

rector of the Oklahoma Department of Wildlife Conservation and the Ouachita National Forest. As the title of this paper states, Cooperation is the Key to Game Management. This we believe. For example, we hold annual 2-day meetings. These are informal meetings with a field trip to actually see wildlife work on the ground. Field trips may be considered looking over some new territory such as we did this year on a trip to the Wichita Wildlife Refuge or two years ago we went on a trip to the Panhandle Grasslands. These meetings are either started with or followed with an indoor session on plans and programs for the coming year and the review of the progress made to date.

These meetings are extremely beneficial and with the fine cooperative effort that has been shown in the past and will continue in the future, the National Forest in Oklahoma will provide an area where wildlife will abound.

A BRIEF STUDY OF HUNTERS AND THE OWNERS OF THE LAND ON WHICH THEY HUNT

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For 20 years or more, there has been concern about increasing hunting pressure and decreasing hunting land. The U. S. Department of Agriculture has attempted to lessen this problem and decrease surpluses of farm products at the same time by subsidizing conversion of agricultural land to recreation land.

Recreation is booming. Boaters, fishermen and water skiers are crowding lakes faster than the Corps of Engineers can build them. New bowling alleys were built in nearly every town of any size, and cowpastures are being turned into golf courses every month.

Hunters, though, are decreasing. After the first few days of the season, it is hard to find enough hunters for our biological samples in Kentucky. Even the public hunting areas are often deserted. We have fewer hunters than we had nine years ago. Our income from game is only about five percent higher than it was in 1957.

Since the wildlife profession exists primarily to serve hunters, this is a disturbing situation. The status of hunting is becoming more and more like that of the whooping crane. It's being crowded onto special reservations.

OBJECTIVES AND METHODS

The basic objective of this paper is to contribute to the preservation and expansion of the sport of hunting. The wildlife profession needs more hunters if it is to survive as a profession. As a nation, we need the physical exercise of hunting to help balance the emphasis on playground and picnic table recreation.

For high school boys, recreation too often means a fast jalopy and a cooler full of beer. If hunting could replace some of this type of activity, it might decrease the rate of physical unfitness encountered by the armed services.

Too many boys are growing up without the moral guidance their parents should provide. Hunting is one of the activities a father and son can enjoy together. It should provide more opportunity for character building than is provided by Little League baseball and other city recreation projects.

Hunters are paying people like you and me to provide worthwhile hunting opportunities for them. It's high time we made some effort to find out what opportunities the majority of license buyers consider worthwhile.

To determine where people find hunting privileges, a one percent sample of Kentucky hunting licenses was taken systematically with a

random start. Questionnaires were mailed with two follow-ups in Eastern Kentucky and three in Western Kentucky. The 2,335 names yielded 1,068 returns, comprising 0.4% of the licenses sold.

Replies were divided into the following 10 subsamples:
 Rural West: 24 counties. 39,966 hunters. 154 replies.
 Urban West: five small cities. 24,700 hunters. 88 replies.
 Rural Central: 20 counties. 32,004 hunters. 89 replies.
 Louisville: 33,221 hunters. 145 replies.
 Rural Bluegrass: 31 counties. 35,954 hunters. 162 replies.
 Urban North: three counties. 11,722 hunters. 116 replies.
 Lexington: 8,441 hunters. 47 replies.
 Rural Mountains: 33 counties. 58,140 hunters. 204 replies.
 Ashland-Greenup: two counties. 7,160 hunters. 36 replies.
 Non-residents: Approximately 6,250 hunters. 27 replies.

DISTRIBUTION OF HUNTING

Data from the questionnaires are shown in Tables I, II, III and IV. The low percentage of returns was disappointing. Some of the percentages were so preponderant, though, that they cannot be discounted.

Based on their acquaintance with landowners involved, and type of hunt, responders divided their trips into seven categories.

TABLE I—DISTRIBUTION OF HUNTING ON VARIOUS TYPES OF LAND OWNERSHIP.

Land Owned By:	% Hunters	% Trips
Relatives or friends	79	37
Strangers (Open to all hunters)	60	25
Acquaintance made through hunting	47	14
The hunter	33	16
Governmental Agency	25	8
Individual (fee charged)	2.4	0.33
	—	100.33
Trips for dog training	26	8
Field Trials	0	0

Friends and Relatives: Almost four-fifths of all hunters used land owned by relatives or close friends, and this accounted for one-third of all hunting. Only 56% of the non-residents found access to such land. In the Ashland-Greenup area, 83% hunted on this land, accounting for 42% of the trips.

Open Private Land: Private land where all hunters were welcome provided 25% of the trips and was used by 60% of the hunters.

In Western Kentucky, 70% of the hunters used open private land. This figure dropped to 38% to 43% in the three largest cities (Louisville, Lexington and Urban Northern Kentucky). For these hunters, it provided only 12% to 19% of the hunting.

TABLE II—HUNTERS REPORTING USE OF MAJOR PUBLIC LANDS.

Region	Daniel Boone Forest	Ft. Knox	Lake Cumberland	Camp Breckinridge	Ballard Waterfowl	LBL*	Ft. Campbell
Rural West	—	260	—	1,820	1,560	2,080	1,800
Urban West	—	—	—	2,529	1,405	562	281
Rural Central	—	4,680	1,440	—	—	—	360
Non-resident	—	1,852	—	—	—	232	—
Louisville	916	4,809	—	—	—	229	—
Rural Bluegrass	1,326	884	884	221	—	—	—
Urban North	303	404	—	101	—	—	—
Lexington	720	180	180	—	180	—	—
Rural Mountain	9,405	—	2,280	—	—	—	—
Ashland-Greenup	600	—	—	—	—	—	—
Total	13,265	13,069	4,784	4,671	3,145	3,103	1,811

* Land Between the Lakes

TABLE III—HUNTING TRIPS REPORTED ON MAJOR PUBLIC LANDS.

Region	Sample	Daniel Boone Forest	Ft. Knox	Lake Cumberland	Camp Breckinridge	Ballard Waterfowl	LBL
Rural West	154	—	260	—	12,220	5,720	8,060
Urban West	88	—	—	—	24,166	12,083	2,248
Rural Central	89	—	38,520	6,120	—	—	—
Non-resident	27	—	13,890	—	—	—	1,389
Louisville	145	3,437	13,059	—	—	—	458
Rural Bluegrass	162	7,293	1,105	2,210	221	—	—
Urban North	116	707	606	—	101	—	—
Lexington	47	1,620	180	180	—	180	—
Rural Mountains	204	101,175	—	23,940	—	—	—
Ashland-Greenup	36	1,798	—	—	—	—	—
Total		116,030	67,620	32,350	36,708	17,983	12,155

TABLE IV—USE OF LESSER PUBLIC HUNTING AREAS.

Wildlife Area	Hunters	Trips
West Kentucky	2,747	7,159
Fort Campbell	1,811	9,762
Pine Mountain	1,140	19,950
Knob State Forest	1,096	2,700
Dewey Lake	885	1,140
Blue Grass Depot	802	802
Lake Barkley	752	985
Kentucky Lake	741	3,770
Nolin Reservoir	687	687
Buckhorn Reservoir	570	1,710
Green River Reservoir	540	2,700
Mullins	524	2,039
Barren Reservoir	492	752
Rough River Reservoir	458	1,375
Henderson Sloughs	281	1,686
Grayson Reservoir	285	855
Fishtrap Reservoir	285	855
Robinson Forest	285	570
Pennyrile State Forest	260	780
Lloyd	221	442
Central Kentucky	101	202

Acquaintance Through Hunting: Forty-seven percent of the hunters hunted where they had taken the precaution of finding out who owned the land and obtaining permission. This was the third largest group of hunters, but this class of land provided fewer trips (14%) than land owned by the hunter.

In the Lexington, Ashland-Greenup and Urban North subsamples, 56% to 60% obtained hunting privileges this way.

The Hunter's Own Land: Eighty thousand hunters (33%) used their own land and this accounted for 16% of all hunting trips. This was highest in the mountains, including Ashland-Greenup, and in the Rural West subsamples. Land is cheaper in these areas.

Hunting on their own land was lowest among non-residents and hunters from Louisville, Lexington and Urban North Kentucky.

Farmers are permitted to hunt without a license on land on which they live. Many hunters were thus excluded from this survey.

These 80,000 landowning hunters could improve their own hunting if someone could persuade them that it's worthwhile. Another 130,000 hunters used land owned by relatives or close friends. This is 84% of all Kentucky hunters who probably have access to land on which they could produce more game for themselves.

Public Hunting Areas: Non-residents used public hunting areas to a greater extent than any other hunters. Next highest percentages were in the Rural Mountain and Urban West subsamples. Public hunting land is most abundant in these areas.

Lowest use was by hunters who live farther from public lands—Lexington, Urban North, Rural Bluegrass and Ashland-Greenup.

This points up a very significant fact about public hunting areas. They only benefit those people who are willing to travel the distance from their homes to the area and only a small percentage are willing to travel far.

Almost one-third of the non-residents hunted on Fort Knox.

Public hunting areas are expensive. In 1961-62, operating costs for the West Kentucky Wildlife Area amounted to \$8.15 for each unit of game harvested, and \$14.25 per hunter day. You can't do much of that on a \$4 license.

Nevertheless, public hunting areas appear indispensable. We need to promote hunting, just as we do fishing and tourism. And the only safe place to encourage hunting is on a public hunting area. Otherwise, local farmers complain bitterly.

Fee Hunting: Hunting fees were paid by 9% of the Lexington hunters and 5% of the Louisville hunters. Lowest percentage was in the mountains and bluegrass. Only 2.4% of the state sample paid a fee for hunting on an indicated 15,886 hunts. Of these 2,477 were on licensed shooting preserves. Shooting preserve records show 2,517 hunter days. This probably was more coincidence than accuracy.

Dog Training: Twenty-six percent of the sample indicated trips for dog training. Their trips were equal to eight percent of the hunting trips.

Field trial areas are intensively used for dog training, although this use did not appear in this survey.

Field Trials: None of the 1,068 replies indicated participation in field trials. Considering the widespread popularity of this activity and the large number of field trial clubs, this was surprising. This is particularly interesting since the Game Division operates three large field trial areas.

HUNTERS AND HUNTING

As biologists, our interest in hunters should be similar to Chrysler Corporation's interest in motorists. Hunters are the clients who support our business. If this survey is accurate, 92% of our business is selling annual licenses to hunt on private land.

The Average Hunter

Wildlife biologists and administrators have worked with hunters so long that we have developed a definite picture of the average. We have checked them in the field. We have attended sportsmen's club meetings. We have read survey reports indicating that they average 13 hunting trips per year. These impressions, though, are all heavily weighted by a minority of enthusiastic hunters who are above the average. According to the National Survey of Fishing and Hunting, 25% of the hunters make one or two trips per year. The median of the other three-fourths is eight or nine trips per year instead of 13.

Less than 16% of Kentucky hunters belong to sportsmen clubs.

Field checks are designed to collect the maximum amount of information. This means checking the best areas and the best hunters instead of the average.

The 25% of the hunters who hunt less than three times per year could be very easily priced out of the hunting license market. They don't matter much to anybody except the state game agencies. They accounted for only five percent of the hunting and one percent of the hunting expenditures.

Mobility.

In Kentucky, the population is most concentrated in Louisville, Lexington and the three northernmost counties. One reason for the low percentage of hunters in these populations may be the scarcity of nearby hunting opportunity and the low mobility of potential hunters.

In the 1963-64 season, only 43% of Kentucky hunters went outside their home counties to hunt. These longer trips amounted to only 28% of the total.

When these figures are applied to a large city, which has little or no hunting opportunity within the county, it may mean that half of the potential hunters just do not hunt nor buy licenses.

LANDOWNERS

Even though 92 percent of the hunting is on private land, that is the last place we, as biologists, want to work. It has been thoroughly demonstrated that you can't get a high percentage of farmers to improve wildlife habitat. (Demonstrations of failure are not always conclusive.) On the other hand, we can manage the habitat on a single waterfowl area and achieve fantastic increases in huntable game. We can produce big deer herds by simply stocking an unoccupied favorable area. More recently, we have provided increased small upland game on public hunting areas.

Farmers and Wildlife.

But 92% of our hunting is too much to ignore. In some manner or other, we have to maintain this hunting on private land, or go out of business. We know that this is difficult and unproductive. Land-owners are primarily interested in timber, beef, corn, tobacco or other economic products. Game is incidental.

Farmers undoubtedly have caused much of the decline in game by more intensive use of the land. They have drained wetlands, harvested mast and den trees, filled open fields with pine seedlings and cleaned up a vast acreage of good wildlife cover. Farmers have to do some of these things in order to make a living. But even the most generous biologist can see no justification for federal cost sharing for drainage and some other types of habitat destruction.

With all the government payments and price supports, farmers appear to be the Great White Father's chosen people. Some of them are doing quite well, but statistics indicate that, as a group, they are in a sad plight.

Agricultural Income.

By 1965, there were 133,038 farms in Kentucky. They sold \$702,-767,000 worth of products, or an average of \$5,284. They also received an average of \$300 in federal payments. Production costs averaged \$3,675 per farm. This leaves an average disposable income of \$1,909 per farm.

Foresters and agricultural technicians have been responsible for a great deal of the intensified farming and habitat destruction. Isn't it natural, though, that anyone working with a group of people whose average income is less than \$2,000 per year would try to increase their income first?

Farmers Contribute to Game Management.

State game agencies are financed by hunting license fees. But how many of these fees are paid for that purpose? Most hunters buy a license only because they expect to get their money's worth from hunting, and in Kentucky, 92% of that hunting is on private land. Therefore, the farmer really is the one who provides most of the basic resource that supports the Game Division.

According to the National Survey of Fishing and Hunting, 28% to 30% of the farmers hunt. Of the entire labor force, only 14.4% hunt. One-third of Kentucky hunters own land.

Towns and rural areas had 14.2% hunters, while small cities had 6.8% and big cities 3.4%. So, farmers and rural people are our best customers. These data imply that as our population becomes concentrated in urban areas, the percentage of hunters will continue to decline.

KENTUCKY'S GAME PROGRAM

In Kentucky, the most productive game management has been on public lands in the eastern and western areas. Unfortunately, the people are most concentrated in the central and northern part of the state.

So, if we take advantage of the best opportunities for game, we simply improve hunting for the more fortunate minority. And the majority of our citizens have to do the best they can on private land.

In Kentucky last year, only 10% of the hunters bought deer permits and only three percent bought duck stamps. These species usually account for about five percent or six percent of the hunting trips. Considering this and the public hunting areas, practically all of our game management efforts are directed toward 25% of the hunters and less than 10% of the hunting.

National statistics are similar. Of 13.5 million hunters, 10.6 million hunted small game. Only 1.7 million hunted waterfowl and 6.6 million hunted big game. Of the total days of hunting, small game provided 69%, big game 24% and waterfowl seven percent. Still, most states emphasize big game and waterfowl.

There are some good reasons, though, for deer and waterfowl to receive more effort than their proportionate share of the hunting.

In 1961, Kentucky waterfowl hunters averaged 32 hunts each, including hunts for all other species. This was twice as many hunts as the average for all hunters. Such individuals as these contribute more to the P-R fund, and are more likely to continue buying hunting licenses. As individuals, they deserve more consideration than the incidental hunter. But these individuals do not buy enough hunting licenses to support their programs financially. The question is, how long will the great mass of incidental or casual hunters continue to support these programs which they do not utilize?

For some reason, hunting is declining and this is not the kind of change we enjoy. Not many biologists are anxious to change to a program emphasizing private land, where most of the hunting occurs. There is a statement, though, in the Proceedings of the Sixteenth Annual Conference of the Southeastern Association of Game and Fish Commissioners which seems appropriate here. W. N. Haynes said, "Change is the essence of Nature. It arrives with a sudden shock or treads gently, as at the turning of the seasons. It is the nature of man to recognize the effects of change but slowly, and always the unprepared suffer the inescapable consequence of change not recognized in time."

SUMMARY

Fewer hunting licenses were bought in Kentucky in 1966 than in 1957. Data and statistics on hunting were examined in a search for possible reasons. Answers from 1,068 hunters indicated that 92% of their hunting was on private land. Only 25% had used public land.

Deer permits were bought by 10% of the hunters and duck stamps by three percent. In 1963-64, only 28% of the hunting trips crossed a county line, and 43% of the hunters were involved in these longer trips.

According to the National Survey of Fishing and Hunting, 25% of the hunters participated less than three days each in 1965.

In Kentucky, the most productive game management opportunities (deer, waterfowl, public land), are in the eastern and western areas. People, though, are concentrated in the central and northern areas. By concentrating on the best opportunities, the Kentucky Game Division has directed most of its efforts to the benefit of about 25% of the hunters and 10% of the hunting. National statistics are only a little less unequal.

In 1965, the 133,038 farms in Kentucky had an average disposable income of \$1,909. Even though hunters are the clients who support the wildlife business, private landowners provided 92% of the hunting privileges, the basic resource that hunters buy. One-third of Kentucky license buyers hunted on their own land part of the time.

Hunting on private land is essential to this valuable sport and perhaps to the survival of the wildlife profession as we know it.

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