-
Dinwiddie	-	-	-	-	-	-	-	-	-
Elizabeth City	-	-	-	-	-	-	-	-	-
Essex	-	-	-	-	-	-	-	-	-
Fairfax	-	-	-	-	-	-	-	-	-
Feuquier	-	-	-	-	-	-	-	-	-
Floyd	-	-	-	25	-	-	-	-	-
Fluvanna	-	-	-	-	-	-	-	-	-
Franklin	8	-	-	24	-	15	-	-	2
Frederick	-	-	-	-	-	-	-	-	-
Giles	8	-	6	24	-	-	-	-	-
Gloucester	-	-	-	-	-	-	-	-	-
Goochland	-	-	-	-	-	4	-	-	-
Grayson	-	-	-	-	-	-	-	-	-
Greene	-	-	-	-	-	-	-	-	-
Greensville	-	-	-	-	-	-	-	-	-
Halifax	-	-	-	-	-	-	-	7	-
Hanover	-	-	-	-	-	-	-	-	-

* Spring release

** Fall release

Appendix Table 1A. Restocking release records of game farm turkeys
in Virginia from the spring of 1929 to 1933
(continued)

County	1929	1929-1930		1930-1931		1931-1932		1932-1933	
	S	F	S	F	S	F	S	F	S
Henrico	-	-	-	-	-	1	-	2	-
Henry	8	-	8	-	-	-	-	-	-
Highland	-	-	-	-	-	-	-	-	-
Isle of Wight	-	-	-	-	-	-	-	-	-
James City	-	-	9	12	-	6	-	12	7
King George	-	-	-	-	-	-	-	-	-
King and Queen	-	-	-	-	-	-	-	-	-
King William	-	-	-	-	-	-	-	-	-
Lancaster	8	-	-	-	-	-	-	-	-
Lee	8	-	-	-	-	-	-	-	-
Loudoun	-	-	-	-	6	-	-	10	-
Louisa	-	-	1	-	-	-	-	-	-
Lunenburg	-	-	-	-	-	-	-	-	-
Madison	-	-	-	5	-	-	-	-	-
Mathews	-	-	-	-	-	-	-	-	-
Mecklenburg	-	-	-	-	-	-	-	-	-
Middlesex	-	-	-	-	-	-	-	-	-
Montgomery	-	-	-	-	-	-	-	-	-
Nasemond	-	-	-	-	-	-	-	1	-
Nelson	-	-	-	3	-	4	-	-	-
New Kent	6	-	-	4	-	13	-	-	-
Norfolk	-	-	1	-	-	-	-	-	-
Northampton	-	-	2	-	1	-	-	-	-
Northumberland	8	-	5	-	1	-	-	-	-
Nottoway	-	-	-	-	-	-	-	-	-
Orange	-	-	-	-	-	-	-	-	-
Page	-	-	-	-	-	-	-	-	-
Patrick	-	-	-	-	-	-	-	-	-
Pittsylvania	-	-	-	-	-	-	-	3	-
Powhatan	-	-	-	10	1	-	-	-	-
Prince Edward	-	-	-	-	1	-	-	-	-
Prince George	-	-	-	-	6	-	-	-	-
Princess Ann	-	-	-	-	-	-	-	3	-
Prince William	-	-	-	-	-	-	-	-	-
Pulaski	8	-	-	-	-	-	-	-	-
Rappahannock	-	-	-	-	-	-	-	-	-
Richmond	8	-	-	-	-	-	-	-	-
Roanoke	8	-	-	50	-	-	-	-	-
Rockbridge	-	-	4	-	-	25	-	-	-
Rockingham	-	-	10	-	-	22	-	-	-
Russell	8	-	-	-	-	-	-	-	-
Scott	8	-	-	-	-	25	-	-	-
Shenandoah	-	-	-	-	16	37	-	-	-

Appendix Table 1A. Restocking release records of game farm turkeys
in Virginia from the spring of 1929 to 1933
(continued)

County	1929	1929-1930		1930-1931		1931-1932		1932-1933	
	S	F	S	F	S	F	S	F	S
Smyth	8	-	11	-	-	-	-	-	-
Southampton	-	-	-	-	-	-	-	-	-
Spotsylvania	-	-	-	-	-	8	-	-	-
Stafford	-	-	-	-	-	-	-	-	-
Surry	-	-	-	-	-	-	-	-	-
Sussex	-	-	-	-	-	-	-	-	-
Tazewell	-	-	-	-	-	-	-	-	-
Warren	-	-	-	25	-	-	-	-	-
Warwick	-	-	-	-	-	-	-	6	-
Washington	8	-	-	-	-	-	-	-	-
Westmoreland	-	-	-	3	-	-	-	-	-
Wise	-	-	-	25	-	15	-	-	-
Wythe	-	-	-	-	-	-	-	-	-
York	-	-	-	-	-	-	-	-	-
Richmond City	-	-	-	-	-	-	-	-	-
Yearly Totals	150	-	90	293	41	314	0	52	21

Appendix Table 1B. Restocking release records of wild turkeys in Virginia from the spring of 1933 to 1938

County	1933-1934		1934-1935		1935-1936		1936-1937	1937-1938
	F	S	F	S	F	S	Unknown*	Unknown*
Accomack	-	-	-	-	-	-	-	-
Albermarle	-	-	-	-	7	4	15	8
Alleghany	10	-	-	-	7	-	-	10
Amelia	15	-	14	7	10	-	17	46
Amherst	5	-	-	-	-	-	-	2
Appomattox	-	-	-	-	-	-	-	-
Arlington	-	-	-	-	-	-	-	-
Augusta	1	-	-	-	-	-	111	43
Bath	-	-	-	-	-	-	24	1
Bedford	3	3	3	2	4	-	4	7
Bland	3	1	-	-	-	-	-	-
Botetourt	-	-	-	-	4	2	6	-
Brunswick	-	1	-	-	-	-	-	-
Buchanan	-	-	-	-	-	-	-	-
Buckingham	9	3	-	-	6	2	30	5
Campbell	-	-	-	-	-	-	-	-
Caroline	-	-	2	-	-	-	-	3
Carroll	1	-	-	-	-	-	-	-
Charles City	7	-	1	-	3	-	40	-
Charlotte	-	-	-	-	4	-	-	-
Chesterfield	-	-	4	-	2	-	4	-
Clarke	-	-	-	-	2	-	2	-
Craig	-	-	-	-	5	-	6	-
Culpepper	-	-	-	-	2	2	3	4
Cumberland	-	-	-	-	3	-	-	4
Dickenson	-	-	8	-	-	-	-	-
Dinwiddie	-	-	-	-	-	-	-	10
Elizabeth City	-	-	-	-	-	-	-	-
Essex	-	-	-	-	3	-	6	-
Fairfax	-	-	-	-	-	-	7	6
Fauquier	6	1	-	-	-	-	6	2
Floyd	-	-	-	-	-	-	-	-
Fluvanna	-	-	-	-	-	-	8	4
Franklin	10	-	-	-	-	-	10	-
Frederick	-	-	-	-	-	-	-	-
Giles	-	-	-	-	-	-	-	-
Gloucester	-	-	-	-	-	-	-	4
Goochland	-	-	-	-	-	-	5	7
Grayson	-	-	-	-	-	-	-	-
Greene	-	-	-	-	-	-	-	-
Greensville	-	-	-	-	-	-	-	-
Halifax	1	-	-	-	4	-	-	-
Hanover	3	3	-	-	-	-	6	1
Henrico	-	-	-	1	-	-	-	-

* Release date unknown during the fiscal year

Appendix Table 1B. Restocking release records of wild turkeys in Virginia from the spring of 1933 to 1938 (continued)

County	1933-1934		1934-1935		1935-1936		1936-1937	1937-1938
	F	S	F	S	F	S	Unknown	Unknown
Spotsylvania	-	-	-	-	-	-	3	-
Stafford	-	1	4	-	5	-	-	-
Surry	-	-	-	4	-	-	-	-
Sussex	-	-	-	-	-	-	-	-
Tazewell	-	-	-	-	-	-	-	-
Warren	-	-	-	-	-	-	-	-
Warwick	1	-	-	-	-	1	-	-
Washington	-	-	-	-	-	-	15	-
Westmoreland	-	-	3	-	-	-	6	-
Wise	-	-	-	-	20	-	-	-
Wythe	-	-	-	-	-	-	-	-
York	-	1	2	-	-	-	-	-
Richmond City	-	-	-	-	-	-	3	-
Yearly Totals	114	28	77	14	127	30	460	224

Appendix Table 1C. Restocking release records of wild turkeys in Virginia from 1938 to 1943

County	1938-1939 Unknown*	1939-1940 Unknown	1940-1941 Unknown	1941-1942 Unknown	1942-1943 Unknown
Accomack	-	-	-	-	-
Albermarle	5	6	2	-	-
Alleghany	9	5	8	-	-
Amelia	-	20	9	6	3
Amherst	-	6	-	-	-
Appomattox	-	-	-	-	-
Arlington	-	-	-	-	-
Augusta	-	-	-	-	-
Bath	-	8	-	-	-
Bedford	2	5	-	-	-
Bland	-	-	8	-	-
Botetourt	-	-	-	-	-
Brunswick	-	3	-	-	-
Buchanan	-	-	2	-	-
Buckingham	11	12	27	5	-
Campbell	-	-	-	-	-
Caroline	-	-	-	2	-
Carroll	-	-	-	-	-
Charles City	-	2	-	-	-
Charlotte	8	-	-	-	-
Chesterfield	6	8	9	4	2
Clarke	-	3	-	-	-
Craig	-	-	-	-	-
Culpepper	6	9	-	-	-
Cumberland	-	1	20	1	-
Dickenson	2	-	2	-	-
Dinwiddie	-	1	-	-	-
Elizabeth City	-	-	-	-	-
Essex	1	-	3	-	-
Fairfax	4	10	8	-	-
Fauquier	3	5	-	-	-
Floyd	-	-	-	-	-
Fluvanna	4	7	4	-	-
Franklin	-	-	-	-	-
Frederick	-	-	-	-	-
Giles	6	-	8	-	-
Gloucester	-	2	-	-	-
Goochland	-	-	-	-	-
Grayson	-	-	6	10	-
Greene	-	7	6	-	-
Greensville	1	-	-	-	-
Halifax	4	3	141	-	-
Hanover	4	5	1	-	-
Henrico	-	-	-	-	-

* Release date unknown during the fiscal year

Appendix Table 1C. Restocking release records of wild turkeys in Virginia from 1938 to 1943 (continued)

County	1938-1939 Unknown	1939-1940 Unknown	1940-1941 Unknown	1941-1942 Unknown	1942-1943 Unknown
Henry	-	-	-	-	-
Highland	-	-	-	-	-
Isle of Wight	-	-	-	-	-
James City	-	-	-	5	3
King George	2	-	3	-	-
King and Queen	-	-	-	-	-
King William	2	-	-	-	-
Lancaster	-	-	-	-	-
Lee	-	-	-	-	-
Loudoun	-	-	-	-	-
Louisa	2	-	2	1	-
Lunenburg	3	4	-	-	-
Madison	2	7	8	-	-
Mathews	-	-	-	-	-
Mecklenburg	6	7	2	-	-
Middlesex	-	5	3	5	-
Montgomery	-	-	-	-	-
Nasemond	3	-	-	-	-
Nelson	-	6	-	-	-
New Kent	-	-	-	12	-
Norfolk	-	-	-	-	-
Northampton	-	-	-	-	-
Northumberland	-	-	-	-	-
Nottoway	3	5	12	-	3
Orange	-	-	-	-	-
Page	2	-	-	-	-
Patrick	-	-	7	-	-
Pittsylvania	6	1	-	11	-
Powhatan	-	-	4	-	-
Prince Edward	-	-	10	10	-
Prince George	3	5	-	-	-
Princess Ann	-	-	-	-	-
Prince William	-	-	8	-	-
Pulaski	-	-	-	-	-
Rappahannock	-	10	20	-	-
Richmond	-	-	-	-	-
Roanoke	-	-	-	-	-
Rockbridge	-	-	-	-	-
Rockingham	-	-	15	-	-
Russell	-	-	-	-	-
Scott	-	-	-	-	-
Shenandoah	-	6	-	-	-
Smyth	6	-	4	4	-
Southampton	4	-	-	-	-

Appendix Table 1C. Restocking release records of wild turkeys in Virginia from 1938 to 1943 (continued)

County	1938-1939 Unknown	1939-1940 Unknown	1940-1941 Unknown	1941-1948 Unknown	1948-1943 Unknown
Spotsylvania	2	-	2	-	-
Stafford	2	-	6	-	-
Surry	4	-	-	-	-
Sussex	-	-	-	-	-
Tazewell	-	-	6	10	-
Warren	2	-	-	-	-
Warwick	-	-	25	4	-
Washington	-	-	2	4	-
Westmoreland	-	-	-	-	-
Wise	-	-	2	-	-
Wythe	-	-	6	10	-
York	-	-	-	-	-
Richmond City	-	-	-	-	-
Yearly Totals	130	184	411	104	11

Appendix Table 1D. Restocking release records of wild turkeys in Virginia from 1943 to 1948

County	1943-1944 Unknown*	1944-1945 Unknown	1945-1946 Unknown	1946-1947 Unknown	1947-1948 Unknown
Accomack	-	-	-	-	3
Albermarle	-	-	-	-	-
Alleghany	-	-	-	-	-
Amelia	7	7	4	4	8
Amherst	-	-	-	-	2
Appomattox	-	-	-	-	-
Arlington	-	-	-	-	-
Augusta	-	-	-	-	-
Bath	-	-	-	-	-
Bedford	-	-	-	-	-
Bland	-	-	-	-	-
Botetourt	-	-	-	-	-
Brunswick	-	-	-	-	-
Buchanan	-	-	-	-	-
Buckingham	-	2	-	1	5
Campbell	-	-	-	-	-
Caroline	2	-	-	-	-
Carroll	-	-	-	-	-
Charles City	-	3	-	-	-
Charlotte	-	-	-	-	-
Chesterfield	-	-	2	-	2
Clarke	-	-	-	-	-
Craig	-	-	-	-	-
Culpepper	-	-	-	-	-
Cumberland	-	-	-	-	-
Dickenson	-	-	-	-	-
Dinwiddie	3	2	-	-	-
Elizabeth City	-	-	-	-	-
Essex	-	-	-	30	-
Fairfax	-	-	-	-	-
Fauquier	-	-	-	-	-
Floyd	-	-	-	-	-
Fluvanna	-	2	-	-	-
Franklin	-	-	-	-	-
Frederick	-	-	-	-	-
Giles	-	-	-	1	30
Gloucester	-	-	-	-	-
Goochland	-	-	-	-	-
Grayson	-	-	-	-	-
Greene	-	-	-	-	-
Greensville	-	-	-	-	10
Halifax	-	-	2	1	-
Hanover	-	-	-	-	-
Henrico	-	-	-	-	-

* Release date unknown during the fiscal year

Appendix Table 1D. Restocking release records of wild turkeys in Virginia from 1943 to 1948 (continued)

County	1943-1944 Unknown	1944-1945 Unknown	1945-1946 Unknown	1946-1947 Unknown	1947-1948 Unknown
Henry	-	-	-	-	2
Highland	-	-	-	-	-
Isle of Wight	-	-	-	-	-
James City	-	-	-	-	-
King George	-	-	-	-	-
King and Queen	-	-	-	-	-
King William	-	-	-	-	-
Lancaster	-	20	-	20	-
Lee	-	-	-	-	-
Loudoun	-	-	-	-	-
Louisa	-	-	2	-	2
Lunenburg	-	-	-	-	-
Madison	-	-	-	-	-
Mathews	-	-	-	-	-
Mecklenburg	2	4	-	-	-
Middlesex	-	-	-	-	-
Montgomery	-	-	-	-	-
Nasemond	-	-	-	-	-
Nelson	-	-	2	-	-
New Kent	-	-	-	-	-
Norfolk	-	-	-	-	-
Northampton	-	-	-	-	-
Northumberland	-	20	-	-	3
Nottoway	-	-	-	-	2
Orange	-	-	-	-	3
Page	-	-	-	-	-
Patrick	-	-	-	-	-
Pittsylvania	-	-	-	-	-
Powhatan	-	5	-	-	-
Prince Edward	-	-	-	-	-
Prince George	-	2	-	-	-
Princess Ann	-	-	-	-	-
Prince William	-	-	-	-	-
Pulaski	-	-	-	-	-
Rappahannock	-	-	-	-	-
Richmond	-	20	-	20	-
Roanoke	-	-	-	-	-
Rockbridge	-	-	-	-	-
Rockingham	-	-	-	-	3
Russell	-	-	-	-	-
Scott	-	-	-	-	-
Shenandoah	-	-	-	-	-
Smyth	-	-	-	-	-
Southampton	-	-	-	-	-

Appendix Table 1D. Restocking release records of wild turkeys in Virginia from 1943 to 1948 (continued)

County	1943-1944 Unknown	1944-1945 Unknown	1945-1946 Unknown	1946-1947 Unknown	1947-1948 Unknown
Spotsylvania	-	-	-	-	-
Stafford	-	-	-	-	-
Surry	-	-	-	-	-
Sussex	-	-	-	-	-
Tazewell	-	-	-	-	54
Warren	-	-	-	-	-
Warwick	-	-	-	-	-
Washington	-	-	-	-	-
Westmoreland	-	20	-	20	-
Wise	-	-	-	-	-
Wythe	-	-	-	-	-
York	-	-	-	-	-
Richmond City	-	-	-	-	-
Yearly Totals	14	107	12	97	129

Appendix Table 1E. Restocking release records of wild turkeys in Virginia from 1948 to July, 1951 (continued)

County	1948-1949			1949-1950			1950-1951		
	F	S	Unkn	F	S	Unkn	F	S	Unkn
Henry	-	-	2	-	-	2	72	14	-
Highland	-	-	-	-	-	-	-	-	-
Isle of Wight	-	-	-	-	-	-	-	-	-
James City	-	-	6	-	-	-	-	-	-
King George	-	-	-	-	-	-	-	-	-
King and Queen	-	-	-	-	-	-	-	-	-
King William	-	-	-	-	-	-	-	-	-
Lancaster	-	-	3	-	-	9	38	-	-
Lee	-	-	-	-	-	-	-	-	-
Loudoun	-	-	-	-	-	-	-	-	-
Louisa	-	-	4	-	-	-	-	3	-
Lunenburg	-	-	-	-	-	-	-	26	-
Madison	-	-	25	-	-	80	68	-	-
Mathews	-	-	-	-	-	-	-	11	-
Mecklenburg	-	-	-	-	-	-	-	23	-
Middlesex	-	-	-	-	-	-	-	-	-
Montgomery	-	-	-	-	-	-	-	-	-
Nasemond	-	-	-	-	-	3	-	5	-
Nelson	-	-	-	-	-	-	-	-	-
New Kent	-	-	4	-	-	-	-	-	-
Norfolk	-	-	-	-	-	-	-	-	-
Northampton	-	-	-	-	-	-	-	-	-
Northumberland	-	-	-	-	-	-	-	13	-
Nottoway	-	-	-	-	-	2	-	19	-
Orange	-	-	-	-	-	-	-	7	-
Page	-	-	-	-	-	-	-	-	-
Patrick	100	-	-	80	-	-	71	24	-
Pittsylvania	-	-	-	-	-	3	-	30	-
Powhatan	-	-	-	-	-	-	-	10	-
Prince Edward	-	-	-	-	-	-	-	-	-
Prince George	-	-	-	-	-	-	-	5	-
Princess Ann	-	-	-	-	-	-	-	-	-
Prince William	-	-	-	-	-	-	-	16	-
Pulaski	-	-	-	-	-	-	-	-	-
Rappahannock	-	-	20	-	-	80	70	-	-
Richmond	-	-	-	-	-	10	40	-	-
Roanoke	-	-	-	-	-	-	-	-	-
Rockbridge	-	-	-	-	-	-	-	-	-
Rockingham	-	-	-	-	-	-	-	-	-
Russell	-	-	-	-	-	-	-	-	-
Scott	58	-	-	85	-	-	72	-	-
Shenandoah	2	-	-	-	-	-	-	-	-
Smyth	96	20	-	70	-	-	72	-	-
Southampton	-	-	18	-	-	-	-	5	-

Appendix Table 1E. Restocking release records of wild turkeys in Virginia from 1948 to July, 1951 (continued)

County	1948-1949			1949-1950			1950-1951		
	F	S	Unkn	F	S	Unkn	F	S	Unkn
Spotsylvania	-	-	12	-	-	6	-	4	-
Stafford	-	-	-	-	-	-	-	-	-
Surry	-	-	-	-	-	-	-	6	-
Sussex	-	-	-	-	-	7	-	9	-
Tazewell	-	-	-	-	-	-	-	-	-
Warren	-	-	-	-	-	-	-	-	-
Warwick	-	-	-	-	-	-	-	3	-
Washington	96	-	-	59	-	-	71	-	-
Westmoreland	-	-	3	-	-	10	35	13	-
Wise	-	-	-	-	-	-	-	-	-
Wythe	-	-	-	-	-	-	-	-	-
York	-	-	-	-	-	-	-	-	-
Richmond City	-	-	-	-	-	-	-	-	-
Totals	494	28	208	429	32	427	1120	510	0

Appendix Table 1F. Restocking release records of wild turkeys in Virginia from 1951 to July, 1953

County	1951-1952		1952-1953		County Total (1929-1953)
	F	S	F	S	
Accomack	-	-	-	-	10
Albermarle	-	12	10	37	140
Alleghany	-	22	20	19*	205
Amelia	-	16	-	19	281
Amherst	-	-	20	17	65
Appomattox	-	20	-	11	62
Arlington	-	-	-	-	0
Augusta	-	10	45	17**	269
Bath	-	-	20	10	71
Bedford	-	-	19	-	77
Bland	-	-	57	-	344
Botetourt	-	-	-	-	22
Brunswick	-	10	10	-	40
Buchanan	-	-	50	-	58
Buckingham	-	3	20	-	191
Campbell	-	4	39	24	79
Caroline	-	21	-	22	77
Carroll	-	-	100	-	108
Charles City	-	-	22	4	96
Charlotte	15	30	15	6	93
Chesterfield	-	-	60	57	182
Clarke	13	-	20	29	69
Craig	48	20	47	22***	195
Culpepper	-	15	-	10	55
Cumberland	-	-	12	18	65
Dickenson	72	-	105	21****	437
Dinwiddie	-	-	10	-	33
Elizabeth City	-	-	-	-	0
Essex	-	6	-	-	49
Fairfax	25	-	30	17	125
Fauquier	2	6	4	17	74
Floyd	-	-	-	-	66
Fluvanna	-	20	12	8	78
Franklin	97	-	45	-	469
Frederick	-	-	-	30	30
Giles	72	-	95	-	311
Gloucester	44	-	19	-	79
Goochland	-	14	10	-	43
Grayson	-	38	30	-	84
Greene	50	-	88	-	323
Greensville	-	-	-	14	39
Halifax	-	10	-	10	192
Hanover	-	20	-	15	116
Henrico	-	-	-	-	4

* 6 birds used in propagation pens

** 5 birds used in propagation pens

*** 22 birds used in propagation pens

**** 21 birds used in propagation pens

Appendix Table 1F. Restocking release records of wild turkeys in Virginia from 1951 to July, 1953 (continued)

County	1951-1952		1952-1953		County Total (1929-1953)
	F	S	F	S	
Henry	75	2	70	-	274
Highland	-	-	27	12	59
Isle of Wight	-	10	10	-	20
James City	-	3	20	-	114
King George	-	-	7	-	13
King and Queen	-	-	8	-	8
King William	-	4	8	7	27
Lancaster	41	-	-	-	139
Lee	-	-	-	-	8
Loudoun	-	-	-	-	29
Louisa	-	-	-	10	31
Lunenburg	-	4	-	-	37
Madison	49	-	87	-	331
Mathews	43	-	20	-	74
Mecklenburg	-	19	-	15	101
Middlesex	-	-	22	-	39
Montgomery	-	-	-	-	0
Nasamond	-	8	10	-	30
Nelson	-	-	5	-	37
New Kent	-	-	-	44	133
Norfolk	-	7	72	-	80
Northampton	-	-	-	-	3
Northumberland	42	-	38	-	130
Nottoway	-	20	-	8	74
Orange	-	-	-	-	13
Page	-	10	10	25	52
Patrick	44	20	115	39	530
Pittsylvania	-	20	20	31	151
Powhatan	-	32	8	26	98
Prince Edward	-	-	-	-	30
Prince George	-	5	-	-	26
Princess Ann	-	-	-	-	5
Prince William	-	12	40	33	123
Pulaski	72	12	97	-	189
Rappahannock	48	-	88	-	349
Richmond	44	-	40	-	182
Roanoke	-	-	-	-	61
Rockbridge	-	-	10	-	51
Rockingham	-	-	-	19	77
Russell	-	-	-	-	8
Scott	72	-	105	-	425
Shenandoah	-	-	12	20	121
Smyth	71	-	36	-	401
Southampton	-	-	10	-	37

Appendix Table 1F. Restocking release records of wild turkeys in Virginia from 1951 to July, 1953 (continued)

County	1951-1952		1952-1953		County Total (1929-1953)
	F	S	F	S	
Spotsylvania	-	9	-	8	54
Stafford	-	10	8	-	36
Surry	-	-	11	-	25
Sussex	-	-	-	-	16
Tazewell	-	-	-	-	70
Warren	-	10	-	25	62
Warwick	-	-	-	-	40
Washington	72	-	58	-	385
Westmoreland	42	-	46	-	201
Wise	-	-	-	-	62
Wythe	-	-	-	-	16
York	-	-	-	-	3
Richmond City	-	-	-	-	3
Totals	1153	514	2152	776	11077

Appendix Table 2. Game warden - game manager opinion survey questionnaire

Area _____ Warden _____ Game Manager _____ Technician _____

1. How long have you been assigned to this county as a game warden?
 _____ years

2. How long have you lived in this county? _____ years

3. What do you think are the main limiting factors of turkey production in your county? (Number in order 1, 2, 3.) (Read list before getting answer.)

- | | | |
|--------------------|--------------------|-----------------------------------|
| _____ Burning | _____ Wet weather | _____ Predators other than dogs |
| _____ Lumbering | _____ Illegal kill | _____ Mowing |
| _____ Lack of food | _____ Dogs | _____ Insufficient breeding stock |

4. Are there any areas in your county that at present have no turkeys and could sustain a population if restocked? ___ Yes ___ No ___ Unknown

If yes, where? _____

5. Do you have turkey hunters living in your county? ___ Yes ___ No

_____ Number Remarks on age _____

6. Are hunters interested more in increasing turkeys than other game?
 ___ Yes ___ No

If no, what game species are they primarily interested in? _____

7. Have you ever released wild turkeys in this county while employed as warden? ___ Yes ___ No Have your predecessors? ___ Yes ___ No



8. Were there any wild turkeys in this county prior to the initiation of the stocking program in this county? ___ Yes ___ No ___ Unknown (Year commenced stocking _____)

If yes, where? _____

8. (Cont.) If no, when were they last reported in this county?
 ____ Year ____ Unknown
 Where? _____
9. Have you stocked turkeys on range already occupied by native stock?
 ____ Yes ____ No ____ N.A.
 Have your predecessors? ____ Yes ____ No ____ N.A.
10. Do any of the areas you stocked in this county have a reproducing turkey population? ____ Yes ____ No ____ N.A. Where (if yes) _____

 If yes, is this the result of: ____ Restocking, ____ Native birds, ____ Unknown
 Do any of the areas your predecessor stocked have a reproducing turkey population? ____ Yes ____ No ____ N.A.; Where _____

 If yes, is this the result of: ____ Restocking, ____ Native birds, ____ Unknown
11. Do residents know where you release turkeys in your county?
 ____ Yes ____ No ____ Little
12. What do residents think about the restocking program? ____ Unknown by warden

 Has there been a change in opinion? ____ Yes ____ No How? _____
13. Do residents kill or protect released birds in the county?
 ____ Kill ____ Protect ____ Both
 ____ slightly ____ slightly
 ____ extensively ____ extensively
- Has there been a change in the degree of killing or protecting since initiation of the restocking program? ____ Yes ____ No How, if yes?

14. Have any of the birds restocked by you lived to produce a brood the following spring? ____ Yes ____ No ____ Unknown Where? _____

14. (cont.) If yes, did the young reach maturity? Yes No Unknown

15. Have you had any sick birds furnished to you by the Commission?
 Yes No Unknown

If yes, did you release them? Yes No What was wrong with them? Unknown

Disease remarks _____

16. Have you ever received any dead birds from the Commission?
 Yes No Number

Cause of death _____

17. Do the restocked birds act tame and go to farm houses? Yes No
 Unknown

If yes, what percent? _____

18. Do you think turkey restocking has been successful in your county?
 Yes No

If no, why? _____

19. Do you think a spring release is better than a fall release?
 Yes No Unknown

20. Do you think a holding pen release is better than a direct release?
 Yes No Unknown

21. Check releases used by you:

holding pen, direct release, spring

holding pen, direct release, fall

22. Have you any need for further release of turkeys in this county?
 Yes No Unknown

23. What do you think of stocking game farm turkeys? _____

24. What suggestions do you have for improving turkey restocking?
