

to Florida. And they stop by again in February and March on their way back home.

Since it is not quite fair to charge a non-resident \$15.00 or \$20.00 to hunt pen-raised game, many states now have special non-resident licenses, applicable only on shooting preserves, at reduced rates. The most popular charge among state game commissions, preserve operators and sportsmen is a non-resident fee of \$5.00. This entitles the hunter to shoot on any preserve during the preserve season. Only released species may be harvested.

I feverently plea that state game commission personnel make a definite effort to study and understand shooting preserves. We should all be patient with the operators. No two preserves are alike; because one may not be appealing, we should not judge others without knowing first-hand what their standards are. Regardless of any early failings, the shooting preserve operator is a person who is desperately trying to provide a place for sportsmen to hunt. He generally realizes his weaknesses and is trying to overcome them. He knows he must please the hunters or go out of business.

The shooting preserve operator should be encouraged, befriended and assisted. The operator is trying to provide hunting on an intensive scale on a small area which is impossible to achieve with wild game. Aside from the fact that he is trying to make a dollar, the preserve operator is a brave spirit venturing into a relatively new field in the South and we should all be pleased that private enterprise is contributing this assistance.

Regardless of our personal feelings, shooting preserves are here to stay. No one claims that they will solve our many problems. But shooting preserves are one approach that achieves results and a partial solution to hunting pressure. With the national population growing at the rate of 3,000,000 a year, hunters need all the help they can get from every source.

MOURNING DOVE NESTING STUDIES IN MISSISSIPPI

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For years most sportsmen and personnel of wildlife management agencies throughout the country have failed to recognize the importance of the mourning dove as a major game bird species. However, in recent years this trend of thought has gradually changed as sportsmen and administrators alike have endeavored to learn more about the habits of this sporting bird. As examples of this changing trend, we cite the Cooperative Dove Study of the Southeastern states, the popular writings in the hunting publications, public pressure to open states to dove hunting that for years have been closed and the tremendous increase in the number of hunters pursuing this shooting sport. Possibly, importance of the dove as a game bird was indelibly stamped on the minds of most wildlife administrators in the Southeast with the outbreak of the dove disease, *trichomoniasis*, so prevalent a few years ago, and with the severe lowering of the population as a result of the spring ice storms of 1951.

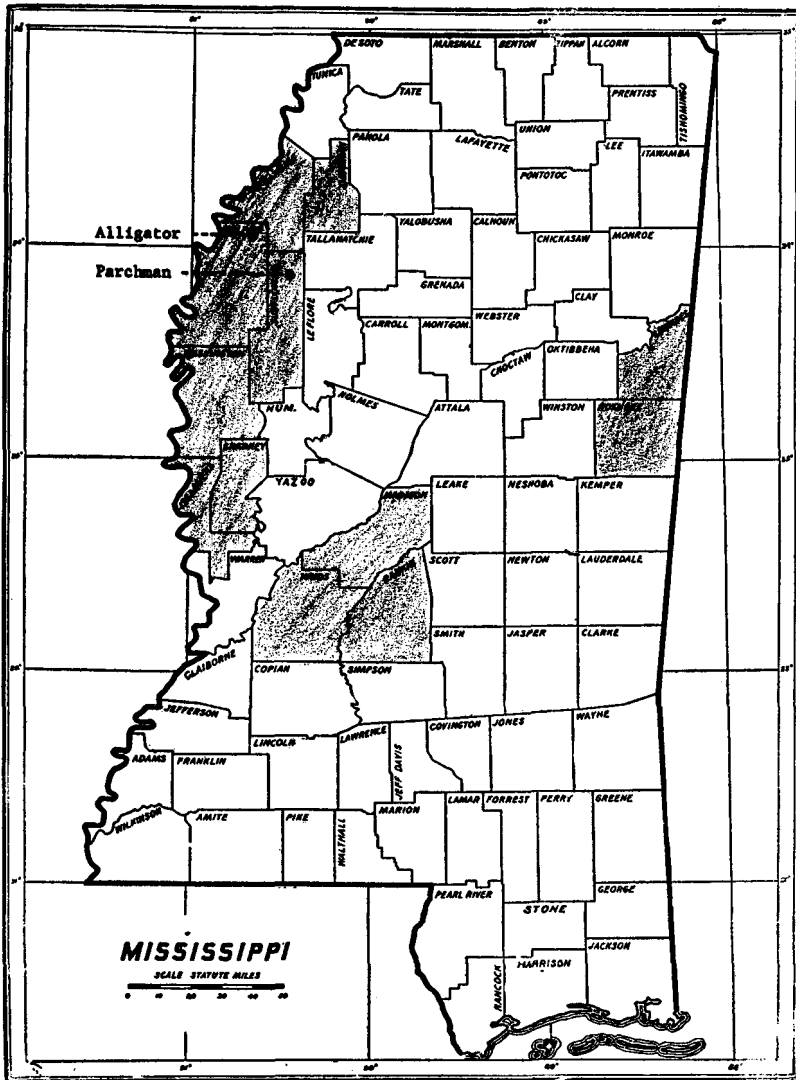
A most important emphasis was added to the study of the mourning dove with the initiation of the five-year cooperative dove nestling banding program in 1955. The authors believe that the nestling banding program will obtain more results than any other phase of banding or census work because age and

* Grateful acknowledgment is made to H. Bobbs, Jr., S. C. Thompson, B. C. Johnson, E. W. Coleman, G. Bailey, E. W. Sloan, J. B. Kelley, L. R. Duvall, F. Crosby, and G. Coleman, of the Mississippi Game and Fish Commission, and to N. C. Hutcheson, B. L. Webster, and R. R. McMasters, of the U. S. Fish and Wildlife Service, for their assistance in the dove banding program. Without their cooperation, the high number of bandings could not have been possible, nor could the dove nest tagging study have been complete.

origin of the banded birds is definitely known. In 1950, prior to the initiation of the nestling banding program, Mississippi Dove Study Leaders Bobbs and Thompson repeatedly urged U. S. Fish and Wildlife Service administrators to adopt a nestling-banding program, rather than continue adult banding, to achieve the results now sought. During this period from 1948 until 1956, a total of 703 nestlings was banded in Mississippi.

Since little emphasis was placed on the nestling banding program in 1955, little nestling banding was done in Mississippi until last year. During the 1956 nesting season, a total of 1,503 mourning dove nestlings was banded in Mississippi by personnel of the Game and Fish Commission and the U. S. Fish and Wildlife Service. During the 1957 nesting season a total of 2,518 nestlings was banded by these personnel.

1957 NESTLING BANDING AREAS



DESCRIPTION OF NESTLING BANDING AREAS

To date in the current five-year banding program, we have banded dove nestlings in twelve counties principally in the northern half of the state. These counties are shown on the attached map and are listed as follows:

Hinds, Madison, and Rankin in the central pine-hardwood section of the state; Noxubee and Lowndes in the prairie section; and, Quitman, Coahoma, Sunflower, Bolivar, Washington, Sharkey, and Issaquena in the delta section.

In the central section of the state nestlings have been banded principally in oak and pine trees. In the prairie section osage orange and cedar have been the principal nesting locations, while in the delta section nestlings have been banded in peach orchards, pecan orchards, a pine plantation, a locust and ash plantation and in various species of oaks.

The major banding areas in which accurate records of nesting success have been kept have been the Mississippi State Penitentiary at Parchman in Sunflower County and at an area near Alligator in Bolivar County. Both of these areas are located in the delta section of the state.

At Parchman most of the nestlings banded have been located in two peach orchards, a pine plantation, and an ash and locust plantation. (Nesting preference has been found to be in the order nesting locations are listed.) The peach orchards are forty and sixty acres in size. They both contain several varieties of early and late-bearing peaches. The trees are planted on twenty-foot squares and they average ten feet in height. Since peaches produced on the area furnish fruit for most of the state institutions, the orchards are well kept. The orchards are regularly cultivated and the trees are annually pruned and periodically sprayed. The fruit is harvested as it ripens.

The pine plantation on Parchman contains only slash pine and is approximately five acres in size. The trees average twenty-four feet in height and are planted on six-foot squares. The trees are annually pruned. Annual growth is slow when compared with normal Southern pine-growing regions.

The ash and locust plantation is also approximately five acres in size. Ash is apparently not adapted to the region as growth is extremely slow and die-off of trees in the area is heavy. At present the trees are only ten feet in height. The few locust in the plantation exhibit spindly growth, and at present are twenty feet in height.

In addition to the nestlings banded in the three tree types listed above, a few (less than fifty) were banded in ground-nest locations. Most of these were banded in the peach orchards on stumps where the trees had been removed or on the ground at the previous tree site. The remainder banded on the ground were found in previously disced weed fields adjacent to the peach orchards. Restrictions in personnel and time prevented any concentrated effort to locate nests in tomato and cotton fields although they were reported to be present in these situations.

The area referred to as the Alligator Area is a pecan orchard containing less than fifty trees. The trees average fifty feet in height and have been planted and grown in compliance with accepted orchard practices.

Although the size of the Alligator Area is comparatively small, nesting activity has been phenomenal. Some of the trees contained as many as five and six nests, and one tree contained seven. On several occasions three active nests were located in one tree. Several nests during the course of the summer were found to contain three and four eggs.

ANALYSIS OF THE DOVE NEST TAGGING SYSTEM

In conjunction with the nestling banding projects, a dove nest tagging system was initiated in Mississippi this year by the authors. The tagging system was designed to determine more about nesting activity, nest destruction, nest abandonment, number of eggs laid, loss of eggs and young birds, and nesting success. The tags, in addition to aiding in determining the above information, also proved valuable in relocating nests once they had been found.

The tags used in the system this year were yellow, weather-proof cards measuring three inches by six inches. A re-enforced hole for use in tying was

placed in one end of the tag, and the tag was perforated in the center. The top half of the tag contained the following information when completed:

Nest Number—Date Nest Tagged—Date Doves Banded.

The lower half of the tag contained the following information:

Nest Number—Date Nest Tagged—Number of Eggs—Date Doves Banded—Number Doves Banded.

As the nests were found, a consecutively numbered and dated tag was placed on the tree in a conspicuous location. The number of eggs in the nest was noted on the lower half of the tag. On the subsequent visit to the nest, after nearly as possible a ten-day interval, the nest was again checked and additional notations were made. If nestlings were present, they were banded and the date, number of birds banded and band numbers were noted on the tag. The lower half of the tag was then torn off and filed for later reference. If no birds were present, notations as to the apparent history of the nesting attempt were made on the lower half of the tag, and it was also filed for later incorporation into the nesting analysis.

At the beginning of the current nesting season, the use of tags was initiated on five areas. Limited nesting in two areas prevented a satisfactory use of the tags, and, in a third area, follow-up of the tags by wayward youths resulted in the destruction of some nests, so therefore, use of the tags necessarily had to be halted. However, the system was carried out very successfully on the Parchman and Alligator Areas. Tabulation of nesting data derived from these two areas appears below. However, it should be pointed out that this information by no means constitutes the complete data that can be derived from a study of the tags. Considering that nesting continued through the month of September, little time remained prior to the preparation of this paper for a thorough study of the data on hand.

Banding began on the Parchman Area on April 24. On that date 21 nestlings were banded and 72 nests were tagged. The nest tagging peak of 213 was reached on July 16, followed by the first peak banding of 176 nestlings on July 29. On August 12, 182 nests were tagged followed by the major peak banding of 204 nestlings on August 23. Following this date there occurred a rapid decline in nesting activity.

On the final visit to the area on September 30, it was discovered an unsolicited dove shoot had been held in the pine plantation where the remaining nesting activity on the area was occurring. As a result of this shooting, no live nestlings were found, although three abandoned nests with eggs were located. Graph I illustrates the rise and fall in nestling bandings and nest tagging on the Parchman Area.

During the nesting season a total of 1,615 nests were tagged on the Parchman area. Of this number, 1,336 (82.1 percent) were relocated and checked on subsequent visits and tag stubs filled out and recorded for them. In the total of 1,336 nests, 363 nests (27.1 percent) were found empty on follow-up visits. For purposes of analysis, these empty nests were counted neither as successful nor unsuccessful nesting attempts, since in the time lapses involved either could have been possible.

In determining known production, it was necessary to eliminate the number of empty nests (363) as well as the number of nests lost (279) from the total number of nests found. This subtraction leaves a total of 973 nests in which production is known. A total of 52 nests (5.3 percent of the 973 nests) was found to be abandoned; 89 nests (9.1 percent) were found destroyed on subsequent visits. Total observed mortality in the 973 nests amounted to 27 nestling birds.

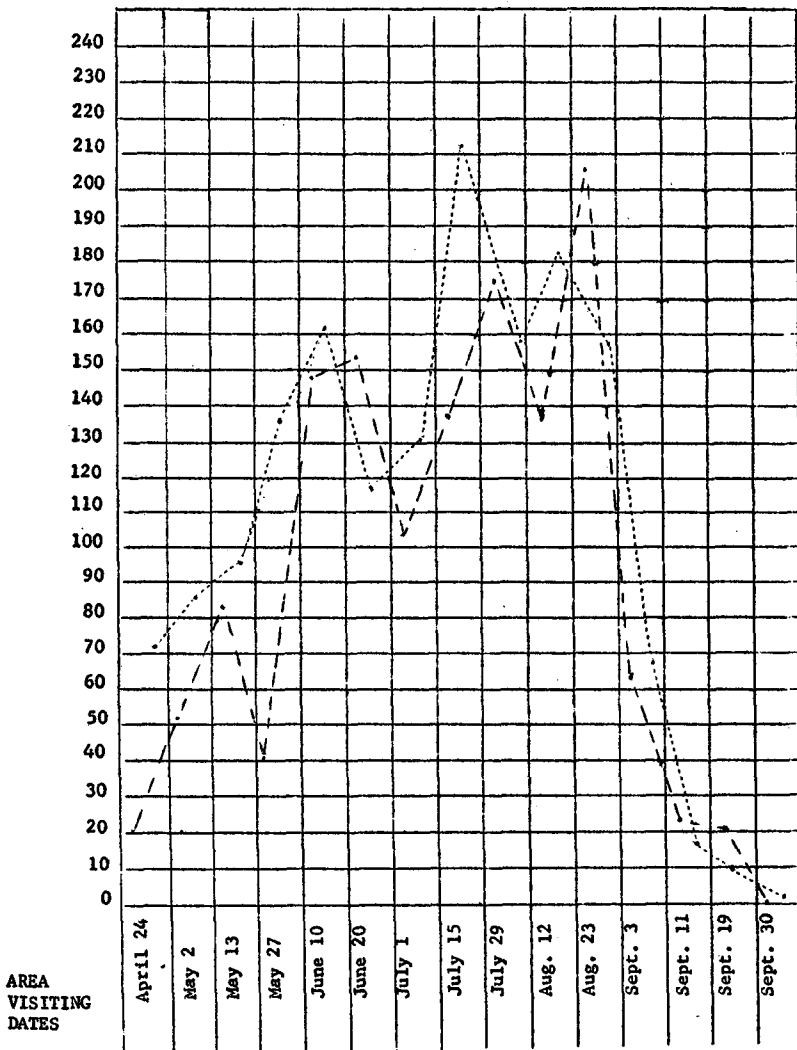
In the 973 nests, 731 were found containing eggs. The remaining 242 nests contained young which were banded on the first visit. The 731 nests containing eggs yielded a total of 1,362 accountable eggs. From these eggs a total of 971 young was hatched that were banded on later visits. This banding shows a 71.2 percent successful hatch from the accountable eggs. The 28.8 percent mortality figure is comprised of unhatched eggs, abandoned nests, destroyed nests, and dead birds found in nests.

Adding the total of 971 birds banded from eggs to the total of 405 birds found in 242 nests on original visits reveals a total of 1,376 nestlings banded

GRAPH NO. 1

NESTLING BANDING AND NEST TAGGING ACTIVITIES
PARCEMAN AREA - 1957

..... Number nests tagged
- - - - - Number nestlings banded

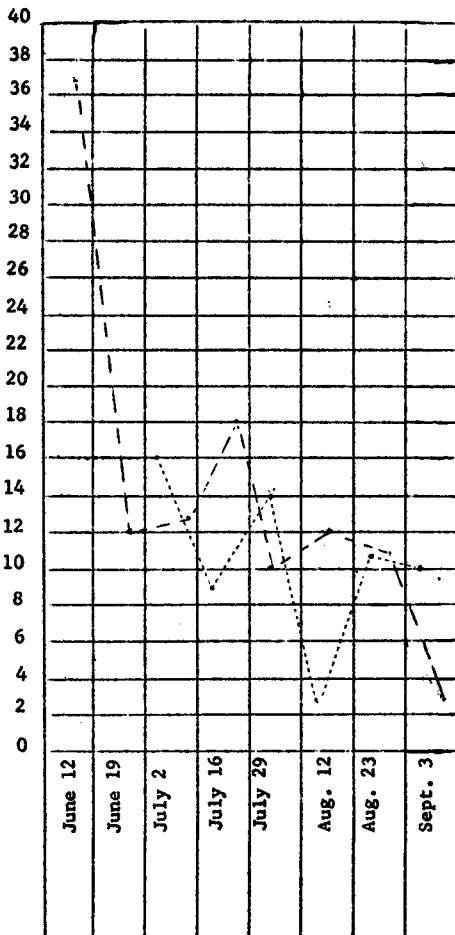


GRAPH NO. 2

NESTLING BANDING AND NEST TAGGING ACTIVITIES

ALLIGATOR AREA - 1957

----- Number Nests Tagged
..... Number Nestlings Banded



AREA VISITING DATES

at Parchman from a total of 973 nests indicating a production ratio of 1.41 birds per nest.

Banding began on the Alligator area on June 12. On that date 16 nestlings were banded and 37 nests were tagged. The nest tagging peak of 37 was reached on that date, and for the first three visits to the area, the nestling banding remained at a peak of 16 birds. The final visit was made to the area on September 3 at which time 10 nestlings were banded and three new nests were located. Graph II illustrates the peak and fall of nestling bandings and nest tagging on the Alligator area.

During the nesting season a total of 116 nests was tagged on the Alligator area. Of this number 96 (82.8 percent) were relocated and checked on subsequent visits and tag stubs filled out and recorded for them. In the total of 96 nests, 34 nests (35.4 percent) were found empty on follow-up visits. For purposes of analysis, these empty nests were counted neither as successful nor unsuccessful nesting attempts, since in the time lapses involved either could have been possible.

In determining known production, it was necessary to eliminate the number of empty nests (34) as well as the number of nests lost (20) from the total number of nests found. This subtraction leaves a total of 62 nests in which production is known. A total of 4 nests (6.4 percent of the 62 nests) was found to be abandoned; 4 nests (6.4 percent) were found destroyed on subsequent visits. No mortality of birds was observed in the study.

In the 62 nests, 46 were found containing eggs. The remaining 16 nests contained young which were banded on the first visit. The 46 nests containing eggs yielded a total of 94 accountable eggs. From these eggs a total of 69 young were hatched that were banded on later visits. This banding shows a 73.4 percent successful hatch from the accountable eggs. The 26.6 percent mortality figure is comprised of unhatched eggs, abandoned nests and nests destroyed.

Adding the total of 69 birds banded from eggs to the total of 26 birds found in 16 nests on original visits reveals a total of 95 nestlings banded at Alligator from a total of 62 nests, indicating a production ratio of 1.53 birds per nest.

Table I, Analysis of Parchman and Alligator Mourning Dove Nestling Banding, shown below supplies the aforementioned data in tabular form:

TABLE I
ANALYSIS OF PARCHMAN AND ALLIGATOR MOURNING DOVE NESTLING BANDING

	<i>Parchman</i>		<i>Alligator</i>	
	Number	Percent	Number	Percent
Total Nests Tagged	1,615	...	116	...
Nests Lost	279	17.9	20	17.2
Nests Relocated	1,336	...	96	...
Nests Empty	363	27.1	34	35.4
Production Nests	973	...	62	...
Nests Abandoned	52	5.3	4	6.4
Nests Destroyed	89	9.1	4	6.4
Nestling Mortality	27	...	0	...
Nests w/Eggs	731	...	46	...
Nests w/Birds	242	...	16	...
Accountable Eggs	1,362	...	94	...
Immediate Banded Birds	405	...	26	...
Birds Banded from Accountable Eggs ...	971	71.2	69	73.4
Total Nesting—Mortality	28.8	...	26.6
Total Birds Banded	1,376	...	95	...
Egg Production Ratio	1.4:1	...	1.4:1	...
Nest Production Ratio	1.4:1	...	1.5:1	...

In summation the authors believe that the continued use of the dove nest tagging system, with some revisions, will aid in shedding light on several factors of dove nesting now apparently taken for granted through universal assumption. Among these are nest mortality, nest abandonment, nest destruction, number of nesting attempts, period of time nestlings remain in the nest and degree of nesting success in various types of habitats.

In the event other agencies contemplate undertaking a nest tagging system, several factors should be taken into consideration. Most important is the selection of interested personnel for the banding operations. Primarily they must be interested in dove banding and be schooled in the importance of nestling banding and the preparation and record keeping necessary both in the banding and tagging system. In carrying out a banding or tagging program, the nesting areas should be visited at least once every seven days. Our experience indicates that in longer intervals nestlings will hatch and leave as indicated by droppings found in nests. More frequent trips will also eliminate the use of elastic tape on birds that are too young to satisfactorily band. The number of lost tags or nests can be reduced considerably if the tags are securely fastened to the trees in conspicuous locations by use of nylon cord or large-head-roofing nails.

CONCLUSION

In conclusion, the authors feel the cooperative mourning dove nestling banding program is the most important dove study project yet undertaken and will bring out many factors to facilitate management of this species. Not only will the program directly benefit the species under consideration, but it will greatly add support to the cooperative efforts of State and Federal agencies working on a problem important to both.

A PRELIMINARY REPORT FROM THE SOUTHEASTERN COOPERATIVE DEER DISEASE STUDY¹

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Authoritative sources indicate that shortly following the Civil War a major disease disaster occurred among the deer (*Odocoileus virginianus*) of the southeastern United States. This die-off encompassed a wide area and mortality reached serious proportions. State and Federal files show that similar outbreaks have been occurring in the Southeast since 1890 (Foote, 1955). During the fall of 1949 losses were very high and ninety percent of the entire deer population of one area succumbed to a condition of undetermined origin (Holland, 1957). In September and October of 1955 several eastern states reported that field personnel had observed an abnormally high number of dead deer on certain localized areas (Foote, 1955), and since this time sporadic losses have been recorded from a number of herds (Cannon, 1957). Although the last major deer disease outbreaks in the Southeast were in 1955 (Table I), at present conservationists are concerned with the possible and highly probable reoccurrence of so-called "blue-tongue, black-tongue, hemorrhagic septicemia," or other conditions of undetermined origin.

Many proposals have been offered regarding the reason(s) for each deer die-off; however, it has been seldom that a confirmed laboratory diagnosis was made. This has not been the fault of either the state agencies or the laboratories involved. The greatest single reason for the present dearth of information on deer diseases of the Southeast can be explained in that no one state has been justified in maintaining a full time diagnostic and research service, for the sole purpose of working with deer. This was not economically feasible nor even practical; therefore, most deer disease investigations in this area have been a "hit-and-miss proposition." In considering the numbers of necropsies (P. M.) relative to total deer losses encountered in 1955 (Table I), this past inadequacy becomes more apparent.

In 1949 the U. S. Forest Service and representatives of the Southeastern Association of Game and Fish Commissioners suggested the need for a co-

¹ This organization is supported through the joint efforts of the Southeastern Association of Game and Fish Commissioners, the Fish and Wildlife Service (P-R Act) and the University of Georgia.

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³ Research Assistant and Laboratory Technologist, *Ibid.*

⁴ Assistant Professor and Project Director, *Ibid.*