mudfish *(Amia calva)*, both of which are abundant in the canals of southern Florida. McIlhenny (1934) found a total of 22 gar in the 24 specimens examined from Avery Island and Kellogg (1929) counted one gar and one mudfish in his work on food habit. Giles and Childs (1949) found five mudfish but no gar. We attribute their absence in our study to the small size of the alligators examined.

Fish were the only vertebrates observed in our examinations accounting for only 1.1 percent of the total food volume. They can be considered of minor importance when compared to the 98.0 percent total volume of invertebrates.

Insecta. Insects from four Orders (Hemiptera, Odonata, Coleptera, and Orthoptera) were found. Of the 25 insects found, 20 were the giant water bug *(Belostoma griseus)*. One alligator contained nine belostomids. The total volume percentage of insects observed amounted to only 0.3 percent. The smallest alligator we examined was 29 in (83.7 cm) long and it contained one giant water bug. Insects could be more important as food for smaller alligators.

Debris. Although stones, roots, pieces of wood, and other hard objects could hardly be considered food, no less than 224 such articles were found in the stomachs we examined. They accounted for 0.9 percent by volume of the total contents.

LITERATURE CITED

Chabreck, R. H. 1963. Methods of capturing, marking, and sexing alligators. Proc. Annu. Conf. S.E. Assoc. Game and Fish Comm. 17:47-50.

Chamberlain, E. B. 1930. Notes on the stomach contents of an alligator. Copeia 3:83-84.

Clench, W. J. and R. D. Turner. 1956. Freshwater mollusks of Alabama, Georgia, and Florida from the Escambia to the Suwannee River. Bull. Fla. State Mus., 1(3):120-122.

Ditmars, R. L. 1936. The reptiles of North America. Doubleday and Co., Inc., New York. 476 p.

Giles, L. W. and V. L. Childs. 1949. Alligator management of the Sabine National Wildlife Refuge. J. Wildl. Mgmt. 13(1):16-28.

Kellogg, A. R. 1929. The habits and economic importance of alligators. U. S. Dept. Agr., Tech. Bull. 147. p. 21-33.

McIlhenny, E. A. 1934. Notes on alligators. Copeia 2:85-86.

REEVE'S PHEASANT INVESTIGATIONS IN KENTUCKY[1]

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ABSTRACT

Establishment was not attained during a six-year intensive investigation into the factors influencing survival of liberated pen-reared Reeve's pheasants in Kentucky.

During the tenure of the study, 6,815 juvenile and 859 adult Reeve's were liberated in a variety of habitat composition at seven pre-selected release areas. The sex ratio of release stock was 93 cocks per 100 hens. To enhance field identification, all liberated pheasants were marked with plastic neck tags and metal leg bands.

The total recorded mortality was less than two percent of the number released. Approximately thirty percent of the known fatalities was attributed to predation. Avian and fox predation accounted for most of predatory fatalities.

[1] A Contribution of Kentucky Federal Aid Project W-38-R

Ten broods averaging almost ten chicks per brood were reported. Some evidence was found to indicate a "drumming" display by adult male Reeve's may be associated with reproduction.

A total of 2,308 post-release observations was recorded during 3,117 man-hours of field time expended. These observations occurred in numerous habitat types with various species compositions, but mixed stands of hardwood interspersed with mixed herbaceous plants appeared to be most generally preferred. The sex ratio of field observations was 167 cocks per 100 hens.

Known movements of Reeve's did not exceed twelve miles. Scattered grain and the use of feeders at three areas appeared to retard dispersal.

Food utilization studies revealed that food habits of Reeve's pheasants were similar to those of native ruffed grouse but no detrimental effects to grouse or to other native game populations were discovered.

This species demonstrated an ability to cope with severe weather conditions.

Excessive mortality, though not demonstrated by this study, and limited reproduction were probably the most important factors affecting survival of this species in Kentucky.

Future liberations of this pheasant in Kentucky is not recommended.

ACKNOWLEDGMENTS

The writer is particularly indebted to Chief Research Biologist Lee K. Nelson for his assistance and direction in the various aspects of the study. Appreciation is extended to Commissioner Minor Clark, Game Division Director Arnold Mitchell, Federal Aid Coordinator Frederick C. Hardy, Department Biologists and all other persons who had a part in the study.

INTRODUCTION

In 1959 Kentucky launched a six-year research study in an endeavor to determine the survival rates and factors affecting liberated pen-reared Reeve's pheasants (*Syrmaticus reevesii*). This study was incorporated as a phase of Pittman-Robertson Project W-38-R, Special Problems Investigations.

Methods employed in all project activities were essentially the same as those outlined in other Kentucky studies of this nature. Releases were confined entirely to preselected study areas and systematic follow-up activities were conducted by trained personnel.

The original brood stock of forty birds was secured from the Waterloo Experiment Station at Athens, Ohio, in February 1958.

In its native range the Reeve's pheasant is found in the hill country of Central and North China; Western Chihli, Shansi, Southeastern Shensi, Hupeh, Western Honan, Anhivei, Northern Szechuan and has been successfully established in North Central France.

As the Reeve's was publicized to be native to wooded mountainous terrain the two original release areas, Black Mountain and Kentucky Ridge, were selected in forested areas of the Appalachian Plateau-Eastern Division. To determine the effects of various altitudes and diversified habitat types, other areas at lower elevations were selected as additional release stock became available. Elevation of the release areas ranged from 500 to 4,000 feet above mean sea level.

The Black Mountain area is approximately eighteen miles long and is located near the summit of Black Mountain in Harlan and Letcher Counties in Eastern Kentucky. The terrain is extremely rugged but some fairly level sites are found along the trail at the summit. This forest consists primarily of mixed hardwoods, particularly oak (*Quercus spp.*), hickory (*Carya spp.*), maple (*Acer spp.*), and chestnut (*Castanea dentata*), but is well interspersed with abandoned farm land and heavily cut-over timberland. Consequently, numerous grape (*Vitis spp.*) thickets and brushy areas containing a variety of shrubs and herbaceous species are present. This area is under the ownership of the United States Steel Corporation.

The Kentucky Ridge Forest area is located in Bell County and embraces approximately 2,000 acres of rocky, mountainous land. The summit of two mountain ranges, Pine Mountain and Log Mountain, running parallel in a southwest direction, serve as boundaries for this area. Three roads traverse this forest which is bounded on the north and south by fire trails. A state highway divides the area into two parts. The Pine Mountain chain contains a mixture of hardwoods (oak, maple, hickory) pine (*Pinus spp.*) and a variety of shrubs including rhododendron (*Rhododendron spp.*), mountain laurel (*Kalmia latifolia*), azalea (*Azalea spp.*) and blueberry (*Vaccinium spp.*). The Log Mountain slope consists primarily of mixed hardwoods but the species found are beech (*Fagus grandifolia*), oak, maple, hickory and yellow poplar (*Liriodendron tulipifera*) with more grape and herbaceous plants and compares quite favorably with the Black Mountain area.

Although the Cumberland area is considered a pine-type habitat, a deciduous forest persists, particularly on the slopes and in the drainages. This forest contains a mixture of pine, hemlock (*Tsuga canadensis*), rhododendron, oak, hickory, black gum (*Nyssa sylvatica*), maple and a variety of shrubs and herbaceous plants. This area is a part of the Daniel Boone National Forest and is located in McCreary County.

The Putney area is located atop Pine Mountain near Putney in Harlan County. Releases were effected in habitat conditions comparable to that found on Pine Mountain at the Kentucky Ridge area. The only deviation of any consequence is in altitude above mean sea level. This area transcends the Kentucky Ridge area by approximately 1,000 feet.

The Pennyrile area, situated in the transitional zone between the Western Division of the Appalachian Plateau and the Mississippian Plateau, is located within the boundary of the Pennyrile State Forest in north Christian County. The terrain is rolling although a 150-foot variation in elevation exists. The forest type is a mixture of second growth hardwoods, pine and cedar (*Juniperus virginiana*).

Topography of the Robinson Forest area is a sharply rolling mountainous area containing, primarily, a mixed hardwood-softwood forest type. Some abandoned farm land is found within the boundary of this tract. The area is owned by the U. S. Department of Agriculture and is managed by the University of Kentucky.

The total number of Reeve's liberated at the Greenbo, Putney and Robinson Forest areas was negligible.

RELEASES

A total of 6,815 (3,614 cocks, 3,201 hens) pen-reared juveniles and 859 (94 cocks, 765 hens) adult Reeve's was liberated at seven study areas. The adult birds liberated were 13-15 months of age and the juveniles ranged from 11 to 19 weeks.

Sex ratios of liberated Reeve's were 93 cocks per 100 hens. Release data, including sex ratios and age data, for the various study areas are contained in Tables I and II.

The initial release of Reeve's was conducted at the Black Mountain study area on August 27, 1959. Due to the limited number of birds available for stocking the first year, releases were confined to the Black Mountain and Kentucky Ridge areas. Malfunction of incubators at the State Game Farm during 1961 resulted in the loss of several hundred Reeve's prior to complete embryonic development. Consequently, the number of birds for stocking purposes was considerably lower than was anticipated and two areas, Kentucky Ridge and Putney, were not stocked in 1961. As other areas contained comparable habitat components, the Putney and Robinson Forest areas were not stocked in 1962. The Cumberland, Greenbo and Pennyrile areas were the only study areas to receive stock in 1963.

Late hatches of Reeve's produced at the State Game Farm were not usually as well developed as the stock from previous hatches, consequently birds liberated late in the season were in comparatively poorer condition. A scheduled release of 500 birds at Black Mountain in 1961 was modified so that half would be liberated at Robinson Forest. As

TABLE I — REEVE'S RELEASES
1959-63

Area	Cocks	Hens	Sex?	Total	Sex Ratio Cocks/ Hen	Neck Tags	Release Date
Cumberland	266	230		496		Dark Green	8-17-60
	230	265		495		Yellow, White	8-16-61
	267	470		737		Blue	7-18-62
						Lt. Green	9-20-62
	155	193		348		White, Green	7-30-63
						Yellow, Blue	8-21-63
Total	918	1,158		2,076	.79:1		
Greenbo	24	24		48		Dark Blue	9-16-60
	35	15		50		Yellow	9-27-61
	62	34		96		Dark Blue	8-17-62
	46	54		100		Yellow	8-28-63
Total	167	127		294	1.32:1		
Kentucky	146	138		284		Dark Blue	9-23-59
Ridge	191	309		500		Pink	9 -7-60
	264	227		491		White	9- 6-62
Total	601	674		1,275	.89:1		
Pennyrile	217	262		479		Dark Blue	10-14-60
	35	35		70		White*	11-14-61
	377	372		749		Yellow	8-16-62
	223	263		486		Green, Yellow, Red	10- 2-63
Total	852	932		1,784	.91:1		
Putney	127	111		238	1.14:1	Yellow	10-27-60
Black	275	206		481		White	8-27-59
Mountain	251	239		490		Lt. Blue	9-14-60
	119	130	—12**	249		Green	9-21-61
	254	234		488		Red	9-27-62
Total	899	809	—12	1,708	1.08:1		
				—12			
				1,696			
Robinson	25	25		50		Dark Blue	9-16-60
Forest	119	130	+12**	261		Green	9-20-61
Total	144	155	+12	311			
Grand Total	3,708	3,966		7,674	.93:1		

* A hen with green neck tag numbered 47,492 was also liberated at this area.

** Twelve birds, sex unknown, escaped at Robinson Forest.

TABLE II — REEVE'S AGE DATA
1959-63

Age	Black Mountain	Cumber-land	Greenbo	Ken-tucky Ridge	Penny-rile	Putney	Robinson Forest	Total
11 weeks	98	452	..	56	..	..	..	606
12 weeks	129	179	148	44	..	32	50	582
13 weeks	..	113	96	..	60	44	..	313
13-14 weeks	237	..	..	..	..	..	192	429
14 weeks	97	155	..	..	249	113	..	614
15 weeks	746	94	..	675	817	49	..	2,381
16 weeks	..	543	..	116	463	..	..	1,122
17 weeks	..	..	..	218	194	..	..	412
18 weeks	..	..	..	..	..	..	69	69
19 weeks	236	..	..	..	..	..	..	236
26 weeks	..	..	..	..	1	..	..	1
Unknown	..	..	50	..	..	..	..	50
Adults	153	540	..	166	..	..	..	859
Total	1,696	2,076	294	1,275	1,784	238	311	7,674

the birds were already crated, it became necessary to attempt segregation into consecutive band series for each release. The distance and time involved necessitated holding the Black Mountain birds in crates overnight. As a result, the major portion of these birds were in an extremely weakened condition when released. Mortalities enroute were not excessive but it was believed that their condition may have increased the initial mortality. With these exceptions the general physical condition of release stock was considered good. A large percentage of the total number of pheasants liberated were confined to flight pens for several weeks prior to their release. At the time of release, numerous birds were observed to make well sustained flights and were able to fly through the forest with little difficulty. No special effort was made to compare flight capabilities of conditioned birds with non-conditioned birds.

It was noted that the position of crated birds on the carrier apparently affected the mortality of pheasants enroute to the areas. A higher rate of mortality was observed among birds that were subjected to the full force of the wind and sun. This was particularly intensified during hot humid weather.

As an aid to future identification, all liberated birds were marked with plastic neck tags and metal leg bands. A pheasant neck tag described by Nelson[1] was used. The tag was 3½ inches by ⅝ inch and a No. 1 pin was used. Numbers, corresponding to numbers on leg bands, were so placed as to be visible on live birds. "Kentucky Game Division" was stamped on the back of the tag to identify origin of these birds when recovered. See Table I for color of tag used at various release areas.

To determine the optimum stocking density of released pen-reared Reeve's, the number of birds liberated at each site varied from 10 to 200 pheasants per site. In instances where large groups of birds were liberated, the site was selected on the basis of the condition, extent and juxtaposition of available habitat. This method was used at the Cumberland and Kentucky Ridge areas. Birds were released in groups of 15 to 200 birds at seven pre-determined sites on the Cumberland area and in groups of 32 to 81 at nine pre-selected sites at Kentucky Ridge. Releases at the Pennyrile area in 1962 and the Pennyrile and Cumberland areas in 1963 were confined to the vicinity of four range feeders at each area.

Birds were crated and taken from the State Game Farm on the day following the tagging and were liberated immediately upon arrival at the area. One deviation from this procedure was undertaken in 1961 when the birds were crated when tagged, and transported to the Pennyrile area during the night. Twenty-one birds were lost enroute.

In an attempt to retard dispersal and to determine the holding capabilities of commercial grain, four "range type" feeders were placed at the release sites on the Pennyrile area in 1961 and at the Cumberland

[1] Nelson, Lee K., 1955. A Pheasant Neck Tag. Journ. Wild. Mgt., 19(3):414-415.

area in 1963. These feeders were filled with coarse cracked corn at the time of release and were refilled as needed.

MORTALITY

Follow-up activities in the vicinity of the release sites and contacts with sportsmen and cooperating agencies effected the recovery of 139 mortalities. This was less than two percent of the total number liberated. The sex ratio of the known mortality was 105 cocks per 100 hens as compared to a release ratio of 93 cocks per 100 hens.

The band and/or tag were recovered in 103 of the reported fatalities resulting in positive identification of 74 percent of the known mortality. As an indication of the effectiveness of neck tags for identification purposes, tags were recovered in 69 percent and bands in 45 percent of the known mortality. In some instances the tag was observed before the carcass. Considerable searching was sometimes necessary for recovery of the band.

Avian and mammalian predation accounted for 42 of the fatalities, nine were shot illegally, eight were killed by automobiles, one flew into a wire, 13 carcasses were found intact and an additional 66 expired from unknown causes. It was determined that the known seven fox (*Vulpes fulva* or *Urocyon cinereoargentatus*), twelve hawk (*Buteo spp.* or *Accipiter cooperi*), one mink (*Mustela vison*) and four weasel (*Mustela frenata*) predations accounted for 57 percent of the reported predation mortality. In two instances red-tailed hawks (*Buteo jamaicensis*) were flushed from the carcass of freshly killed Reeve's. On five other occasions hawks were observed attempting to catch liberated Reeve's. A large unidentified hawk maintained an almost daily vigil at a cornfield on the Cumberland area throughout most of the winter of 1962-63. Seven Reeve's were using this field in December 1962 but only three hens were known to be in the vicinity in April 1963. It is believed that this avian predator was one factor influencing the decline in number of this flock. Weasels were responsible for at least three mortalities found on the Cumberland area and one found at the Pennyrile area. An examination of these carcasses revealed that the skull had been opened and only the brain tissue removed.

Apparently some hunters experienced difficulty distinguishing Reeve's hens from ruffed grouse (*Bonasa umbellus*) as four were mistakenly killed as grouse and another was thought to be a gray squirrel (*Sciurus carolinensis*).

Shell shot indentations and holes in feeders at the Pennyrile area indicated that poachers may have killed or attempted to kill feeding Reeve's but personnel were unable to determine if shooting was due to poaching or vandalism. One feeder on the Cumberland area was damaged by 22 caliber bullets and several shell cases were found in the vicinity.

Table III contains data regarding mortality and causes of known mortalities.

TABLE III — REEVE'S MORTALITIES AND CAUSES
1959-64

Area	Sex			Band and Tag Recovered	Tag Rec.	Band Rec.	Neither Rec.	Causes						
	Cocks	Hens	Sex?					Pred.	Unk.	Shot	Veh.	Wire	Died	Total
Black Mountain	20	18	4	22	12	2	6	16	20	4	1	..	1	42
Cumberland	13	15	3	15	11	2	3	9	15	1	3	1	2	31
Greenup	..	1	..	1	..	..	..	..	..	1	..	..	..	1
Kentucky Ridge	2	4	2	5	1	..	2	1	1	1	1	..	4	8
Pennyrile	24	22	2	9	15	3	21	15	27	..	3	..	3	48
Robinson Forest	5	1	3	4	1	..	4	1	3	2	..	..	3	9
Total	64	61	14	56	40	7	36	42	66	9	8	1	13	139

MOVEMENT STUDIES

Interviews with landowners, hunters, merchants and others not connected with the study revealed that liberated Reeve's at Black Mountain and Kentucky Ridge indicated a tendency to range farther from the point of release than did birds released at the other areas.

Reeve's were observed at distances up to ten miles from the nearest release site on the Kentucky Ridge area and known movements on the Black Mountain area ranged up to twelve miles. Installation of feeders at the Pennyrile and Cumberland areas appeared to be of considerable importance in retarding dispersal from the immediate vicinity of the release sites, particularly during the first post-release days. It appeared that grain scattered on the ground in the vicinity was a more effective retardent than were the feeders. Dispersal was more rapid after this scattered grain was consumed.

Project personnel observed three cock birds near the Pine Mountain Lodge on August 23, 1963. One bird marked with a white tag, had been released at this area September 6, 1962. Neither bands nor tags were present on the other birds. All three were quite tame and the writer was able to approach within four feet of two birds. Tail length of one bird, measured by its relation to objects on the ground, was forty inches.

Installation of range feeders at the Cumberland area in 1963 appeared to retard the normally rapid dispersal of birds from the area. On two occasions flocks of 10-15 birds were observed leaving the vicinity of range feeders. The writer was able to turn these birds and successfully drive them several hundred yards to the feeders.

At the Robinson Forest area a flock of fourteen liberated pen-reared Reeve's dispersed from release sites to a barn lot shortly after being released and remained in the vicinity throughout the winter of 1961-62. Three hens and one cock were observed in and near this lot during April 1962. This semi-domestic cock remained in the area until killed by a poacher in December 1962. Another occurrence of domestic tendencies of Reeve's at this area was illustrated by a hen that roosted and fed with a flock of chickens throughout the winter of 1961-62.

REPRODUCTION

Instances of Reeve's "drumming" suggested that this activity may sometimes be associated with a breeding display. In April 1963, a fight developed between two cocks after one of the birds was observed "drumming." Other instances of this display tended to indicate that this action may be a warning system. An alarmed cock at the Cumberland area was observed to "drum" and was answered immediately by an unseen bird. At the end of this action by the second bird, four cocks flushed from the understory and flew into dense cover in the hollow while the first cock followed rapidly on foot. At the Pennyrile area, it was noted on several occasions that the approach of vehicles apparently stimulated the cocks to "drum." This display is similar to that of ruffed grouse except that the Reeve's "drumming" is not known to be confined to any particular season or site and none have been observed using objects for a "drumming" perch. No pattern or consistency to Reeve's "drumming," other than described, was discovered.

With one exception, the unsuccessful nesting attempt of a Reeve's hen from a non-project release, no nesting activities were observed during the tenure of the project. It was known, however, that some reproduction did occur as a total of ten broods containing 99 chicks were reported.

POPULATION DATA

Field Observations—The installation of feeders at the Pennyrile and Cumberland areas apparently enhanced and effected a greater retention of birds on the areas. The number of observations per hour of field time expended at these areas more than doubled after feeders were installed.

A total of 2,308 (1,314 cocks, 787 hens, 207 sex?) Reeve's observations was recorded during 3,117 man-hours of field activities. The sex ratio

of field observations was 167 cocks per 100 hens as compared to a release ratio of 93 cocks per 100 hens. The Black Mountain area reported the greatest occurrence of observations with an average of 1.28 birds per man-hour of field time. The low average was at Kentucky Ridge where an average of .12 birds per hour of field time was indicated. The overall average for all areas was .82 birds. The use of plastic neck tags effected the identification, as to location and date of release, of 74 percent of the reported observations. Tags were either missing, not identified as to color or were not seen, on the remaining 599 birds (Table IV).

TABLE IV — REEVE'S OBSERVATIONS
1959-64

Area	Observations			Total	Number Field Hours	Birds Observed Per Field Hour	Identification of Tag			
	Cocks	Hens	Sex?				Tag. Ident.	Tag Not Ident.	Tag Not Observed	Tag Missing
Black Mountain	314	141	63	518	404	1.28	379	31	105	3
Cumberland	618	448	102	1,168	1,136	1.03	945	39	183	1
Kentucky Ridge	29	8	19	56	587	.09	25	23	4	4
Pennyrile	330	172	9	511	797	.64	306	54	146	5
Robinson Forest	23	18	14	55	193	.28	54	..	1	..
Total	1,314	787	207	2,308	3,117	.74	1,709	147	439	13

The major portion of the observations occurred in mixed hardwoods and grape thickets, especially where these habitat conditions existed alongside trails or abandoned fields.

Hunter Contacts—Squirrel and grouse hunters were interviewed in regards to Reeve's observations. A total of 54 hunters reported seeing 68 (8 cocks, 15 hens, 45 sex?) Reeve's during 166 hours of hunting time. This was an average of .41 birds per hour of field time (See Table V).

TABLE V — REEVE'S OBSERVATIONS REPORTED BY HUNTERS

Area	Number Hunters	Number Observed				Total Number Hours	Birds Per Hour
		Cocks	Hens	Sex?	Total		
Black Mountain	2	6	3	..	9	3	3.00
Cumberland	30	..	4	39	43	98	.44
Kentucky Ridge	20	2	8	4	14	61	.23
Robinson Forest	2	..	..	2	2	4	.50
Total	54	8	15	45	68	166	.41

Live Trapping—In 1959 a Reeve's cock was captured in a cloverleaf trap on the Kentucky Ridge area on the sixth post-release day. A total of 170 trap-days was expended on this area in 1959.

On September 22, 1960 an unmarked juvenile Reeve's hen, approximately eight weeks of age, was caught in a grouse trap at the Black Mountain area. It was believed that this bird was a wild descendent of

birds released at this area in 1959. Detailed examination was impossible as the hen escaped by flying through the netting of the trap when approached. It was noted that this bird reacted much more violently than do native grouse under similar circumstances. Four Reeve's (2 cocks, 2 hens) were captured during a total of 147 trap-days expended at this area in 1960. All trapping was incidental to grouse trapping.

HABITAT UTILIZATION

Ninety-one per cent, or 2,093, of the 2,308 Reeve's observations recorded during the tenure of the project occurred in pure stands of mixed hardwood (particularly oak and chestnut stands), or mixed stands of hardwood containing one or more of the following woody and/or herbaceous species: grape, annual weeds, pine, laurel, smilax and in trails adjacent to one of the aforementioned cover types. The remaining 185 observations occurred in pine thickets, plum thickets, abandoned fields, corn fields, grape tangles and in 30 instances the cover type was not reported.

No adverse effects to native game populations was noted. Some evidence was found to indicate that the food habits of Reeve's pheasants were quite similar to that of ruffed grouse and it is possible that some inter-specific competition could result, particularly during years of low mast production.

Influence of Climate—Some evidence was found to indicate that Reeve's may not be as vulnerable to adverse weather conditions as some native species.

A hen mistakenly killed by a grouse hunter atop Black Mountain in Virginia on November 17, 1959 was examined by project personnel. Several grouse had also been killed and upon examination they were found to have their tails covered with ice while no ice was found on the Reeve's. The temperature was 8 degrees and the Reeve's appeared to be taking the extreme cold better than the native grouse.

Fresh tracks of five Reeve's were observed in the snow at the top of Black Mountain in February 1960. Snow depth averaged eighteen inches with drifts up to three feet. Reports of pheasants scratching through twelve to fifteen inches of snow to feed on acorns were received.

The winters of 1959-60 and 1962-63 were unusual for Kentucky. The weather during 1959-60 was characterized by heavy snowfall with snow remaining on the ground for rather long periods. Much of the snow came late in the season. Subzero temperatures over long periods predominated during the winter of 1962-63. Some detrimental effects to Reeve's may have occurred, but if so they were not detected and several Reeve's were known to have survived during both winters. One cock pheasant at the Robinson Forest area was known to have died during severe cold weather in February 1962 but it was not determined if this fatality was due to weather or if other factors were involved.

Food Habits—Examinations of the crop contents of dead birds and dozens of feeding observations indicated that food habits and materials utilized varied considerably and were probably not serious factors affecting survival of this species in Kentucky. Some of the materials found in the digestive tracts of dead birds were: acorns, hawthorn (*Crataegus spp.*), persimmon (*Diospyros spp.*), grasshoppers (*Romalea spp.*), beetles, caterpillars, panic grass seed (*Panicum capillare*), black gum and *Korean lespedeza.*

Project personnel observed Reeve's feeding on pokeberries (*Phytolacca americana*), acorns, blueberries (*Vaccinium spp.*), blackberries (*Rubus spp.*), waste corn, wheat, insects and grain from feeders.

The crop contents from a Reeve's and the contents from several grouse that were killed in the same general area were examined and found to contain identical materials. Acorns and fruit of the hawthorn were found in the digestive tract of both species.

Reeve's observations, tracks and other signs indicated that pheasants utilized cracked corn from range feeders throughout the winter of 1961-62, 1962-63 and 1963-64. At some sites the extent of utilization necessitated refilling feeders at frequent intervals.

CONCLUSIONS

The results derived from this six-year investigation of survival rates and factors affecting population dynamics of liberated pen-reared Reeve's pheasants were most discouraging and indicated that establishment of this species in Kentucky is not possible.

Releases totaling 7,674 birds were effected at seven study areas. It was felt a sufficient number of birds were liberated for an adequate test. The experiment was conducted at different levels of elevation and under various habitat conditions and yet the end results were negative.

It is believed that excessive mortality and a limited reproductive capability were probably the most important factors influencing the survival. The known reproduction of ten broods during the tenure of the study was only negligible and was not considered of sufficient magnitude to maintain a population. The initial post-release mortalities were not excessive, as compared with data obtained from other Kentucky studies involving introduced foreign game birds, but the declining number of post-release observations and the diminishing number of reports from surrounding areas indicated a rather rapid decline in population.

Dispersal did not appear to be excessive since the greatest known movement did not exceed twelve miles.

An extremely high occurrence relationship of post-release observations in mixed hardwood stands indicated a preference of Reeve's for this habitat type.

Future introductions of this pheasant in Kentucky is not recommended.

COMMITTEE REPORT
FARM GAME COMMITTEE

The S. E. Association of Game and Fish Commissioners

and

The S. E. Section of the Wildlife Society
New Orleans, Louisiana
September 25-27, 1967

During the past 10-15 years the Farm Game Committees have discussed numerous problems confronting game managers, administrators, sportsmen, etc. A detailed resume of the previous discussions and recommendations was made at the 1965 fall meeting.

Prior to 1966, the Farm Game Committee usually consisted of 3-5 members that were selected by the committee chairman; the chairman being appointed by the President of the Southeastern Section of the Wildlife Society, to serve for a two-year period.

In 1966, the method of selecting committee members was changed so that the director of each southeastern state could appoint a member to the committee. At the same time, all directors were informed that they would receive copies of all correspondence mailed to their respective committee members so as to keep them advised of the committee's activities. This arrangement was readily accepted by the directors.

The 1966 committee chose one topic, "landowner incentive" or fee hunting of farm game, as the principal discussion subject for the fall meeting in Asheville, North Carolina. The information obtained from questionnaires sent to all committee members, along with pertinent remarks made at the committee meeting in Asheville, is included in the 1966 Proceedings of the Southeastern Association of Game and Fish Commissioners.

In the spring of 1967, each director was asked again to appoint a member for the Farm Game Committee. All 1966 members were reappointed for this year. Having assumed that the "landowner incen-

tive" problem would eventually be solved by initiative of local sportsmen, the committee members were asked to participate in two separate endeavors this year. These requests involved:

1. An assimilation of literature published on farm game by personnel of member states, excluding those papers published in the Proceedings of the Southeastern Association of Game and Fish Commissioners.
2. Suggested topics for discussion at the Farm Game Committee meeting in New Orleans, Louisiana.

At the Farm Game Committee meeting yesterday, September 25, 1967, the committee members unanimously adopted a resolution to revise and edit the "List of Farm Game Publications" for inclusion in the 1968 Proceedings of the Southeastern Association of Game and Fish Commissioners fall meeting. The revised publication list will include only technical papers on farm game published by personnel of member states in magazines, transactions, etc., other than those papers that are included in the Proceedings of the Southeastern Association of Game and Fish Commissioners Conference.

The committee also recommends that the membership of the Farm Game Committee hereafter be established in the same manner as during the past two years with the game and fish director of each state being allowed the prerogative to appointing a member to the committee. The chairman of the Farm Game Committee, to be appointed by the President of the Southeastern Section of the Wildlife Society, may appoint additional members from other agencies as deemed necessary.

The suggestions for topics to be discussed at the fall meeting of the Farm Game Committee included items from both management and research areas. Generally speaking, these included such topics as landowner incentive, government subsidies for farm game management, leasing of privately owned land for farm game hunting and farm game research needs; all of which have been discussed and re-discussed by most of the previous farm game committees. After prolonged discussion of the various problems concerning farm game, it was generally agreed that these problems are being compounded and the need for research in certain areas is needed more than ever. Specific recommendations include the need for research to determine how much more of the farm game can be harvested and means through which more farm game can be produced in certain types of habitats.

The concluding recommendation of the present Farm Game Committee was that future members of this committee be thoroughly informed of all current and future government subsidy programs that can be utilized to promote more and better hunting of farm game species.

Respectfully submitted,

Lloyd G. Webb, (S.C.) Chairman
Edward P. Hill III (Ala.)
Gene Rush, (Ark.)
Hubert Handy, (Ga.)
Dan Russell, (Ky.)
Robert Murry, (La.)
Jack A. Stanford, (Mo.)
Earl H. Hodil, (Md.)
Ted T. Mitchell, (N.C.)
Karl F. Jacobs, (Okla.)
Chester McConnell, (Tenn.)
C. H. Shaffer, (Va.)

(COMMITTEE CHAIRMAN'S NOTE: At a meeting of the Southeastern Section of the Wildlife Society, September 26, 1967, in New Orleans, Louisiana, the recommendation that the game and fish directors of each state be allowed the prerogative of appointing committee members was tabled.)