

2. Hunters disturb a very minimum of hens nesting during a spring season.
3. There is a surplus of mature males that should be harvested and such birds are most easily taken during the spring season.

Now that the facts have been considered, all evidence leads one to conclude that a spring gobbling season is biologically sound.

THE COTURNIX QUAIL PROJECT IN MISSOURI *

In the Spring of 1955, we bought 70 pairs of Coturnix from an importer in California. Then we leased the Lowrance Quail Hatchery near Joplin, the only hatchery in Missouri capable of conducting the production demanded for our large-scale project. The Missouri Conservation Commission does not own or maintain a game farm.

During the Summer of 1955 we raised 4 generations of young from the original 70 pairs; last spring (1956), 1,350 pairs of birds were available for study and as breeding stock. During 1955, we learned a great deal about the behavior and mass production methods of Coturnix. Problems remain, such as improving fertility and hatchability which have run rather low; these problems are being worked on. Under good hatchery conditions we were able to have five generations of Coturnix on hand the same year. The birds matured in 36 to 56 days; and we had fertile eggs from young Coturnix practically before they were in mature plumage.

Being prolific in the hatchery holds promise that in the wild they may produce more than one brood per year, and that early birds may begin nesting soon enough to produce a brood the same year.

Escaped birds found in the wild have averaged 10 eggs per clutch, with 100% fertility in the last 10 nests checked. Sixteen days of incubation by the hen is the rule; the chicks hatch much as do bobwhite, and leave the nest soon after hatching. To date, we have observed only the hens caring for nest and young.

We have tried cross-mating between bobwhite and Coturnix for the last two years, with no success in developing a cross. Will the birds cross? Studies to date show no indication of it and the chances are that it will rarely if ever occur.

During the Spring of 1956, we distributed Coturnix breeders to several states that were interested—Tennessee, Oklahoma, Alabama, Ohio, Nevada, Virginia, Georgia, Illinois, Kentucky, and Indiana are now producing Coturnix. Should they become established we will have added a fine little bird to our upland game list.

To date we have found that:

1. Coturnix can be mass produced in a hatchery.
2. The birds can nest and produce young here.
3. By maturing rapidly and laying early, the production potential is high.
4. The birds lay a strong scent discernible by dogs, and hold well.
5. The flight, different from bobwhite, is surprising and long; the birds will provide a sporting target.
6. Hunting Coturnix is similar to single shooting of bobwhite, as the birds do not covey but work as singles or pairs.
7. While smaller than bobwhite, Coturnix is good eating, its meat slightly darker than bobwhite.

The game potential of Coturnix is rather high. But:

1. Will the birds acclimate themselves to Midwest range and climate?
2. Will they migrate? If so, will they return to nest?
3. If the answers are "yes," will they become *permanently* established in a new geographic range?

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The answers lie in experimental releases and widespread field studies. So, for the next three years, we plan to make large-scale *spring* releases of the birds. We know that ducks and geese tend to return to their place of origin after migration. We hope that, if Coturnix migrate, they too will return to their place of hatching. We hope spring releases result in large-scale nesting in the locality of releases, and that such localities become focal points of these hatches. Time, observation and study by all personnel will determine the answers.

We are well on the way to producing 35,000 Coturnix during this production season; 20,000 of these are scheduled for spring release in 1957. During August (1956) small test releases were made on some of the Commission-owned areas in north Missouri. At one of these sites, birds released at 10 weeks of age produced young by late September. The purpose of these releases is to determine:

1. Dispersal tendencies of the birds, and fall shifting and migration.
2. Whether to make earlier spring releases on controlled or non-controlled areas.
3. Determination of late nesting and nesting by young produced earlier.
4. Testing of sporting qualities.

These north Missouri releases are made with the possibility of migration in mind. Should the birds shift south with cold weather, we have the length of the state in which to make possible collections. During the 1956 quail season we hope to secure band recoveries from birds released during August, so Coturnix will be included in the '56 bag. One fact should be made perfectly clear; this is not an attempt by the Conservation Commission to replace bobwhite quail with another bird. In many ways Coturnix does not measure up to our native quail, especially as to size, sporting qualities and food; however, Coturnix does very definitely possess good qualities that will make it a welcome addition to our game list, particularly in areas of the state no longer capable of supporting good populations of bobwhite or those areas that have never been able to produce good bobwhite populations. Coturnix may provide more targets for our increasing gunning pressure.

The following general information is given regarding this bird to provide a better understanding of it:

This is the Old World quail of Europe, Africa, Asia, Australia and adjoining islands. Although in the same family as bobwhite (*Phasianidae*), Coturnix is in a separate sub-family. Its many races can be studied in "Check-List of Birds of the World," Volume 2, by James Lee Peters. The bird selected as one most likely to succeed is *Coturnix coturnix japonica*, the Japanese Quail of eastern Asia. It is also known to breeders as the Japanese "king quail." The European Coturnix is quite similar; it migrates seasonally across the Mediterranean, from Europe to Africa.

This quail breeds in Sakhalin and the Japanese Islands, Eastern Siberia and North China. Migrating, it winters in Southern China, Siam, Indo-China, Formosa, Hainan, Burma and other parts of South Asia.

To the best of our knowledge, our breeding stock was three generations removed from stock originally shipped from Japan, and was secured from California.

Coturnix is smaller than the 6-7 ounce bobwhite. At 5 months, mixed sexes of Coturnix weigh 3 to 4 ounces, at 9 months the average weight is $4\frac{1}{4}$ ounces. Nine-month-old hens are slightly heavier than males. These are weights for hatchery-reared birds and would likely run higher than those in the wild.

Coturnix appears bobtailed, for its tail is much shorter than bobwhite's and its upper tail coverts extend over the base of the tail, causing a sawed-off appearance.

Coturnix possesses a longer, thinner, pointed bill that grows more rapidly than the blunt bill of bobwhite. The crest is lacking in Coturnix, which also walks and squats on a more horizontal plane. It somewhat resembles a small meadow lark, and when feeding squats or moves very closely to the ground.

The flight, too, is considerably different. The bird flushes at low angle, much like a meadow lark, rises to about 10 feet, and flies with wings flailing until it drops. The glide of bobwhite seems to be missing, and flight distances of a quarter of a mile are common. The thunderous take-off of bobwhite is replaced

by a rather soft squealing sound as *Coturnix* takes wing; it resembles the take-off and flight of small rails.

The male *Coturnix* appears to be the most vocal, his main call being a rapid, harsh rattle similar to the long rattle call of meadow larks. The birds give this call at all hours, most heavily at dawn. When resting and feeding they occasionally make a sound that can hardly be distinguished from a soft-calling cricket. A squealing, excited call is often given as the birds are flushed.

Coturnix is a ground nester, but does not show a high degree of nest construction, often using a small depression in the ground, with the eggs exposed from above. At times nests are under overhead cover, but little effort is made to form much of a canopy.

Eggs of well-fed birds are about the size and shape of bobwhite's, having a base color of pale olive, light gray or tan, and are speckled lightly or heavily blotched with brown. Coloration is far from uniform. The ground nests we have studied have all held clutches numbering 8 to 12 fertile eggs.

Sexing birds by plumage markings can be easy or difficult, depending upon the degree of development. *Plumage markings apparently are no definite age criteria in Coturnix quail.* Throat patterns generally hold the key to determining sex. Hens possess buff chin and throat features, flecked with black, after the juvenile molt.

The male throat plumage shows quite a variation. Some young males possess throat patterns similar to the female, except for a narrow brown stripe running down through the center of the throat. If even the faintest sign of a dark stripe is present, the bird is generally a male. Most young males acquire a light chocolate brown throat around 4 weeks of age.

At 8 to 9 months of age all sexes (during 1956) showed a definite *second-year molt* on the throat prior to the spring production season. In hens, this molt was followed by feather replacement quite similar to the regular female plumage. The male acquired throat feathers varying from light buff to chocolate brown to nearly black. Distinguishing sex after this molt was no problem.

COMPARATIVE METHODS OF OBTAINING FUR CATCH DATA

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Alabama is today the only state that requires all furs to be tagged before they are marketed. It is true that Louisiana requires a severance tax on furs shipped from the state and some other states require tags on special furs—such as beaver. Alabama, however, requires the trapper to place a different priced tag on each kind of pelt before it is sold.

The tags are sold only by the Probate Judges of the various counties. Their books are open for inspection and reports of sales are usually made to the Department of Conservation each month. Tags vary in price from 1¢ for an opossum to \$1.00 for a beaver. They are supposed to be purchased by the trapper and put on the pelt before it is marketed. Such a system, in theory, allows the Department to know how many furs are being marketed each year. This system initiated in 1951-52 replaced an earlier tag law that was a revenue measure only.

At the end of the 1953-54 trapping season a questionnaire system of the study of fur harvest was initiated under the Federal Aid in Wildlife Restoration Act. District Biologists obtained the names and addresses of the licensed trappers from the Probate Judges and at the same time obtained the number of fur tags sold during the season. All of the listed fur-catchers were sent a questionnaire. Of course, there were those with improper addresses that could not be reached; but twenty-eight per cent of all licensed trappers responded.

In 1954-55 the same list was used to again contact the fur-catchers. Many of them reported that they had not purchased a license in that year. Later