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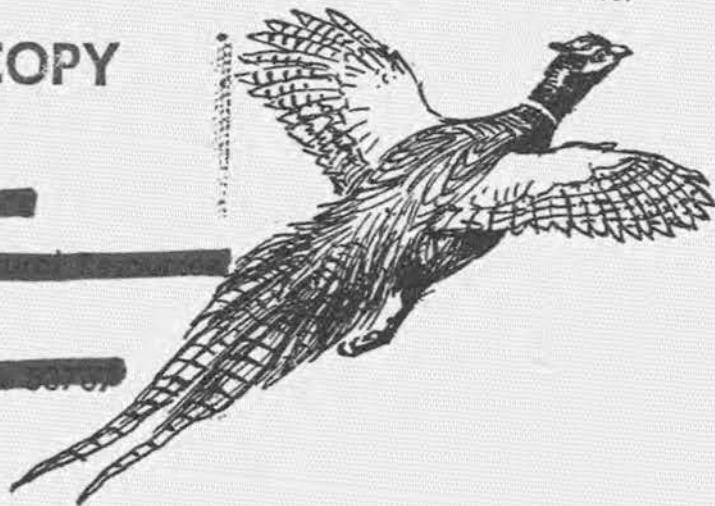
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**TECHNICAL BULLETIN NUMBER 24
WISCONSIN CONSERVATION DEPARTMENT
Madison 1, Wisconsin**

and

**SPORTSMEN'S SERVICE BUREAU
250 East 43rd St., New York, N. Y.**

1962

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LICENSED SHOOTING PRESERVES IN WISCONSIN

by

George V. Burger

Field Representative

Sportsmen's Service Bureau

TECHNICAL BULLETIN NUMBER 24

WISCONSIN CONSERVATION DEPARTMENT

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For their active encouragement and assistance, I am indebted to the following: Robert A. McCabe, who inspired and guided this project, and who provided advice and unfailing assistance in the field and during the preparation of the manuscript; Joseph J. Hickey, for his advice during many phases of the study, and for critical reading of the manuscript; William Field, Frederic H. Wagner, and J. R. Smith, all of the Wisconsin Conservation Department, for their suggestions and assistance, and for granting me access to the shooting preserve files of the Conservation Department; the shareholders of the Bark River Game Preserve, Inc., for their generous support; and the shooting preserve licensees of Wisconsin, for their active co-operation during the state-wide survey.

The Sportsmen's Service Bureau, a division of the Sporting Arms and Ammunition Manufacturers' Institute, appreciates the opportunity to join with the Wisconsin Conservation Department in the publication of this booklet.—*James B. Dee, Director, Shooting Development*

Edited by Ruth L. Hine

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INTRODUCTION

Definitions

Shooting preserves have been defined as "any land on which a man is given special permission to hunt" (Schorger, 1955) and, more explicitly, as "privately owned and operated areas on which pen-reared game is released for hunting" (Dickey, 1957). Neither definition mentions that shooting preserves must be licensed by the state in which they exist, and must comply with specific state regulations. Essentially, then, shooting preserves are privately owned areas, licensed by the state, on which some form of liberalized hunting of pen-reared game is permitted.

Hunting areas of this type have been referred to as "licensed game bird clubs" (Hart, 1957) and "regulated shooting grounds" (Sullivan, 1958). The term "shooting preserve" was used in the first state laws and literature on the subject, and has become standardized in many states as well as in most of the modern literature (Dickey, 1957).

Hunting carried on at shooting preserves has been called regulated shooting, fee hunting, and put-and-take shooting. Perhaps the best term, and one that is widely used in the literature, is "controlled shooting" (Olin Mathieson Chem. Corp., 1957).

History

Shooting preserves had their origin in the eastern and southern hunting clubs of the early 1900's. Palmer (1910) pointed out the growing need for licensing and regulating these clubs and outlined a series of regulations that might prove necessary in the future. In the same year, New York became the first state to license shooting preserves. The New York legislation, and that of most of the states to follow, fulfilled Palmer's predictions almost to the letter.

Since 1910, licensed shooting preserves have increased greatly in number and distribution. By 1960, 41 states licensed preserve operations, and an estimated 1,500 commercial and private establishments were in existence. Much of this growth occurred within the past 20 years. Illinois and California, for example, did not license shooting preserves until 1939 (Titus and Laycock, 1955; Hart, 1957), and Ohio not until 1951 (Allen, 1956). Growth has not been without some opposition. For various reasons, some sportsmen's groups have opposed the licensing of shooting preserves in several states. Some of the most vigorous reaction came in Michigan, where the preserve system, first

established in 1929, lost its legal status in 1935 (Tubbs, 1946). Michigan reinstated shooting preserve legislation in 1958, however, and nearly 40 preserves were licensed that year.

Several distinct types of preserves have developed in most states, and might be categorized as follows:

- A. Commercial shooting preserves—operated for financial profit.
 1. Fee-hunting operations—open to the public on the payment of a daily fee for hunting or for the number of birds shot.
 2. Subscribing-member operations—restricted to a definite number of hunters, who pay a prescribed membership fee, usually in advance and on an annual basis.
- B. Private shooting preserves—noncommercial operations, not open to the general public.
 1. Clubs—operated and either owned or leased by a group of hunters, who perform their own labor or utilize hired help.
 2. Co-operatives—usually composed of farmer-members, who provide the land, and city-members who provide the funds. Both groups may share in the labor and in the hunting.
 3. One-owner (or lessee) preserves—area licensed to and managed by a single individual, who may hunt alone or with nonpaying guests.

Private operations considerably outnumber commercial preserves (Dickey, 1958). Seventeen of the 21 preserves established in Connecticut between 1933 and 1940 were private (Williamson, 1940). Most of California's establishments are noncommercial (Hart, 1957). Of 103 preserves in Pennsylvania in 1957, only 29 were commercial (Sullivan, 1958).

The ring-necked pheasant (*Phasianus colchicus*) is the most popular species hunted on shooting preserves, but pen-reared mallards (*Anas platyrhynchos*), chukar partridge (*Alectoris graeca*), bobwhite quail (*Colinus virginianus*) and, most recently, coturnix quail (*Coturnix coturnix*) have all been released and hunted on these areas.

Shooting Preserve Regulations

Basic legislation governing preserve shooting is similar in most states. Fundamental requirements are the release of pen-reared game, fixing a percentage of such game that may be shot, payment of a license fee, adequate posting and fencing of boundaries, and a shooting season of fixed duration.

This Study

In 1931 the Wisconsin state legislature passed the Licensed Shooting Preserve Act (Section 29.573 of the Wisconsin Statutes). Since then shooting preserves have been the subject of considerable controversy in Wisconsin (Schorger, 1955). In spite of this controversy, however, no thorough study had been made of the shooting-preserve system as a whole, or of any one preserve, prior to the research project reported here.

The objective of this research was to conduct a detailed field study of existing shooting preserves, and to evaluate the role played by the preserve system in the over-all program of game management in Wisconsin. A two-phase project seemed advisable. The first phase consisted of intensive field research on a single preserve. The Bark River Game Preserve, Inc., in Jefferson County, was chosen as the site for this investigation, due to the willingness of the owners to co-operate, and because this preserve was the largest in the state in acreage and operational activities. This phase of the study commenced in 1954 and continued through June of 1958. Detailed results of this research are available elsewhere (Burger, 1958).

The second phase of the study consisted of an evaluation and analysis of the shooting preserve system as a whole in Wisconsin, and is reported here. In this work, I undertook an examination of the past and present status of preserves, and a survey of preserve habitat, management, hunting, stocking and other operations. I also attempted to establish the motives and problems of preserve operators in Wisconsin.

The Wisconsin Conservation Department provided background material and access to files on licensed preserves. These files contained records of stocking, harvests, and the acreages and locations of all areas licensed since the inception of the preserve system in the state, as well as certain miscellaneous information. I visited 42 operating preserves from 1955 through 1957, and interviewed the licensees or, in a few instances, the farm manager or other parties familiar with the operation. In 4 cases where personal interviews were impractical, I inspected the area to appraise habitat conditions and land use, and secured additional information by corresponding with the licensees. Inspection and interview data were recorded on a standard form in each case.

The 42 preserves inspected comprised 58 per cent of the 72 areas licensed and in operation in 1957. Fourteen of these 72 preserves had been in operation 2 years or less at the time of the study, and were not included in the inspections. Consequently, inspections covered 72 per



The Bark River Game Preserve, Inc., in Jefferson County, is an excellent example of game management on private property, in response to incentives provided by the shooting preserve law. Perennial cover plantings (foreground), extensive food plantings (center), and ungrazed woodland (rear) improve habitat for all game species.

cent of the preserves in existence 2 or more years as of the 1957-58 hunting season. The remaining 16 preserves not visited conducted only limited stocking and shooting activities.

Co-operation from preserve licensees was excellent. Certain types of information were difficult to obtain, however, due largely to a lack of detailed release and shooting records.

LICENSED SHOOTING PRESERVES IN WISCONSIN

The Wisconsin Licensed Shooting Preserve Law

The Licensed Shooting Preserve Act of 1931 authorized the issuance of licenses for pheasant shooting preserves in Wisconsin "when in the judgment of the (Conservation) Commission, operations under such

licenses will result in a net increase in the supply of pheasants in the state and will otherwise be in the public interest." An annual license fee of 5 dollars for areas of 320 acres or less, and of 10 dollars for areas in excess of this acreage, was prescribed. Posting of the licensed area and definition of the boundary by at least one strand of wire was specified. No shooting was authorized until pheasants had been released and such releases certified to by the Conservation Commission. The law required further that pheasants shot on preserves be tagged with a special metal seal (of the boxcar type) supplied by the state at a cost of 5 cents each. Further details were to be subject to regulations as set forth by order of the Conservation Commission, which in turn ruled that preserve operators could harvest a maximum of 75 per cent of the number of pheasants released.

Between 1935 and 1948 the original commission order was revised 6 times, and in 1956 a seventh revision was established as a Wisconsin Administrative Code (Section WCD 19.07). None of the original provisions cited in the law were changed, but the revisions imposed a series of additional regulations (Table 1). Some of these regulations governed the timing and credits for stocking, and the length of the shooting season. More significantly, a series of related restrictions on the size, number and location of shooting preserves was established. These changes apparently reflected the opposition of a portion of the hunting public to the preserve movement.

In 1936 additional preserves were rigidly prohibited in 8 counties. By 1956 this rule had been modified so that any area under 640 acres could be licensed in these counties, providing that the land was posted against public hunting for at least 2 years previously and met certain other requirements. The 1948 provision against the inclusion of wintering grounds was cushioned slightly in 1956. The net result of the revisions was a complex of rules, individually not as restrictive as when first set forth, but in combination capable of drastically curtailing the establishment of new preserves.

Compared to other states, Wisconsin's regulations governing shooting preserves during the period of this study (1955-58) were similar in the shooting credits allowed for under-the-gun stocking, and were less restrictive than some states in matters of boundary fencing and the regulation of hunting. On the other hand, the shooting season allowed in Wisconsin was shorter than in other states; restrictions on size and location were much more detailed and severe than in most states; and the liberal allowance of shooting credits for hen pheasants released in spring was nearly unique. It appeared that public opposition, or the

TABLE 1
The Wisconsin Licensed Shooting Preserve Law and Its Revisions

| Law or Revision | Stocking Policies | Shooting Season | Size (Acres) | Location (General) | Location (Specific) |
|--|---|--|---|---------------------------------------|--|
| The law | Determined and certified by Cons. Comm. ³ | Determined by Cons. Comm. | No Provision | No Provision | No Provision |
| Cons. Comm. Order M-102 (revised) 1935 | Certification by a representative present at release; 3 extra credits for hens stocked Apr. 1-20. | First day of state season to Jan. 31 | Not over 3,000 | No change | No change |
| Same (revised 2) 1936 | No change | First day of state season to Dec. 31 | Not over 640; must be contiguous. | No more in 8 counties ¹ | None within 2 miles of a state game refuge |
| Same (revised 3) 1938 | Spring release must be in ratio of 1M:8F | First day of state season to Jan. 31 | Not over 640 unless O.K.'d by Game Board | Same unless land posted 2 years prior | No change |
| Same (revised 4) 1941 | Spring release ratio not less than 1M:8F | No change | Not over 640 unless O.K.'d by Supt. of Game Mgt. | No change | None within 2 miles of a public hunting ground |
| Same (revised 5) 1942 | Special release certification policy for fee-hunting areas ² | No change | No change | No change | No change |
| Same (revised 6) 1948 | Spring release period: Mar. 1-31; gentle release required in spring | First day of state season to Dec. 31 | None over 640 in a major pheasant county | See size | None where state pheasants stocked within 1 yr.; none including or benefiting from major wintering ground. |
| Wis. Administrative Code; Sec. WCD 19.07, 1956 | Spring release period; Mar. 15-Apr. 15; no credit for birds under 10 wk. old. | Ninety days commencing 1st day of state season | Five per cent posted as un hunted refuge after Jan. 1 | No change | As above, unless in the public interest, as determined by Cons. Dept. |

¹Dane, Green, Jefferson, Kenosha, Racine, Rock, Walworth and Waukesha Counties.

²Warden can certify 50-300 birds at a time, to be leg-banded and released at a later date.

³Conservation Commission.

fear of such opposition, to preserves possibly had influenced conservation authorities in Wisconsin more than in other states. The fact that wintering marshes generally are considered essential to good pheasant populations in the state (McCabe, *et al*, in Allen, 1956) appeared to be reflected in preserve regulations.

Partly as a result of recommendations from this study, and partly due to findings of an investigation of preserve regulations and activities in other states, the Wisconsin Conservation Commission and Department undertook a major revision of shooting preserve regulations in 1959. A summary and discussion of these revisions, under which licensed shooting preserves have operated since 1959, is presented at the conclusion of this report.

Past and Present Status

Preserves existing in the past or at the time of this study included all of the types previously discussed. Eighty-one per cent of the 150 preserves that were licensed in Wisconsin from 1932 through 1957 were owned or leased by a single individual on a private hunting basis (Table 2). Most of the remainder have been or are club operations on owned or leased land. Only 12 shooting preserves ever operated on a commercial basis in Wisconsin. Ten of these preserves either canceled their licenses or changed to private hunting status. The 2 commercial preserves in existence in 1957 were of the subscribing-member type. There were 7 commercial, fee-hunting areas open to the public in the state in 1957, but these were licensed under the game-bird and fur-farm law, rather than as shooting preserves.

One trend in the type of preserve established has been away from commercial operations. No single type of private preserve has become noticeably more popular over the years. A comparison of existing with canceled preserves suggests that clubs, and especially co-operative groups, have shown better-than-average survival. Areas including leased lands appear to have suffered a relatively high mortality.

Over 90 per cent of the preserves licensed since 1932 have been located in the southeastern quarter of the state (Fig. 1). The majority of preserves operating in the past and in 1957 were clustered in 6 southeastern counties, representing some of the better pheasant habitat in the state.

TABLE 2
Types of Shooting Preserves Established in Wisconsin, 1932-1957

| Type | Existing (1957) | | Canceled | | Totals | |
|-------------------------------------|--------------------|-------------|----------|-------------|--------|-------------|
| | No. | Per Cent | No. | Per Cent | No. | Per Cent |
| Commercial (subscribing member) | 2 | 3 | 2 | 3 | 4 | 3 |
| Club (land owned) | 6 | 8 | 3 | 4 | 9 | 6 |
| Club (land leased) | 7 | 10 | 5 | 6 | 12 | 8 |
| Co-operative | 3 | 4 | 0 | 0 | 3 | 2 |
| One owner | 36 | 50 | 34 | 44 | 70 | 46 |
| One lessee | 14 | 19 | 28 | 36 | 42 | 28 |
| One licensee, land owned and leased | 4 | 6 | 6 | 7 | 10 | 7 |
| Totals | 72 | 100 | 78 | 100 | 150 | 100 |

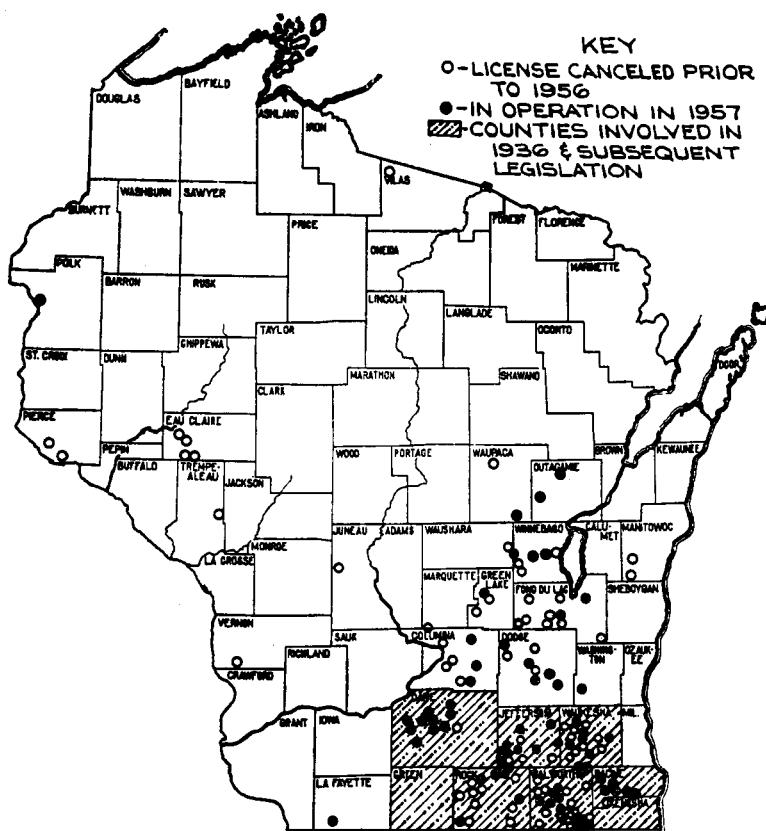


Figure 1. Locations of shooting preserves licensed in Wisconsin from 1932 through 1957. Also shown are eight counties specifically involved in legislative revisions.

New shooting preserves were licensed at a rapid rate from 1932 through 1935. In 1936 the rate of increase dropped sharply, apparently as a result of regulations prohibiting further preserves in 8 counties (Table 1 and Fig. 1). The number of new licenses granted since 1935 was small and relatively constant from year to year, with no more than 8 new preserves licensed in any one year. Cancellations kept pace with new licenses since 1935, with the result that the number of active preserves remained relatively constant, between 60 and 70 each year, through 1957.

The total area licensed to preserves in the state increased at first, as the number of preserves grew, but leveled off in 1936 at a maximum

of 48,000 acres. Minor variations since 1936 resulted in a net decrease in licensed acreage to 36,000 acres in 1957, largely due to revisions in regulations restricting maximum preserve size. Acreage lost as larger, older preserves canceled could not be replaced by newly licensed areas restricted in size. Size changes subsequent to licensing created some of the variations in total annual acreage. Twenty-four preserves decreased in size, 18 increased, and a few areas varied with no net gain or loss while licensed.

Motives for Establishment

I asked the 42 preserve operators interviewed for their motives in applying for a preserve license. Reasons were determined in 8 additional cases from correspondence in the files of the Conservation Department. While expressed motivation may differ from actual reasons, and this fact should be kept in mind, interviewees seemed both frank and willing to explain their motives. Half of the preserves appear to have been established primarily in an effort to provide licensees with more hunting or a place to hunt (Table 3). A hoped-for reduction in trespass problems following posting lands with preserve signs prompted 25 per cent of the license applications. This was true particularly among farmers who belonged to co-operatives or who leased their property to club operations. In some instances, preserves were licensed primarily in an attempt to protect conservation projects and game from poachers. Preserves so motivated frequently operated with little or no stocking and correspondingly little shooting. This inactivity was possible since Wisconsin, unlike most states, required no minimum release of pheasants on its licensed preserves at the time of this study.

Protection from trespass, and refuge motivations, produced the para-

TABLE 3
Motives Given for Applying for Preserve Licenses

| Motive | Number | Per Cent of Total |
|--|--------|----------------------|
| Shooting area for city hunters..... | 16 | 26 |
| More hunting for landowners..... | 15 | 25 |
| Restricting trespass..... | 15 | 25 |
| Conservation and protection of game..... | 12 | 20 |
| Financial profit..... | 2 | 3 |
| Dog training..... | 1 | 1 |
| Totals..... | 61 | 100 |

doxical situation of a law created to further hunting and stocking being used by a few individuals for precisely opposed reasons. In 1957, however, only 3-4 such preserves still were in existence. Several refuge-type operations were converted to state-licensed game refuges (Table 4). The control over hunter trespass that posted preserves are believed to exert remains a popular secondary motive for licensing, however, especially among farmers.

Problems

A portion of the sporting public vehemently opposed the shooting-preserve program in Wisconsin. Schorger (1955) believed that this opposition stemmed from only a few of the sportsmen's organizations in the state, but stated that these organizations were "vocal."

TABLE 4
Motives for Cancellation of 53 Shooting-Preserve Licenses

| Motive Given | Primary Motive | | Secondary Motive | |
|-------------------------------------|----------------|----------|------------------|----------|
| | Number | Per Cent | Number | Per Cent |
| A. Unforeseen management problems | | | | |
| Inability to fence properly | 5 | 9 | 0 | 0 |
| Area unsuitable | 6 | 11 | 1 | 2 |
| Cover lost to cultivation | 3 | 6 | 0 | 0 |
| Club members disagree | 1 | 2 | 0 | 0 |
| Lack of funds | 3 | 6 | 1 | 2 |
| Bird-rearing problems | 1 | 2 | 2 | 4 |
| Predation (fox) too severe | 1 | 2 | 1 | 2 |
| B. Changes in land tenure or status | | | | |
| Licensed area sold | 8 | 15 | 0 | 0 |
| Leasing difficulties | 6 | 11 | 1 | 2 |
| Changed to refuge or game farm | 5 | 9 | 0 | 0 |
| C. Personal problems | | | | |
| Sickness or age of licensee | 4 | 8 | 1 | 2 |
| Death of licensee | 5 | 9 | 0 | 0 |
| Licensee leaves state | 1 | 2 | 0 | 0 |
| D. Legal problems | | | | |
| Actual game-law violations | 2 | 4 | 0 | 0 |
| Failure to stock pheasants | 1 | 2 | 0 | 0 |
| Protesting restrictive laws | 0 | 0 | 1 | 2 |
| E. Public-relations problems | | | | |
| Difficulties with poachers | 0 | 0 | 3 | 6 |
| Public opposition | 1 | 2 | 1 | 2 |

Opposition in the past took the form of public hearings over proposed new preserves, letters of protest to the Conservation Department and Commission, and formal statements published by a few sportsmen's groups. Most of the protests came in the early 1930's, before the establishment of restrictive clauses in the preserve regulations, and before the nation-wide growth in preserve shooting, but at least one public hearing was held as late as 1947. The 1936-1956 revisions in regulations previously described apparently came in response to this reaction by a portion of the public, and to a desire to see that the expansion of private shooting preserves would not be unlimited.

By 1957 it appeared that most of the opposition had subsided. Twenty (48 per cent) of the preserve licensees interviewed stated that they had experienced adverse public relations in the past. Several suffered from severe poaching by hunters who formerly had used the area licensed. At least 3 operators stated that their marshlands had been fired on the closing day of state open pheasant seasons. Only 6 of these licensees still had difficulties with the public at the time of interviewing, however. These problems all involved poaching, which very probably cannot be construed as "opposition" by the public.

Half of the licensees apparently never encountered noticeable reaction to their preserve operations. Most of these preserves were established in the last 10 years, and/or on lands long closed to public hunting, where the licensee was owner-in-residence. Some operators who had experienced opposition in the past attributed the present lack of trouble to the shooting provided local hunters and neighbors by the straying of preserve-released pheasants. Some licensees were leaders in local conservation clubs and believed that their explanations of preserve operations led to a better local understanding of preserve shooting. In several cases preserve licensees annually sponsored social events for the neighbors or for farmers from whom preserve lands were leased, or permitted neighbors to hunt some pheasants or other game species on the preserve.

Reasons given for 53 license cancellations provided some clues to the problems of shooting preserve licensees (Table 4). Most reasons could be assigned to one of three categories. First, unforeseen problems that later became impossible to handle (37%). These problems included inability (through lack of funds, manpower, or the nature of the terrain) to properly delimit an area with the required single strand of wire, lack of money to purchase pheasants for stocking, failure of rear-

ing programs, and establishment of preserves in areas unsuited for pheasant management.

A second major series of cancellations (36 per cent) developed from problems of land title, including the sale of areas formerly licensed as preserves, as well as difficulties in negotiating the renewal of leases. Areas transferred to game-farm or game-refuge status also are placed here.

A final important category included licenses cancelled (19%) due to sickness, old age or death of the licensee.

Public-relations problems apparently contributed to only 5 cancellations. Two actually resulted from direct public opposition, which was the primary motive in only one case. Restrictive regulations were cited only once, and then as a secondary factor.

Local operational problems, personal health and changes in land title obviously were the important motives for the majority of past license cancellations. Public opposition and restrictive regulations, probably responsible for the reduced number of new applications, apparently did not cause many cancellations.

Most cancellations took place within one to four years after licensing, probably related to the appearance of the operational problems cited above.

Preserve Operations

Stocking

During the 25-year period from 1932 through 1957, licensed shooting preserves in Wisconsin released at least 171,362 pheasants. This is a minimum figure, since a number of preserves regularly liberate pheasants over and beyond the number that they report and for which they request stocking credits. Of this total, 11,501 were not distinguished as to sex when reported. Hens comprised 52 per cent of the remainder.

Reported spring releases totaled 33,514 birds. Regulations during the study period (Table 1) required that all spring liberations must be carried out through the "gentle-release" method described by Buss (1946). An analysis of the season of release used on the 69 preserves stocking in 1956 revealed that 37 preserves used spring releases exclusively that year, and 9 others released birds in spring as well as in other seasons (Table 5).

Summer (mid-May through August) releases largely had been abandoned since 1956, when the new Administrative Code refused credits for stocking birds under 10 weeks of age. None of the preserves stock-

ing in 1956 reported summer releases, although 33 had liberated pheasants in summer at some time in the past (Table 5).

Fall stocking (arbitrarily defined here as from September 1 to the opening of the shooting season in mid-October) was utilized less than any other form. Only 15,935 pheasants were reported to have been liberated at this time. Only 2 preserves used fall stocking in 1956, although 31 preserves occasionally had done so in previous years.

Fifty-four per cent of the reported releases between 1932 and 1956 were made during the hunting season. The bulk of the unreported stocking occurred at this time as well. Many more pheasants were liberated during the hunting season than in spring, but more preserves utilized spring stocking than they did releases during the season (Table 5).

The timing of releases in 1956, as compared to timing used in the past on the same preserves, showed a trend toward spring and/or "under-the-gun" stocking and away from summer and fall releases. About the same number of preserves changed from spring liberations

TABLE 5
Time of Stocking Used in the Past and at Present
on 69 Shooting Preserves Active in 1956

| Time of Stocking | Number Using in 1956 | Timing Used in Past on Same Areas | | | | |
|--------------------------------|----------------------|-----------------------------------|--------|------|----------------|---------------------------|
| | | Spring | Summer | Fall | Hunting Season | Spring and Hunting Season |
| Spring only----- | 37 | (13) ¹ | 17 | 15 | 15 | 9 |
| Summer only----- | 0 | - | - | - | - | - |
| Fall only----- | 2 | 1 | 1 | (0) | 1 | 1 |
| Hunting-season only----- | 21 | 13 | 12 | 12 | (2) | 7 |
| Spring and hunting season----- | 9 | 1 | 3 | 4 | 2 | (3) |
| Totals----- | 69 | 15 | 33 | 31 | 18 | 17 |

¹Figures in parentheses indicate preserves that have never used release times different from those used in 1956.

to hunting-season releases as vice versa. However, all but 2 of the 21 preserves using hunting-season stocking exclusively in 1956 had stocked at other seasons in the past, while 13 of the 37 areas employing spring releases in 1956 had never experimented with stocking other than in the spring.

To supplement this information, preserve licensees interviewed were

asked to evaluate the release methods they had used over the years. All seasons of release were represented in the sample. Evaluations appeared to be based primarily on the quantity of shooting obtained. Because only a few licensees leg-banded released birds, the opinions given could not be verified by known returns. Regardless of this lack of direct evidence however, the reasons for use given were those that prompted the choice of release type, and therefore were important.

Eight of the 15 operators using spring releases exclusively at the time of interview stated that this method gave them satisfactory shooting in the fall, without additional stocking during the hunting season. Seven others simply said that spring liberations gave them the most stocking credits for their money. Three operators felt that wilder, sportier birds resulted from spring releases, but this was never a primary motive for use.

Nine licensees had once used spring releases but had abandoned this policy. Two of these operators would have employed spring stocking still, but were prevented by the flooding of their lowland preserves in spring. The remaining 7 had given up spring liberations because they felt that they derived little or no shooting from such releases.

All operators employing hunting-season releases at the time of interview said that they did so to insure good shooting. Two clubs switched from hunting-season to spring liberations when the increasing age of their members curtailed hunting pressure and resulted in less need for large numbers of birds.

The majority of preserve licensees appeared to employ spring stocking in order to benefit from the extra credits allowed (Table 1), *if and when* sufficient shooting was encountered without hunting-season releases. When good shooting did not follow spring liberations, operators either abandoned this method in favor of under-the-gun releases, or stocked in both seasons, in which case spring releases provided the shooting credits and hunting-season releases provided the birds for shooting.

Only 5 (12 per cent) of the 42 preserves that were inspected stocked birds that they reared on the premises. The remainder purchased pheasants from various commercial game farms at the time of release or shortly before. Eight operators stopped rearing their own birds because it was less expensive to purchase mature pheasants.

Experiences with stocking and rearing pheasants at the Bark River Preserve, site of the intensive phase of this study, were similar to those of most licensees interviewed. Spring and summer releases were abandoned at Bark River because only hunting-season stocking consistently

provided satisfactory shooting. The owners gave up a large-scale rearing program in favor of purchasing nearly mature birds.

Harvest

From 1932 through 1956, Wisconsin licensed shooting preserves reported the harvest of 89,260 pheasants, or 52 per cent of the 171,362 birds reported released. Cocks outnumbered hens in the harvest by 58 to 42 per cent. In spite of the fact that more hens than cocks were stocked, this 3:2 ratio probably reflects hunter selectivity for cocks. A similar selectivity was apparent during the Bark River preserve study.

An analysis of past records of the 71 preserves actively stocking and shooting in 1957 (Table 6) showed that preserve licensees using spring releases, or a combination of spring and hunting-season releases, got

TABLE 6
Harvest as a Percentage of Birds Stocked on 71 Preserves¹

| Percentage of Release Harvested | Time of Release | | | | | Totals |
|---------------------------------------|-----------------|-------------|------|------------------------|--|--------|
| | Spring | Sum- mer | Fall | Hunt- ing Season | Spring and Hunting Season ² | |
| 0- 15----- | 3 | 1 | 0 | 0 | 0 | 4 |
| 16- 30----- | 0 | 3 | 0 | 3 | 1 | 7 |
| 31- 45----- | 2 | 2 | 1 | 7 | 1 | 13 |
| 46- 60----- | 5 | 3 | 2 | 6 | 2 | 18 |
| 61- 75----- | 9 | 0 | 0 | 1 | 7 | 17 |
| 76- 90----- | 2 | 0 | 0 | 0 | 2 | 4 |
| 91-105----- | 4 | 0 | 0 | 0 | 0 | 4 |
| 106-120----- | 4 | 0 | 0 | 0 | 0 | 4 |

¹Includes harvest and stocking records for all years since licensed, on the 71 preserves in active operation in 1956 and 1957.

²Releases about equally divided between spring and hunting season.

the best returns for their stocking investment. Summer liberations gave the lowest returns, and were little used even before the elimination of credits for young birds released in summer.

Only a fraction of the shooting preserves ever employed leg bands to identify released pheasants, and it was impossible to determine what percentage of the birds released was represented in the total harvest. Some preserves provided limited records from past banding operations which, when combined with Bark River preserve results and with material gathered by Buss (1946), gave some clues to the nature of the harvest (Table 7). In these samples the best recoveries came from hunting-season releases. Results where spring releases were employed

may be misleading since the primary contribution of such birds should be that of supplying young of the year. Wild birds comprised a relatively minor portion of the bag when hunting-season stocking was used.

The wide range of returns, and the variation in the importance of wild birds in the harvest, even in these small samples, illustrates the fact that no single rule applies to all Wisconsin preserves. The wide diversity of habitat and the variation in location of preserves in relation to good natural pheasant habitat obviously play a major role in the recovery of releases and in the production of wild pheasants on preserves. Some areas inspected had no suitable winter cover. Stocking under the gun, followed by hard hunting, was required to produce any harvest. Other areas contained an abundance of year-around cover and possibly could sustain the existing hunting pressure indefinitely without any stocking.

Hunting

License-renewal forms in Conservation Department files offered no means of determining hunting pressure on preserves. The majority of licensees contacted had not maintained records of hunting, other than

TABLE 7
Band Returns From Shooting Preserves Practicing Leg-banding
of Released Pheasants

| Pre-serve | Time of Release | No. Years | No. Banded | Recovered | | Wild Birds in Bag | |
|----------------|------------------------|-----------|------------|-----------|----------|-------------------|-------------------|
| | | | | No. | Per Cent | No. | Per Cent of Total |
| a | Spring | 1 | 81 | 0 | 0 | 75 | 100 |
| b | Spring | 2 | 295 | ? | 8-10 | ? | ? |
| c | Spring | 4-5 | 450 | 45 | 10 | ? | ? |
| d | Spring | 11 | 242 | 9 | 4 | ? | ? |
| e | Summer | 1 | 40 | 10 | 25 | 30 | 75 |
| f | Summer | 2 | 229 | 25 | 11 | 112 | 79 |
| g | Summer | 1 | 375 | 33 | 9 | 30 | 48 |
| h | Fall | 1 | 254 | 2 | 2 | 87 | 98 |
| j ¹ | Summer-Fall | 1 | 1,249 | 120 | 10 | 410 | 74 |
| j | In season ² | 1 | 329 | 196 | 60 | 18 | 9 |
| k | In season | 2 | 800 | ? | ? | ? | 3 |
| l | In season | 1 | 132 | 49 | 37 | 18 | 27 |
| m | In season | 4 | 650 | ? | 50-75 | ? | (small) |
| n ¹ | In season | 1 | 1,027 | 416 | 41 | 339 | 46 |
| o ³ | In season | 3 | 5,073 | 2,466 | 49 | 162 | 6 |

¹Returns from several preserves, Buss (1946).

²Hunting season.

³Bark River Game Preserve, Inc.



Sporty, natural-type hunting provided on shooting preserves helps relieve the mounting pressure on public hunting lands.

a record of the total harvest. However, 37 operators provided estimates of the number of different hunters using their preserves annually (Table 8). The number of hunters per 100 acres on these preserves was considerably lower than that on 4 state-operated public hunting grounds (Table 9) but preserve figures included only different individuals. The 37 preserves reporting were used by a total of 237 owners or club members annually. Licensees estimated an additional 421-528 guests each year, for a grand total of 658-764 different hunters. The average number of hunters per preserve reporting was 19. Total hunters on individual areas ranged from 3 to 300.

Twenty-eight operators were able to estimate hunting pressure roughly

TABLE 8
Hunting Pressure and Hunters on a Sample of Shooting Preserves

| | | | | | |
|--|------|-------|-------|-------|---------|
| Number different hunters per 100 acres | 0-4 | 4-8 | 8-12 | 12-16 | Total |
| Number shooting preserves | 28 | 7 | 1 | 1 | 37 |
| Number gun-hours per 100 acres | 0-20 | 21-40 | 41-60 | 61-80 | 80 plus |
| Number shooting preserves | 8 | 11 | 3 | 2 | 4 |
| | | | | | Total |
| | | | | | 28 |

in gun-hours per season (Table 8). It appeared that shooting preserves received approximately the same amount of hunting pressure (as measured in total gun hours), on the average, as the four public hunting-grounds cited. While preserve pressures were distributed over a 90-day season, and public hunting-ground pressures were condensed within the 14-25 days of the state seasons, the comparison still indicates the ability of shooting preserves to absorb considerable hunting pressure.

At a maximum, the number of hunters using all shooting preserves in the state annually during the study period was less than one per cent of the small-game license holders in Wisconsin. The presumably much larger number of hunters on commercial game-farm establishments was not included in this estimate. Total use of controlled-shooting areas as of 1957 in Wisconsin may have been comparable to that reported in California, where 1.8 per cent of the state's pheasant hunters utilize private or commercial preserves (Hart, 1957).

Interviewees reported little over-all change in total hunting pressures since first licensing their areas. Six preserves received less, and 8 received more pressure at the time of the interview than in the past, while hunting remained relatively constant on 28 preserves.

TABLE 9
Hunter Use of Four Wisconsin Public Hunting Grounds¹

| Area | Acres | Gun-Hours | | Number Hunters | |
|----------------------|-------|-----------|---------------|----------------|---------------|
| | | Number | Per 100 A. | Number | Per 100 A. |
| Potter's Marsh | 4,020 | 3,295 | 82 | 1,478 | 37 |
| Yellowstone | 1,875 | 977 | 51 | 446 | 23 |
| Brodhead | 3,300 | 5,322 | 161 | 2,007 | 61 |
| Mazomanie | 9,918 | 1,967 | 20 | | |

¹From Kabat *et al.*, 1955.

As at the Bark River preserve, some preserves had evolved their own ground rules in addition to the state regulations covering hunting. Two club and co-operative groups used self-imposed bag limits for members. One preserve under a single owner, with 5-6 hunting guests annually, prohibited hen shooting. Some or all of the hunters on 5 other areas limited the hen kill voluntarily. All preserve hunters used retrieving dogs on most of their hunts, with 13 of the 42 operators requiring or always using dogs on their preserves. It is well-established that crippling losses are considerably reduced when hunters use dogs (Randall, 1939; Hart *et al.*, 1951). Research at the Bark River preserve, where retrievers are required on every hunt, indicated a crippling loss of less than 10 per cent, compared to typical losses of 16-39 per cent in non-preserve hunting (Stokes, 1954). Since a high percentage of preserve hunters normally use dogs, crippling losses on shooting preserves probably run well below the average on other lands.

An apparent high standard of sportsmanship prevailed almost universally among preserve licensees. Proof of conduct was offered by the fact that only 2 of the 150 licenses granted by the state have been revoked because of game violations.

An estimate of the occurrence and utilization of game species other than pheasants showed that the cottontail rabbit was the primary species present and hunted on most preserves, although waterfowl were hunted wherever they occurred (Table 10). A lack of interest in squirrel and deer hunting was evident.

TABLE 10
Status and Hunting of Various Game Species on 42 Preserves

| Species | Status | | Hunting | | |
|----------------------|-----------------|--------|-------------------------|-------------------------|---------------|
| | Present | Common | Intensive (Specific) | Light (In- cidental) | Not Hunted |
| Rabbit----- | 39 | 27 | 10 | 24 | 5 |
| Squirrels----- | 27 | 11 | 1 | 7 | 19 |
| Deer----- | 21 ¹ | 5 | 2 | 2 | 17 |
| Ducks----- | 26 ² | 10 | 14 | 12 | 0 |
| Ruffed grouse----- | 1 | 0 | 0 | 1 | 0 |
| Woodcock----- | 15 | 2 | 1 | 2 | 12 |
| Bobwhite quail----- | 4 | 0 | 0 | 1 | 3 |
| Prairie chicken----- | 1 | 0 | 0 | 0 | 1 |

¹Usually in small numbers; frequently transient.

²Mostly migrants in small numbers.

Habitat and Management

Habitat

An estimated 44 per cent of the total acreage in the 42 preserves inspected was under cultivation, with the remaining lands about evenly divided, in the aggregate, between marshland, woods and pasture (Table 11). Ungrazed, nonwooded uplands, which in most cases provide excellent nesting cover, and tamarack marshes, perhaps one of the best winter-cover types, comprised the smallest total acreages and were present on the fewest preserves.

TABLE 11
Cover Types on a Sample of 42 Shooting Preserves, 1956-57

| Cover Type | Per Cent of Total Land Area Occupied | | | | | Total Acres | |
|--------------------------------------|--------------------------------------|------|-------|-------|--------|-------------|-------------|
| | 0 | 1-25 | 26-50 | 51-75 | 76-100 | Num- ber | Per Cent |
| Cultivated----- | 11 | 8 | 12 | 8 | 3 | 8,666 | 44 |
| Woods, upland----- | 17 | 18 | 5 | 1 | 1 | 1,836 | 9 |
| Woods, lowland----- | 27 | 12 | 1 | 1 | 1 | 1,753 | 9 |
| Marsh, brush----- | 12 | 22 | 8 | 0 | 0 | 1,874 | 10 |
| Marsh, grass----- | 11 | 22 | 7 | 2 | 0 | 2,421 | 12 |
| Marsh, tamarack----- | 35 | 7 | 0 | 0 | 0 | 354 | 2 |
| Marsh, cattail----- | 28 | 13 | 1 | 0 | 0 | 691 | 4 |
| Grass pasture----- | 23 | 15 | 4 | 0 | 0 | 1,177 | 6 |
| Ungrazed, non- wooded upland----- | 33 | 8 | 1 | 0 | 0 | 555 | 3 |
| Water ¹ ----- | 35 | 7 | 0 | 0 | 0 | 149 | 1 |

¹Includes only lakes or ponds occupying over one per cent of total area.

The inclusion of pheasant wintering marshes in preserves has been used as an argument against expansion of the preserve program, as witnessed by the specific provision of the 1948 revision of the shooting preserve code (Table 1). Only 16 of the 42 preserves inspected contained wintering cover over 100 acres in total extent. Thirteen of these 16 preserves, including the 4 largest, were located in the center of much more extensive areas of similar cover, not under preserve license. In several cases, the surrounding unlicensed cover was diminishing rapidly due to drainage and cultivation, however. Over one half of the preserves inspected had less than 100 acres of winter cover; 8 (19%) had none at all.

Land Use

Farming was the primary use of the land on 25 (59%) of the 42 areas (Table 12). Hunting for pheasants or other game species constituted the primary use of the remaining 17 preserves.



Food-patch plantings on a number of Wisconsin shooting preserves provide standing food for pheasants throughout the winter.

Management

Management practices used on shooting preserves included such tangibles as the maintenance of winter feeders and the establishment of food and cover plantings. Twenty preserve licensees (48%) planted food patches for winter use by pheasants. Food patches ranged from 1 to 140 acres and included from 1 to 18 per cent of the total preserve acreages. Most were under 10 acres in size. Field corn was the most popular food-patch crop but sweet corn, buckwheat, sunflowers, sorghums and alfalfa also were planted on 12 preserves.

Twenty preserves employed winter feeders. Most were maintained every year, but a few were operated only during "hard winters". Eight of the preserves maintaining feeders also supplied food patches. In all, 32 (77%) of the preserves inspected made some provision for winter food for pheasants.

Perennial cover had been planted on 13 of the 42 areas. Ten of these plantings were limited to a fraction of one per cent of the total acreage. Only one preserve was developed extensively by this means.

Operators used conifers most often, but 7 had experimented with shrubs or multiflora rose, and 2 had attempted grass seedlings for nesting cover.

The preservation of natural wildlife habitat was a less obvious but perhaps more important management practice. Twenty-five of the preserves included bottomland woodlots suitable for grazing use. Operators restricted or prohibited grazing on 15 of these areas. In 8 cases grazing would have been curtailed even if the area had not been licensed as a preserve. But licensing was directly responsible for restrictions on grazing on 7 (28%) of these 25 preserves.

Drainage of marshlands is a serious problem endangering wildlife habitat in Wisconsin (McCabe, *et al.*, in Allen, 1956). For this reason the degree to which preserve operations had prevented proposed drainage projects was estimated. Marshland on 10 (23%) of the preserves inspected had been drained entirely or in part since the areas had been

Other game species, in addition to pheasants, benefit from shooting preserve food-patch plantings. This patch of standing corn on a preserve in southeastern Wisconsin received heavy use from deer and squirrels, as well as ringnecks.



licensed. Preserve use had not curtailed drainage on 5 of these areas. In 2 cases, however, drainage had been limited and apparently resulted in a net gain for wildlife, since the areas placed under cultivation after drainage diversified the habitat without major destruction of cover. On 4 preserves drainage had been held to a minimum for motives stemming

TABLE 12
Land Use of a Sample of 42 Shooting Preserves

| Primary Land Use | No. | Secondary Land Use on Same Preserves | | | | | |
|--------------------|-----|--------------------------------------|------------------|----------|-----------|----------------|----------------------|
| | | Shoot-ing Pre-serve | General Farm-ing | Graz-ing | Dairy-ing | Truck Farm-ing | Hunt-ing Recre-ation |
| Shooting preserve | 6 | -- | 0 | 3 | 0 | 5 | 0 |
| General farming | 16 | 16 | 0 | 0 | 0 | 2 | 0 |
| Grazing-dairying | 6 | 6 | 0 | 0 | 3 | 5 | 0 |
| Truck farming | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| Hunting-recreation | 8 | 8 | 0 | 1 | 0 | 0 | 0 |
| Game farm | 3 | 3 | 0 | 1 | 0 | 0 | - |
| Totals | 42 | 35 | 0 | 5 | 3 | 12 | 0 |

directly from use of the areas as shooting preserves. An additional 4 licensees whose lands included drainable marsh stated that their use of the land for preserve shooting had resulted in cancelling all plans for drainage.

In addition to the habitat preservation cited, about 75 per cent of the preserves visited practiced marsh-fire prevention, maintained fence-row and odd-corner cover and eliminated grazing on grassy uplands. Some of these practices might have resulted if the areas concerned had not been licensed as shooting preserves, but it appeared that wildlife cover in most cases definitely profited from licensing. This concern for habitat preservation was of special interest since the Wisconsin statutes provide no direct incentive or recognition for cover development or maintenance.

Seventeen of the 42 preserve operators interviewed practiced predator control to some extent, primarily of foxes. Only 4 operators employed rigid controls. Hawks and owls rarely were controlled, and only one licensee mentioned avian predators as being an important problem. Fourteen operators considered predation to be a source of moderate pheasant losses, and 5 individuals blamed predators for making major



A number of valuable wetland areas in southeastern Wisconsin have been protected from drainage as a result of being licensed as shooting preserves in the 1930's.

inroads in their birds. Foxes, feral cats and dogs were implicated, in that order.

Management practices of benefit to wildlife appeared to be carried out most extensively on owned areas, and secondly on leased areas under club or co-operative control. Preserves leased by single individuals had undergone no habitat improvement beyond occasional food-patch plantings.

When questioned as to what they believed accounted for most of the pheasants stocked but not recovered, licensees named straying, poaching and predation, in that order. Eleven licensees stated that they had no idea what happened to missing birds.

Nineteen licensees reported moderate to extensive trouble with trespassing hunters. Solutions to this problem ranged from mild verbal warnings to the deputization of club members or employees who patrolled the preserve. Several operators had experienced property damage or marsh burning as an apparent result of reprimanding trespassers.

EVALUATION

Objectives and Contributions of Preserve Shooting

At the time when shooting preserves were first established in Wisconsin, it was hoped that the preserve system would enable landowners to receive a financial return (through a commercial operation) for "protecting and producing game" (Wis. Cons. Dept., 1932). Actually, only 2 of the 72 shooting preserves licensed in 1957 operated for purposes of financial profit. Only 12 of the 150 preserves licensed from 1932 through 1957 ever operated commercially. Thus the preserve law has not produced monetary gains for most licensees in return for game production and protection. Interviews with preserve and game-farm licensees, and comparisons with the situation in other states, indicate that commercial hunting operations are not feasible under the relatively short Wisconsin shooting preserve season now permitted. Typical fee-shooting in Wisconsin has developed instead under the more liberal Wisconsin game-bird and fur-farm law.

Leopold (1933) stated that shooting-preserve legislation should encourage private parties to produce game through the provision of special seasons and bag limits, which would make such production worthwhile. No mention of financial returns was made. The fact that the vast majority of Wisconsin preserves have been and are now private, noncommercial operations indicates that this function has been fulfilled.

Shooting preserves in the United States as a whole have provided a considerable number of hunters with good shooting at a time when sportsmen are encountering increasing difficulty in locating hunting grounds (Titus and Laycock, 1955). This is true in Wisconsin as well. The number of individuals utilizing private preserves in the state as yet is only a fraction of the number of licensed hunters. However, any agency reducing hunting pressure on public lands can be considered to contribute to the state hunting program.

Stocking

The extent to which pheasants stocked on shooting preserves contribute to shooting and breeding populations on the preserve itself and the surrounding area, is the one point consistently restated in the shooting-preserve question. The contribution of preserve liberations is involved, directly or indirectly, in 3 of the 4 original objectives for Wisconsin preserves (Wis. Cons. Dept., 1932), and in 2 of the 3

important criticisms lodged against the preserve concept in the state.

It is important to distinguish between *initial* stocking, in areas of suitable habitat but no prior pheasant populations, and stocking where pheasants are already well-established. Interviews with "old-time" preserve operators and wardens suggest that preserve stocking in the early 'thirties probably contributed importantly to the development of pheasant populations in several localities in southeastern Wisconsin. At that time few pheasants had been introduced in these areas, which eventually proved to be good pheasant range.

At present, however, after 20 years of liberations by the state, sportsmen's clubs and shooting preserves, suitable pheasant range in Wisconsin presumably is occupied by established pheasant populations. Straying, preserve-stocked birds no longer can establish new wild populations, but could contribute to the maintenance of existing populations and also provide surplus cocks during the state-wide hunting season.

The intensive and extensive phases of this study provide evidence, although not always complete, in the light of which maintenance and surplus-cock stocking can be examined. Preserve liberations of pheasants may be divided into two categories, by timing: (1) spring stocking, and (2) stocking just prior to and during the hunting season. (Summer liberations now are curtailed by law, and their use was declining prior to legal restrictions in any event).

Spring stocking, and the shooting credits derived from its use, is based on the theory that hens released in spring will rear young, and so contribute to the fall population. Regulations existing at the time of this study allowed 3 shooting credits for each hen released in spring, in addition to one credit for the hen. For preserves to merit these credits, each released hen would have to rear 3 young successfully into fall. The limited banding program at some preserves indicated that spring-released hens sometimes survive until the following winter (Table 7) and presumably may rear young, but there is no direct evidence of such reproduction.

Kabat *et al.* (1955), in a study of hens released in spring on public hunting grounds, suggested that each of these hens contributed less than one young bird, on the average, to the fall population.

The motives stated by preserve licensees interviewed, relative to the use or abandonment of spring releases, strongly suggest that spring stocking has little effect on most preserve pheasant populations in fall. All interviewees who used spring releases exclusively, and were satisfied

with the results, (a) did little shooting or (b) operated preserves where wild pheasant populations apparently provided sufficient shooting without the release of spring breeders.

There was little doubt that spring stocking on at least the majority of Wisconsin preserves did not result in sufficient production of juveniles in the fall to warrant 3 shooting credits. Where licensees depended on spring liberations for fall shooting, they may often have been harvesting pheasants produced largely by the wild-bird populations of their preserves, supplemented to a minor extent by released hens. This was certainly the case at the Riley preserve (Leopold, 1940; Schorger, 1955). Of the 18 preserves utilizing spring releases solely or primarily in the past, 24 per cent had shot more birds than they had released. Such harvests, although legal, conceivably could endanger the resident wild-bird populations on these preserves if hens predominated in the bag.

All interviewees felt that hunting-season releases produce the most satisfactory shooting returns. Research at the Bark River preserve demonstrated that hunting-season liberations can provide excellent shooting with no harm to resident populations, in areas containing winter cover. Most preserves where hunting-season releases have been banded have shown a small wild-bird harvest (Table 7). The one case on record where wild pheasants made up a large percentage of the bag, in spite of hunting-season stocking, was presented by Buss (1946). Apparently, several preserves were included in these returns, but the author failed to specify the areas involved or give a breakdown of returns by individual preserves. Due to the extreme diversity of conditions on Wisconsin preserves, lumping of returns from several areas renders the results relatively useless for interpretation. The wild-bird harvest of one preserve operating on a large scale, in an area with a good pheasant population, could outweigh returns from a number of smaller preserves.

The lack of winter cover on 20 per cent of the inspected preserves means that pheasants would not hold for shooting unless stocked under the gun. On these areas, permission to shoot 100 per cent of the birds released would be ecologically sound, although probably impossible to achieve.

The Bark River preserve study, as well as that conducted by Buss (1946), shows that some pheasants released on preserves are bagged on surrounding lands. At Bark River the number bagged outside the preserve boundary amounted to about 20 per cent of the total harvest by nonpreserve hunters within 1.5 miles of the preserve.

Because of poaching problems, nearly half of the licensees interviewed did not use their areas for stocking or hunting until after the close of the regular state pheasant season. Failure to liberate pheasants during the state-wide season, and a reduction of hunting pressure that might force birds out, automatically reduces the opportunities for surrounding hunters to bag preserve releases. This is an unusual example of the reduction in hunting opportunities for all sportsmen as a result of the heedless actions of trespassing hunters.

These investigations suggest that pheasants released at the Bark River preserve may have made up as much as 25 per cent of the spring population within 2 miles of the boundary. This preserve, at least, contributes to the maintenance of surrounding pheasant populations. The extent to which other preserves provide maintenance stocking remains unknown.

The Wisconsin Conservation Department has stocked an average of 202,261 pheasants annually from 1940 to 1954 (Kabat *et al.*, 1955). The entire number of birds released on shooting preserves from 1934 through 1956 amounted to less than three-quarters of one of these annual releases by the state. The total harvest on shooting preserves during the same period accounts for 52 per cent of the pheasants released. Consequently it seems apparent that, while pheasants liberated on preserves may have helped in the initial establishment of pheasant populations in the state, they cannot make more than a minor contribution to "outside" hunting or the maintenance of wild populations at present.

Adverse Criticism and Objections

A major criticism of the shooting preserve law results from the fear that a few individuals might be able to license the bulk of the best winter habitat in the state for private use (Schorger, 1955). Actually, none of the preserves inspected appeared to endanger public hunting as a result of including wintering habitat, even though licensed prior to the wintering-ground provision in the regulations.

Another objection to the preserve concept is the extended shooting season permitted, which some sportsmen believe allows preserves to shoot wild pheasants drawn into winter cover from surrounding areas (Schorger, 1955). The fact that so few Wisconsin preserves have sizable wintering grounds, and that these areas appear to offer little better cover than the surrounding region, suggests that most preserves probably harvest few wild birds not produced on the premises. This limited wild-bird harvest is more than compensated for by preserve

stocking, since approximately 50 per cent of the released birds are never bagged. I found no evidence at the Bark River preserve, which contains as much or more good wintering cover as any preserve in the state, that wild pheasants from the surrounding vicinity are shot on the preserve in winter. The annual wild-bird kill at Bark River from 1955 through 1957 amounted to less than 25 per cent of the fall population of wild birds reared on the preserve itself.

The remaining important criticism of the preserve system in Wisconsin in 1957 was that shooting credits granted for spring-released hens were too liberal. This criticism probably was valid, as pointed out above.

Favorable Aspects

Wisconsin shooting preserves are helping to meet some of the most pressing problems facing game management in the state. They have absorbed some of the mounting hunting pressure, and have interested landowners in stocking game. They contribute at least some pheasants to hunters and to breeding populations of pheasants on surrounding lands. The co-operative type of preserve has fostered sound farmer-hunter relations. Leopold (1940) described a classic example of this type of preserve, which he was instrumental in founding. Club-type preserves that are composed of city hunters leasing lands from farmers are very similar to co-operatives. The seven co-operatives and club operations visited during this study appear to maintain a high standard of farmer-hunter relations.

Most importantly, the preserve program has resulted in the preservation and improvement of wildlife food and cover during a period that has witnessed the steady destruction of habitat on all sides. Natural cover has been encouraged on 75 per cent of the preserves inspected, and preserve operations have produced extensive development of food and cover, or the curtailment of drainage, in a number of cases.

By building habitat on barren land, and maintaining and improving original, natural habitat, preserves serve as reservoirs of pheasants and other wildlife species in the midst of an increasingly drained and clean-farmed landscape. This tendency already is demonstrated strikingly in some southeastern Wisconsin counties.

CURRENT REVISIONS OF SHOOTING PRESERVE REGULATIONS

The 25 years that shooting preserves have operated in Wisconsin certainly represent an adequate time span on which the merits of the



This well-planned layout of perennial cover and annual food plantings on a Wisconsin shooting preserve illustrates the type of habitat improvement made feasible under a preserve license, on land once heavily farmed and grazed, and unproductive of wildlife.

preserve concept may be judged. Evidence obtained in this study, and elsewhere, leads to the conclusion that shooting preserves have operated to the net gain of wildlife and wildlife habitat in Wisconsin, and to the benefit of the public as a whole, during this period. These benefits have accrued at no cost to the public. Some of the positive contributions of preserve shooting—such as absorbing a share of the hunting pressure on private lands, and the preservation of wetland habitat—have only recently become obvious, as these particular problems become acute in the state. These contributions should have increasing significance in the future.

With these points in mind, the Wisconsin Conservation Commission in 1959 revised licensed shooting preserve regulations as follows:

1. *Eliminated the restriction against granting licenses for areas including pheasant wintering grounds.* This restriction which had proven extremely difficult to interpret and administer objectively, in effect prevented shooting preserves from fulfilling one of their most important functions—the preservation of wetland habitat.

2. *Eliminated extra credits for hens stocked in spring.* Without positive evidence that extra credits were warranted, this rule could not be justified. This change should result in considerable increases in the number of birds released during the hunting season, and reduce the possibility of endangering wild pheasant populations. Credits for birds stocked at less than 12 weeks of age also were eliminated.

3. *Increased the length of the hunting season on preserves through January 31.* The extended hunting season is the primary inducement for licensing a shooting preserve. Most states allow a 5- to 6-month preserve hunting season, making Wisconsin's season the shortest in the U. S. In recent years the state-wide "wild" pheasant seasons in Wisconsin have run for as long as 45 days. With a relatively short preserve season there is a lessened incentive for maintaining costly stocking and cover development programs, which benefit the sporting public as a whole. Evidence from this study gives no reason to believe that an extension of the preserve season would endanger wild-bird populations, especially with the elimination of extra credits for spring-released hens.

4. *Provided a minimum-stocking rule of one bird for each 4 licensed acres, up to 640 acres.* Most states require a preserve licensee to release a given number of birds annually to retain his license. The purpose of this rule is to correct possible abuses of preserve licenses—for example, licensing an area for the sole purpose of reducing trespass by the posting of preserve signs—which have occurred at times in the past. In addition, a minimum-stocking rule should serve to increase the total number of pheasants released in each year on shooting preserves.

5. *Increased the incentive for habitat preservation and improvement.* Carrying out a long-range food and cover management plan, subject to the approval of the Conservation Department, now qualifies a preserve licensee for an extension of his hunting season through February, for shooting cock pheasants.

These changes in regulations individually and collectively are designed to serve three purposes. First, to render Wisconsin's preserve rules more workable, and more in line with regulations that have

proven effective in other states. Second, to provide further safeguards against possible misuse of preserve licenses. Third, to provide incentives that will encourage new and existing preserves to increase those activities of proven benefit to the public.

SUMMARY

Wisconsin first licensed shooting preserves in 1931. Original regulations had been revised seven times by 1957, primarily to restrict the size, number and location of preserves. Present regulations allow a 75 per cent harvest of released birds and a shooting season of approximately 105 days. In 1957 only 2 of 72 existing licensed preserves operated commercially—typical fee-hunting having developed under other laws. Between 1935 and the time of this study (1955–58), license cancellations about equaled new applications, resulting in a relatively constant number of preserves licensed each year (60–72). More hunting and a place to hunt, relief from trespass, and a desire to save game were motives for licensing. Operational problems, changes in land tenure, and personal health of the licensees caused most license cancellations. Opposition to preserves by a portion of the public was strong in the past, but has subsided.

In 25 years, from 1932 through 1957, shooting preserve operators liberated 171,362 pheasants. Spring and hunting-season stocking were most popular in the past, and were used almost exclusively in 1956–57. Spring stocking was used mainly for the extra credits involved; hunting-season stocking insured good hunting. From 1932 through 1956 the total harvest amounted to 52 per cent of the reported releases.

In 1956, 37 preserves were used by a total of between 658 and 764 hunters, for an average of 19 hunters per preserve annually. Only 16 of 42 preserves inspected contained more than 100 acres of winter cover, with most of these 16 located in regions where similar, unlicensed cover was plentiful, although rapidly decreasing. Farming was the main land use on most preserves.

Most preserves inspected provided food for pheasants in winter. Cover plantings, curtailment of grazing, and restrictions on drainage had benefited wildlife cover on a number of preserves as a direct consequence of licensing.

The Wisconsin shooting-preserve system has not resulted in financial gain for preserve licensees. Overflow of pheasants stocked on preserves probably makes only a limited contribution to outside hunting at present. Spring stocking credits probably were too liberal. Shooting preserves in

Wisconsin provide shooting for a portion of the state's hunters, and have fostered good relations between farmers and hunters. A major contribution of preserves has been the preservation and improvement of wildlife habitat, especially marshlands.

In order to allow greater opportunity for shooting preserves to carry out activities of proven benefit to the public, and provide more workable rules, a major revision of regulations was made in 1959, as follows: Removal of the restriction against licensing areas including pheasant wintering grounds; elimination of extra credits for hens stocked in spring; lengthening of the preserve hunting season; provision of a minimum-stocking requirement; and increased incentive for habitat management.

LITERATURE CITED

- ALLEN, D. L.
1956. Pheasants in North America. Harrisburg, Pa.: Stackpole Co., and Wash., D.C.: Wildl. Mgmt. Inst. xviii, 490pp.
- BURGER, G. V.
1958. Pheasant hunting and management on Wisconsin licensed shooting preserves. Unpubl. Ph.D. thesis, Univ. of Wis.
- BUSS, I. O.
1946. Wisconsin pheasant populations. Wis. Conserv. Dept. Publ. 326. A-46. 184pp.
- DICKEY, C.
1957. Shooting preserve management. New York, N.Y.: Sportsmen's Service Bureau. 32pp.
- HART, C. M.
1957. Controlled pheasant hunting areas in California. Proc. 37th Ann Conf. Western Assoc. State Fish and Game Commissioners. pp 256-264.
- HART, C. M., AND L. JONES AND D. E. SHAFFER
1951. Pheasant cooperative hunting area results, 1950. Calif. Fish and Game, 37(4): 395-437.
- KABAT, C., F. M. KOZLIK, D. R. THOMPSON AND F. H. WAGNER
1955. Evaluation of stocking breeder hen and immature cock pheasants on Wisconsin public hunting grounds. Wis. Conserv. Dept. Tech. Bull. (Wildl.) No. 11. 58pp.
- LEOPOLD, A.
1933. Game management. New York: Charles Scribner's Sons. xxi, 481pp.
1940. History of the Riley game co-operative. J. Wildl. Mgmt., 4(3): 291-302.
- OLIN MATHIESON CHEMICAL CORP.
1955. Controlled shooting as demonstrated at Nilo Farms. East Alton, Ill., 40pp.
- PALMER, T. S.
1910. Private game preserves and their future in the United States. U. S. Dept. Agric., Bur. Biol. Surv. Circ. No. 72. 11pp.
- RANDALL, P. E.
1939. Ringneck pheasant crippling losses. Pa. Game News, 10(5): 3,31.

- SCHORGER, A. W.
1955. Public and private shooting preserves for game birds and small game mammals. Paper presented at 1955 meeting, Internat. Assoc. Game, Fish and Conserv. Commissioners, Augusta, Ga. 15pp. (mimeo.)
- STOKES, A. W.
1954. Population studies of the ring-necked pheasant on Pelee Island, Ontario. Ont. Dept. Lands and Forests, Tech. Bull. Wildl. Ser. No. 4. 154pp.
- SULLIVAN, J.
1958. Fee shooting's twentieth anniversary. Pa. Game News, 19(1).
- TITUS, H. AND G. LAYCOCK
1955. Is public hunting doomed? Field and Stream, 60(7):82-84, 172-176.
- TUBBS, F. F.
1946. Pen-reared birds don't help sport. Mich. Conservationist, 15(3): 10-11.
- WILLIAMSON, L. A.
1940. Regulated private shooting preserves in Connecticut. Trans. N. Amer. Wildl. Conf., 5:354-359.
- WISCONSIN CONSERVATION DEPT.
1932. The Wisconsin licensed shooting preserve law. Madison, Wis., 20pp.

APPENDIX A
**Number and Acreage of Wisconsin Shooting
 Preserves, 1961-62**

| County | No. Preserves | Total Acreage |
|------------------|------------------|------------------|
| Columbia..... | 3 | 1,536.46 |
| Dane..... | 13 | 3,270.77 |
| Dodge..... | 14 | 3,711.74 |
| Fond du Lac..... | 3 | 907.65 |
| Green..... | 2 | 660 |
| Green Lake..... | 2 | 909 |
| Jefferson..... | 16 | 6,409.53 |
| Kenosha..... | 3 | 475 |
| Kewaunee..... | 1 | 151.8 |
| Marquette..... | 1 | 316.1 |
| Outagamie..... | 3 | 2,570 |
| Ozaukee..... | 1 | 160 |
| Portage..... | 1 | 140 |
| Racine..... | 11 | 7,516 |
| Rock..... | 7 | 1,819.386 |
| Sheboygan..... | 3 | 511 |
| Walworth..... | 12 | 5,352.27 |
| Washington..... | 1 | 223 |
| Waukesha..... | 7 | 3,429.61 |
| Waupaca..... | 3 | 769.30 |
| Waushara..... | 3 | 543.64 |
| Winnebago..... | 2 | 596.41 |
| Wood..... | 1 | 120 |
| Total..... | 111 | 42,098.666 |

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