HARVEST RETURNS OF PEN-REARED BOBWHITE QUAIL

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INTRODUCTION

During 1954-1959 an intensive Bobwhite Quail (Colinus virginianus) management program was conducted on The United Electric Coal Companies Inc. properties located west of DuQuoin, Illinois. This program included the release of banded, pen-reared quail at various times of the year. This paper reflects the harvest of these birds during a 6-year period and contributes a comparison with the harvest of wild birds.

METHODS

Dates of release, total numbers released, and population of wild birds appear in Table 1. All birds liberated in the summer and fall were young-of-the-year while spring releases represented quail hatched the previous summer. The gentle-release technique (Baumgartner 1944) was employed. Summer and fall liberations represented groups of 20 to 25 birds placed in or near food plots. In spring birds were released in groups of three pairs where suitable nesting habitats prevailed. In summer and fall of 1955 food and watering devices were maintained at release sites for 2 to 4 weeks. All quail bore a leg band with a number and address for return to the researcher.

In 1954, 1955, and 1956 the majority of the quail were obtained from the Illinois Department of Conservation as 1-day-old chicks and reared in McCarty-type pens. Releases during the hunting season in 1956 were locally purchased birds. During 1957 through 1959 the birds were purchased from local sources immediately prior to the hunting season. The quail in 1954 through 1956, released in advance of the hunting season, were 10-12 weeks of age when liberated; for the remaining years all birds were at least 16 weeks of age.

Generally, all quail were raised under conditions comparable to those utilized by sportsmen clubs throughout Illinois. On the basis of weight they were in good condition; however, some had frayed body and wing feathers.

Hunting on these properties was limited to company officials and guests. Although some were experienced quail hunters, many were not. Except for 1954 when there was deliberate effort to limit hunting, hunter pressure was high. This was reflected in man-hours-of-hunting

Table 1. The contribution of pen-reared and wild bobwhites to hunter harvest, United Electric Coal Companies, Inc., 1954–1959.

Year	Pen-reared				Wild			Total Quail Harvested	Percent of Harvest Pen-reared Birds
	Time of Release	Number Released	Harvested No.	Harvested %	Number at Fall Census	Harvested No.	Harvested %		
1954	Aug. 15-17	145	6	4.1					
	Sept. 25-26	217	12	5.5					
		362	18	4.9	301	40	13.3	58	31.0
1955	July 15-19	490	29	5.9					
	Aug. 25-30	495	41	8.2					
	Sept. 28-30	455	70	15.3					
	Nov. 11-25	260	156	60.0					
		1,700	285	16.8	504	300	59.5	585	48.7
1956	Nov. 5-7	573	125	21.8					
	Nov. 17-31	90	50	55.6					
		663	175	26.4	667	226	33.9	401	43.6
1957	Mar. 29-30 & Apr. 17	83	0	0.0					
	Nov. 1-2	1,056	88	8.3					
		1,139	88	7.7	747	334	44.7	422	20.9
1958	Nov. 1	493	41	8.3					
	Nov. 15-20	57	20	38.6					
		550	61	11.1	598	308	51.5	369	16.5
1959	Apr. 2	160	1	0.6					
	Oct. 30	645	108	16.7					
		805	109	13.5	486	196	40.3	305	35.7
Totals		5,219	736	14.1	3,303	1,404	42.5	2,140	34.4

as well as success of hunters and behavior of the quail. The average hunting ability of these participants was probably less than those hunting quail generally. Success of inexperienced hunters was enhanced by released birds as they represented easier targets. In fact, novice hunters were frequently guided to where liberated quail were known to be present.

RESULTS AND DISCUSSION

The results, as based on number of released birds harvested, showed a direct relationship with the time of liberation (Tables 1 and 2). Lowest (0.4 percent) returns were realized from spring releases and highest (38.6 to 60.0 percent) from releases during the hunting season; the latter were handled on a put-and-take basis. No attempts are made to explain the difference in returns of mid- and late-summer liberations. In 1954 hunting pressure was 40.0 percent less than in subsequent years; this may account for the lower return that year.

Table 2. Relationship of time of release to harvest of pen-reared bobwhites, United Electric Coal Companies, Inc., 1954-1959.

Time Released	Number Released	Birds Harvested	
		Number	Percent
7-12 weeks before hunting	1,802	147	8.2
2-3 weeks before hunting	2,767	362	13.1
during hunting	407	226	55.5
spring	243	1	0.4
Totals	5,219	736	14.1

These findings parallel those reported by several other investigators. In Indiana, Reeves (1954) found a 2.4 to 15.5 percent harvest of summer and fall releases; the average was 4.0 percent. He reported that birds 14 to 15 weeks of age showed the highest survival rate. Gerstell (1938) showed a harvest of 0.84 percent of fall releases and 0.06 percent of spring liberations in Pennsylvania. Oklahoma studies (Brill 1941 and Hanson 1947) revealed a hunter harvest of 1.3 percent of liberated birds. In Illinois Hart and Mitchell (1941) recorded an 18.0

percent return for autumn releases and no return for spring releases. In Louisiana Campbell et al. (1943) found 7.0 percent of fall releases in hunters' bags; they estimated that 61.0 percent of spring released pairs raised broods but only 3.0 percent of all of those released were harvested. The basis for determining the success of spring releases in reproduction was not indicated. An exhaustive study in Kentucky (Pierce 1951) showed a 4.3 percent return of released quail in the hunter harvest. In contrast to data of all other researchers, Baumgartner (1944) estimated a 50.0 percent survival of young birds until the hunting season and a 45.0 percent survival until the following breeding season. These survival levels were believed due to sudden depletion of wild populations which created unoccupied, quality quail habitats.

Significant in the results of this study was the quality of hunting provided. Experienced hunters could not distinguish differences in behavior of wild and released birds when liberations were made no later than September. Seemingly, there had been a joining of wild and released birds into individual coveys. Such combinations before the hunting season of these respective birds were not common for those liberated in November. The experienced hunter detected differences in the behavior of these two groups of birds; released quail flushed slower, flew shorter distances, scattered more readily, and often lit in trees. These characteristics allowed distinction of pen-reared birds from wild birds even when there had been a joining of the two groups. However, they provided reasonably acceptable hunting for the inexperienced hunter.

The quail released on a put-and-take basis contributed low quality hunting. Frequently they had to be "kicked" to promote flying; they flew slowly, just above the vegetation and less than 100 yards; they scattered wildly; and they often lit in trees. Once dispersed they began calling immediately and moved on the ground in little or no cover showing no attempt to hide or "freeze." The presence of predators seemed not to influence this behavior as reported by Pierce (1951). Bird dogs were confused by such activities and were difficult to manage. In areas where such releases were made, dead birds were found frequently. Such observations were similar to those of Pierce (1951).

Shortly after quail releases were made an influx of avian and mammalian predators was noted. This was most obvious where liberations for put-and-take shooting occurred. Because these birds had been dispersed by hunting shortly after release, they were probably more vulnerable and showed less caution when regrouping as noted by Pierce (1951). For example, in one 40-acre field at 4 p.m. two red foxes (Vulpes fulva), two barred owls (Strix varia), one coopers' hawk (Accipiter cooperii), four red-tailed hawks (Buteo jamaicensis), and one marsh hawk (Circus cyaneus) were observed hunting the field. Within a period of 15 minutes three avian predators made kills.

When feed and water were provided at release sites there was a tendency for the quail to remain in the immediate vicinity of these for 10 to 12 days. Tracks of foxes were concentrated in such sites and 50 scats showed quail remains in 31; 12 leg bands were recovered. There

was less tendency for quail to remain near release sites when food and water were not provided; and, less predation was believed to have occurred. These observations confirm Pierce's (1951) data.

Band returns from quail released September or earlier indicated a general dispersal of 0.3-0.5 miles from the release site within 2 to 3 weeks. Reeves (1954) reported movements of 0.1 to 12.0 miles; Pierce (1951) recorded 0.02 to 3.0 miles with an average of 0.5 miles; and, Brill (1941) recorded an average movement of 2.2 miles. In this study some released birds moved 4.0 to 6.0 miles. Approximately 14 months following liberation one bird moved 12.0 miles. For quail released 10 to 12 days before hunting, there was general movement of 0.2 to 0.3 miles. Hunting 40 days after release yielded two bands from birds that traveled 2.0 miles. These data suggest increased distances traveled with the length of interval between the release and harvest. Reeves (1954) noted distances moved to be roughly inversely proportional to the age of birds when released as older birds tended to keep together better than younger birds. He was of the opinion that how soon they joined wild coveys was reflected in distances moved: the sooner they joined the less the movement.

The released quail in this study contributed to annual harvests despite low returns. Even when expense and waste are considered in providing hunting for guests of the coal company, a contribution of 14.1 percent (ranges of 16.5 to 48.7%) to the annual harvest is significant. However, only a small segment of the contribution can be considered quality hunting as most released birds harvested were liberated 10-12 days before the season or on a put-and-take basis. A 14.1 percent return from all releases cannot be considered a sound practice for extensive quail management. Probably, higher returns and higher quality hunting can be expected with superior rearing techniques, especially for put-and-take type hunting. But, this requires the extra effort and well-planned facility not evidenced by those engaged in holding and rearing quail.

In contrast to 14.1 percent of released bobwhites in the hunter's bag, 42.5 percent of the censused, wild-bird populations were harvested. This was higher than the overall harvest for entire states which Reeves (1954) believed to be about 25.0 percent in Indiana. Seemingly, this higher harvest might have been a result of pen-reared quail in the population. They may have caused wild birds to be more vulnerable because of their general lack of caution. However, the presence of entire coveys of pen-reared birds in 1956-1959 might have taken some pressure off wild birds because the former were easier to locate as coveys and as singles. This was especially true for releases made 10 to 12 days before the season. During the first week or two released birds tended to not join wild coveys. However, after this time 92.0 percent of the coveys from which birds were harvested both wild and pen-reared quail were taken.

It is significant that the ratio of wild to pen-reared quail in the harvest changed as the season progressed. The first week of the season, liberated birds represented 61.0 percent of the bag; the second week

44.0 percent; the third week 31.0 percent; and the last week 16.0 percent. This probably reflected heavy loss of pen-reared birds due to various factors, including hunting.

It is believed that hunting greatly accelerated the rate of loss of released birds. This was a consequence of harassment by repeated disturbance and dispersal of coveys. Such harassment may have resulted in more rapid joining of liberated birds with wild coveys and produced increased survival value; this was possibly offset by mortality resulting from break-up of coveys. Dispersed, isolated, released quail showed little caution when attempting to reassemble with coveys; there was excessive calling, wandering, and a complete disregard for self-protection as observed by Pierce (1951). It seems likely that the presence of pen-reared quail increased predatory pressure on wild quail.

Quail liberated September or earlier contributed to the total harvest even though the percent of return was only 4.2 to 15.3. They yielded 31.0 percent and 23.9 percent of the total harvest in 1954 and 1955, respectively. Further, these releases provided quality hunting. The intensity of the hunting as well as control of hunters was important in these results. Therefore, one cannot anticipate similar experience in the absence of these conditions.

Although the contribution of spring releases cannot be determined as no reproduction was recorded, only 1 of 243 adults was harvested the following fall. Further, only two birds of any summer and fall releases were harvested the following hunting season.

This study, as well as those referenced and the summarization of restocking by Buechner (1950), fail to support artificial propagation as an acceptable practice in a state-wide quail management program. There is no evidence to support it biologically; and, certainly it is a clear misuse of state funds. Where private individuals or groups can afford ill-advised expenditures and tolerate low return of releases and/or accept low quality hunting, a contribution to hunter harvest may be experienced. But, no state can justify use of taxes or license fees to support the release of any wildlife into habitats either not suitable or already at the limit of carrying capacities. Most quail habitat in Illinois is at the limit of its carrying capacity; and, each year this is probably a little less than the year before. Current land-use practices which emphasize mono-agriculture. Large fields, fall preparation for spring planting, double cropping, reduced idle areas, and improved pasture land eliminate suitable habitats for wildlife of low mobility and occupants of the "edge." The single answer to declining quail populations is habitat restoration; but, this is probably possible for only intensively managed public-owned areas. These are too few and too dispersed to make a significant contribution state-wide. It is inevitable that quail populations will continue to decline in numbers as since the late 1800's. State-wide efforts in habitat restoration and management can reduce little the rate at which this decline occurs, because private enterprise provides little, if any, accommodation for such activities.

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