

*N. J. Periodical*

# New Jersey

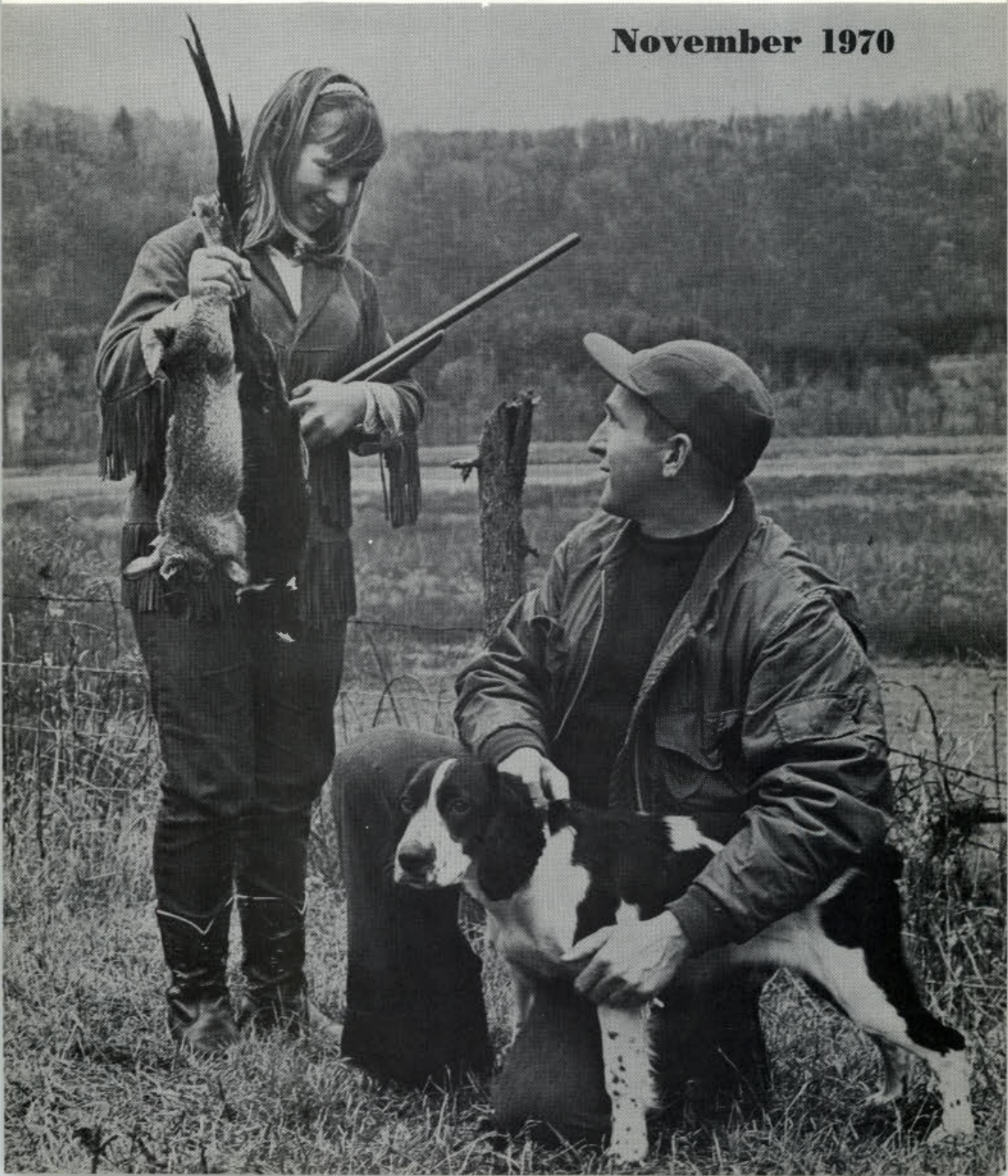
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# Outdoors

November 1970



# When Marksmanship Was in Flower

During a memorable period of international strife, one small proud nation preserved itself by resounding victories due to superior marksmanship. The nation is no longer small, its early triumphs are aged, and the world has changed—but not so much that the lesson is totally lost.

The victories were won by England, then a struggling young country, over France and Scotland in the 13th, 14th and 15th centuries. They were won with the longbow, not firearms. The principle that survives is that of civilian marksmanship training.

The essential role of civilian marksmanship in national defense continues into this nuclear age. It is, in truth, a basic means of avoiding a nuclear war by making conventional manpower effective in ordinary warfare.

What civilian marksmanship meant in the finest days of archery is well explained by Donald Featherstone, an English military author, World War II veteran and physiotherapist, in his book, *The Bowmen of England*. As he tells it:

Though nearly all the peoples of the world used bows at some time, methodical training under English law brought archery to its maximum development. Training began at the tender age of 7. Mature products of this long, careful instruction could put an arrow through a plank—or chain mail—with accuracy at ranges above 200 yds., using 6-ft. yew bows with pulls up to 100 pounds.

Regular “civilian marksmanship” sessions continued through manhood. King Edward I made archery practice compulsory by law after Mass on Sundays and holy days. To eliminate distractions, football, handball, and cockfighting were outlawed. The English concentrated on improving their aim.

“The skill and deadliness of the English archer were not a matter of chance,” Featherstone writes. “The law prescribed the bow-weights which were proper for youths of various ages, because the weapon was little use without special training.

*continued on page 31*

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# New Jersey *Outdoors*

New Jersey *Outdoors* is published by the State of New Jersey Division of Fish, Game, and Shell Fisheries of the Department of Environmental Protection monthly in the interest of the resources of fisheries and wildlife and the betterment of hunting and fishing in New Jersey.

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### Cover—"Upland Trilogy"—*Harry Grosch*

The close mutual relationship of two gunners and a good gunning dog in the uplands combine to form the pleasant theme of sportsmanship and fellowship afield. And, when some game is bagged to complete the picture, the three make a pretty happy gathering.

Vol. 21, No. 2

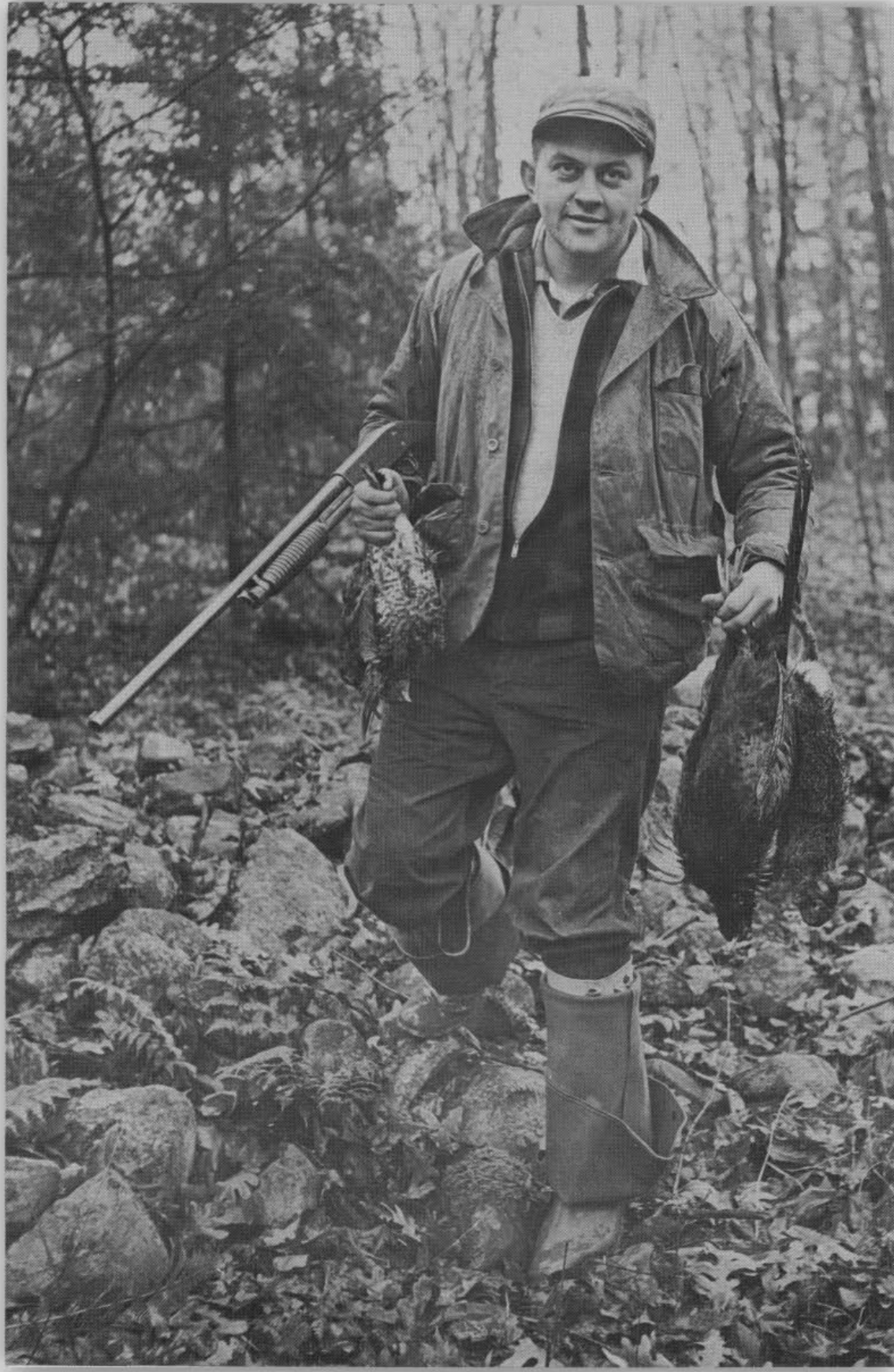
November, 1970

Publication Office: The Division of Fish, Game, and Shell  
Fisheries

P. O. Box 1809, Trenton, New Jersey 08625

Editor: R. Adams

Second-class postage paid Trenton, N. J. 08608, and additional mailing office. Application to mail at second-class rates pending at Trenton, N. J. 08608. Subscription: \$3.00 a year, by check or money order, payable to New Jersey *Outdoors*. Cash is forwarded at senders risk. No stamps please. Change of address: Should be reported directly to the Editor. Send both old and new address. The Post Office will not forward copies unless forwarding postage is provided by subscriber. Copies not delivered through failure to send change of address six weeks in advance cannot be replaced. All unsolicited material is sent to the magazine at the risk of the sender. Permission granted to reprint with credit to New Jersey *Outdoors*.



# *The Game Bags*

## **An Estimate of the Wildlife Harvest in New Jersey During 1969-1970**

By William M. Smith  
Bureau of Wildlife Management

This report pertains to the nineteenth annual survey of the small game harvest in New Jersey during the fiscal year 1969-70. It is based on a postcard survey in cooperation with the sportsmen of the state.

### **Type of Survey**

The estimate of the harvest of ten small game species during the 1969-70 hunting season in New Jersey was obtained from response to questionnaires mailed by the Division of Fish, Game, and Shell Fisheries to a systematic sample (with a random start) of resident and non-resident licensed firearm hunters in the state.

### **Sample Frame**

Hunters' names were obtained from the stubs of resident and non-resident firearm hunting licenses. These licenses were purchased during the calendar year of 1967. The frame can be used for two successive annual surveys, after which time sample size is reduced and randomness impaired, making it desirable to construct a new frame. This survey is the second "Estimate of Wildlife Harvest" to be conducted from the 1967 sample list. It is the third time this sample list has been used for mail survey information.

### **Questionnaire Form**

The 1969-70 survey form does not follow past survey forms. Two new columns were added to include; (1) the number of days spent

← *The wise hunter will study last season's bags to figure out what  
and where to hunt this year*

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hunting each game species and (2) the county principally hunted for each game species. The rest of the card follows the form of the 1968-69 survey.

The survey includes ten small game species, namely rabbit, squirrel pheasant, quail, grouse, woodcock, duck, Canada goose, brant, and clapper rail, and two big game species, deer and bear. The questionnaire recipient was asked to reply affirmatively or negatively as to whether he purchased a firearm hunting license in 1969 and whether he used the license for hunting or trapping, or for both. The recipient was asked to state the number he bagged of each game species listed, number of days hunted for each species, and county principally hunted for each game species. A separate column was provided to allow for check-marking of species hunted in New Jersey, whether or not he actually bagged any game.

### **Sample Size**

Questionnaires were mailed to 8,000 hunters selected as stated. The sample size was approximately 4.7 percent of the total resident and non-resident firearm licenses purchased during 1969 (resident 165,093, non-resident 3,116; total 168,209).

### **Unsuccessful Contacts**

A reply in some form was received from 2,669 of the 8,000 hunters and trappers with whom contact was attempted. Of the total cards (8,000) one hundred and twenty or 1.5 percent of the cards were returned by postal authorities as undelivered for stated reasons. This percentage may be compared with 0.8 percent for the 1968-69 survey.

### **Mailing Date and Response Acceptance Interval**

The questionnaires were mailed to the sample hunters near the close of the extended seasons in early 1970. Responses were accepted for 30 days, after which they were excluded from the calculations.

### **Non-purchasers of 1969 Hunting Licenses**

The number of persons who did not purchase a 1969 license totaled 447 or 16.7 percent of the 2,669 hunters with whom contact was successful. This percentage may be compared with 11.1 percent in the 1968-69 survey and 12.0 percent in the 1967-68 survey.

### **Response to the Sample**

A response from 2,135 persons of the 8,000 licenses contacted provided the requested information or 26.6 percent of the sample (two year old list). In the 1968-69 survey (first year list) the response was 31.3 percent. In 1967-68 the response was 30.6 percent (first year list).

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### **Non-use of Licenses Purchased**

Within the sample, 63 licenses purchased were not used. Therefore, approximately 2.9 percent of the 2,135 respondents who purchased licenses in 1969 failed to use them. Consequently, the participating respondents were 2,072 or 1.2 percent, of the total licensed hunters. Projecting the percentages to the total population of 168,209 licensed hunters, leaves a working population of 163,331.

### **Hunting of Game Species Not Listed**

There were 11 people or 0.5 percent of the 2,072 respondents who did not hunt any of the species of game listed. It was estimated that 830 persons hunted non-listed species only, or trapped furbearers.

### **Trapping Furbearers**

As in last year's survey, no inquiry was made as to the harvest of furbearers. The only question asked was whether the licensee used this license for hunting, trapping, or both. It was estimated that approximately 0.2 percent or 326 persons used their licenses exclusively for trapping. The persons who used their licenses for both hunting and trapping were estimated to have numbered 3,756 or 2.3 percent of the total number of licenses. Therefore, there were about 4,082 licensed trappers in New Jersey in 1969.

### **Number of Deer and Bear Hunters**

The number of firearm deer hunters in the State totaled 71.66 percent or 117,042 hunters. Of the 117,042 deer hunters, 13,703 hunted exclusively for this species. The average number of days hunted was 3.21 days per person. The number of firearm bear hunters totaled 2.6 percent or 6,846 hunters. The average number of days hunted was 3.00 days per person.

### **Statistical Treatment of the Response Data**

The 1969-70 mail survey cards were processed and the data tabulated for each game species. These figures were analyzed and applied to total hunting license sales to arrive at the estimated harvest. (Estimates are unadjusted for response bias.) To facilitate comparison with past surveys and long term harvest trends, the 1964-65 survey through 1968-69 survey was recalculated using the 1969-70 methods.

### **Distribution of 1969-70 Small Game Harvest by Species**

#### *Rabbit*

The estimated rabbit harvest in 1969 totaled 541,110 or 23,737 less than in 1968. This was a decrease of 6.1 percent over 1968. The

## . . . The Game Bags

mean seasonal take per hunter was 4.62 as compared with 5.75 in 1968. The average number of days hunted was 6.82 days per person. A total of 117,124 licensed individuals hunted rabbits or 71.71 percent of the hunters. In 1968, seventy-seven percent of participating licensees hunted rabbits.

The distribution of harvest among rabbit hunters follows:

Season bag per hunter	1969		1968	
	No. of rabbit hunters	Percent of rabbit hunters	No. of rabbit hunters	Percent of all rabbit hunters
0	28,930	24.70	25,722	21.20
1-4	49,730	42.46	48,520	39.99
5-9	19,232	16.42	22,919	18.89
10-19	14,500	12.38	16,622	13.70
20-29	3,233	2.76	4,975	4.10
30-49	1,265	1.08	2,002	1.65
50+	234	.20	570	.47
	117,124	100.00	121,330	100.00

### *Pheasant*

The survey indicates that the pheasant harvest in 1969 was 368,365 birds. This is a 22.4 percent decrease over 1968. The mean seasonal take per hunter was 2.99 as compared with 3.11 in 1968. The average number of days hunted was 6.38 days per person. A total of 123,200



*Pheasants were the most popular game birds hunted*

licensed individuals hunted pheasants in 1969 as compared with 126,078 in 1968. Seventy-four percent of all licensed hunters sought pheasants in 1969, 80 percent in 1968, and 71 percent in 1967.

The distribution of the harvest among pheasant hunters follows:

Season bag per hunter	1969		1968	
	No. of pheasant hunters	Percent of all pheasant hunters	No. of pheasant hunters	Percent of all pheasant hunters
0	46,114	37.43	46,296	36.72
1-4	50,919	41.33	52,285	41.47
5-9	15,055	12.22	15,495	12.29
10-19	8,747	7.10	9,368	7.43
20-30	2,365	1.92	2,634	2.09
	123,200	100.00	126,078	100.00

### Squirrels

An estimated 147,275 squirrels were harvested in the 1969-70 season. This was a decrease of 122,139 squirrels or 45.3 percent. The



*Squirrels are considered to be underharvested*

mean seasonal take per hunter was 2.84 as compared with 4.39 in 1968. The average number of days hunted was 6.56. The estimated total number of squirrel hunters in the state was 51,857 as compared with 61,370 in 1968-69.

The distribution of the harvest among squirrel hunters follows:

Season bag per hunter	1969-70		1968-69	
	No. of squirrel hunters	Percent of all squirrel hunters	No. of squirrel hunters	Percent of all squirrel hunters
0	19,939	38.45	17,030	27.75
1-4	21,754	41.95	25,315	41.25
5-9	5,673	10.94	10,629	17.32
10-19	3,469	6.69	5,598	9.12
20-29	866	1.67	1,712	2.79
30+	156	.30	1,086	1.77
	51,857	100.00	61,370	100.00

## . . . The Game Bags

### *Quail*

The quail harvest in 1969-70 was estimated to have been 216,475 birds or a decrease of 37,907 (14.9 percent) over 1968. The mean seasonal take per hunter was 3.88, as compared with 3.96 in 1968-69. The average



*More than 200,000  
quail were bagged  
by gunners*

number of days hunted was 7.74. The total number of quail hunters in the state was estimated to have been 55,793 as compared with 64,238 the previous year.

The distribution of the harvest among quail hunters follows:

Season bag per hunter	1969-70		1968-69	
	No. of quail hunters	Percent of all quail hunters	No. of quail hunters	Percent of all quail hunters
0	25,693	46.05	28,521	44.40
1-4	17,496	31.36	21,372	33.27
5-9	5,200	9.32	6,970	10.85
10-14	3,705	6.64	3,488	5.43
15-24	2,204	3.95	2,287	3.56
25+	1,495	2.68	1,600	2.49
	55,793	100.00	64,238	100.00

### *Grouse*

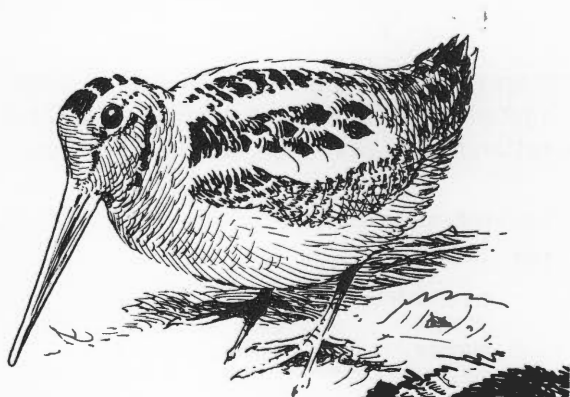
The 1969-70 estimated harvest of grouse totaled 44,515 birds. This was a decrease of 13,065 birds or 22.6 percent over 1968. The mean seasonal take per hunter was 0.79 as compared with 1.14 in 1968. The average number of days hunted per hunter was 5.93. The total number of grouse hunters was approximately 56,349 in 1969-70, an increase of 5,840 over 1968.

The distribution of the harvest among grouse hunters follows :

Season bag per hunter	1969-70		1968-69	
	No. of grouse hunters	Percent of all grouse hunters	No. of grouse hunters	Percent of all grouse hunters
0	38,142	67.69	30,114	59.62
1-4	15,840	28.11	17,714	35.07
5-9	1,972	3.50	1,600	3.17
10-14	316	0.56	687	1.36
15+	79	0.14	394	0.78
	56,349	100.00	50,509	100.00

### Woodcock

The 1969 estimated harvest of woodcock totaled 111,090 birds, a decrease of 16,524 birds (12.9 percent) over 1968. The mean seasonal take per hunter was 3.43 as compared with 3.65 the previous year. The average number of days hunted was 6.17 days per person. It is estimated



*The take of woodcock exceeded 100,000 birds*

that 32,388 hunters used their license for hunting woodcock. This is a decrease over 1968 when 34,963 persons hunted this bird.

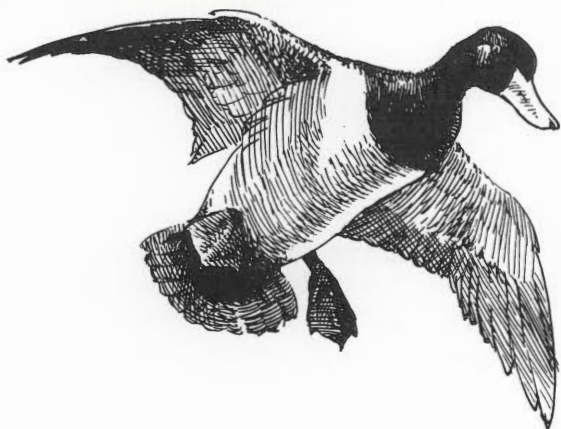
The distribution of the harvest among woodcock hunters follows :

Season bag per hunter	1969		1968	
	No. of woodcock hunters	Percent of all woodcock hunters	No. of woodcock hunters	Percent of all woodcock hunters
0	11,504	35.52	10,968	31.37
1-4	14,422	44.53	17,422	49.83
5-9	3,469	10.71	3,255	9.31
10-19	1,655	5.11	2,115	6.05
20-29	787	2.43	518	1.48
30+	551	1.70	685	1.96
	32,388	100.00	34,963	100.00

## . . . The Game Bags

### *Ducks*

It was estimated that 232,885 ducks were harvested in 1969, a decrease of 14,712 over the previous year (5.9 percent). The estimated



*Duck hunting is becoming more popular*

mean seasonal take per hunter was 6.34 as compared with 7.00 in 1968. The average number of days hunted was 5.52 days per person. The total number of duck hunters was estimated to have been 36,733 an increase of 1,362 over 1967.

The distribution of the harvest among duck hunters follows:

Season bag per hunter	1969		1968	
	No. of duck hunters	Percent of all duck hunters	No. of duck hunters	Percent of all duck hunters
0	8,515	23.18	7,202	20.36
1-4	13,322	36.27	12,514	35.38
5-9	7,090	19.30	6,285	17.77
10-14	2,917	7.94	4,228	11.95
15-24	3,075	8.37	3,427	9.69
25+	1,814	4.94	1,715	4.85
	36,733	100.00	35,371	100.00

### *Canada Goose*

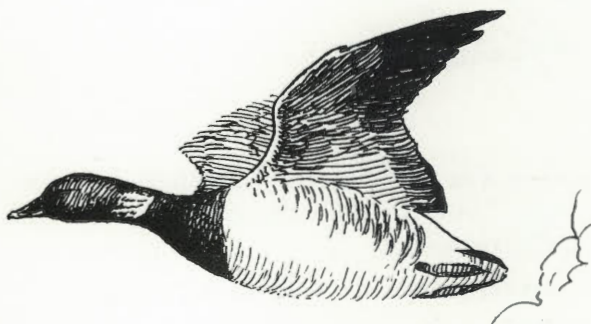
The survey data showed that the number of Canada geese harvested totaled 12,890 birds. This was an increase of 305 birds over the 1968 season total (2.4 percent). It was estimated that the mean seasonal take per hunter was 0.67 as compared with 0.68 in 1968. The average number of days hunted was 4.81 days per person. The total number of goose hunters was approximately 19,240. In 1968 the number of goose hunters was estimated to have been 18,508.

The distribution of the harvest among Canada goose hunters follows:

Season bag per hunter	1969-70		1968-69	
	No. of Canada hunters	Percent of all Canada hunters	No. of Canada hunters	Percent of all Canada hunters
0	13,168	68.44	11,995	64.81
1-4	5,283	27.46	6,056	32.72
5-9	789	4.10	342	1.85
10-14	—	—	115	0.62
15+	—	—	—	—
	19,240	100.00	18,508	100.00

### *Brant*

The survey showed that the number of brant harvested in New Jersey in 1969-70 was approximately 52,600 birds. This was a decrease of 17,921 (25.4 percent) over the 1968 estimated harvest. The mean seasonal bag per hunter was 5.22 as compared with 5.74 in 1968. The



*Brant hunters do very well in regard to season bags*

average number of days hunted was 4.25. The estimated number of brant hunters was 10,077 as compared with 12,286 in 1968.

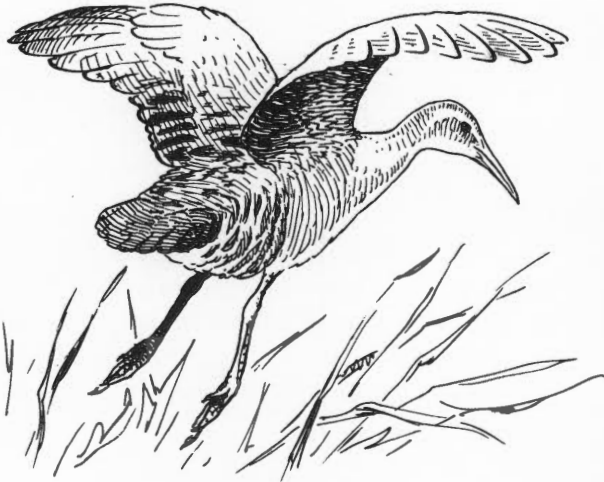
The distribution of the harvest among brant hunters follows:

Season bag per hunter	1969-70		1968-69	
	No. of brant hunters	Percent of all brant hunters	No. of brant hunters	Percent of all brant hunters
0	3,936	39.06	4,857	39.53
1-4	2,598	25.78	2,858	23.26
5-9	1,575	15.63	2,057	16.74
10-14	708	7.03	1,086	8.84
15-19	316	3.13	343	2.79
20-29	708	7.03	570	4.65
30+	236	2.34	515	4.19
	10,077	100.00	12,286	100.00

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### *Clapper Rail*

The 1969 estimate of clapper rail harvested totaled 7,995 birds, a decrease of 3,569 (30.8 percent) over 1968. The mean seasonal take per hunter was 2.75 as compared with 3.69 in 1968. The average number



*Rails were hunted by relatively few hunters*

of days spent hunting per person was 2.78. The total number of clapper rail hunters was approximately 2,907. In 1968 the hunters numbered an estimated 2 percent or 3,134 persons.

The distribution of the harvest among clapper rail hunters follows:

Season bag per hunter	1969		1968	
	No. of clapper hunters	Percent of all clapper hunters	No. of clapper hunters	Percent of all clapper hunters
0	1,414	48.65	1,311	41.82
1-4	943	32.43	1,026	32.73
5-9	236	8.11	284	9.09
10-14	158	5.41	342	10.90
15-19	78	2.70	57	1.82
20+	78	2.70	114	3.64
	2,907	100.00	3,134	100.00

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**Calculated Percent of Licensed Hunters for Each Game Species in New Jersey**

Species	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
Deer	71.54	73.71	73.23	73.01	71.44	71.66
Pheasant	76.52	77.66	75.56	71.89	80.45	75.43
Rabbit	77.92	82.56	77.75	67.98	77.42	71.71
Squirrel	43.73	43.38	37.91	34.87	39.16	31.75
Quail	37.88	39.61	38.68	35.85	40.99	34.16
Grouse	29.52	36.57	31.25	28.67	32.23	34.50
Duck	22.19	22.52	22.75	19.12	22.57	22.49
Woodcock	—	—	—	—	22.31	19.83
C. goose	—	—	—	—	11.81	11.78
Brant	6.71	6.39	7.17	6.34	7.84	6.17
Bear	—	—	—	—	3.75	2.65
C. rail	—	—	3.22	1.83	2.00	1.78

**Estimated Total Number of Licensed Hunters by Game Species in New Jersey**

Species	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
Deer	108,655	109,222	108,635	111,174	111,958	117,042
Pheasant	116,219	115,075	112,092	109,469	126,078	123,200
Rabbit	118,345	138,848	115,341	103,515	121,330	117,124
Squirrel	66,417	64,280	56,239	53,097	61,370	51,857
Quail	57,532	58,693	57,381	54,589	64,238	55,793
Grouse	44,835	61,503	46,359	43,656	50,509	56,349
Duck	33,702	33,369	33,749	31,026	35,371	36,733
Woodcock	—	—	—	—	34,963	32,388
C. goose	—	—	—	—	18,508	19,240
Brant	10,191	9,596	10,636	9,654	12,286	10,077
Bear	—	—	—	—	5,876	6,846
C. rail	—	—	4,776	2,786	3,134	2,907

**Calculated Mean Seasonal Bag Per Licensed Hunter in New Jersey**

Species	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
Pheasant	2.30	2.70	3.05	3.19	3.11	2.99
Rabbit	4.22	4.74	4.91	4.92	5.75	4.62
Squirrel	4.35	4.53	5.04	3.94	4.39	2.84
Quail	3.74	4.25	3.66	4.49	3.96	3.88
Grouse	1.18	1.32	1.20	1.10	1.14	0.79
Duck	6.23	6.23	6.86	6.65	7.00	6.34
Woodcock	—	—	—	—	3.65	3.43
C. goose	—	—	—	—	0.68	0.67
Brant	5.47	2.46	6.69	6.67	5.74	5.22
C. rail	—	—	5.33	3.17	3.69	2.75

**Estimated Harvest of Game by Licensed Hunter in New Jersey**

Species	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
Pheasant	267,303	310,702	341,880	349,206	392,102	368,365
Rabbit	499,415	658,139	566,324	509,293	697,647	541,110
Squirrel	288,913	291,188	283,444	209,202	269,414	147,275
Quail	215,169	249,445	210,014	245,104	254,382	216,475
Grouse	52,905	81,183	67,630	48,021	57,580	44,515
Duck	209,963	207,888	231,518	206,322	247,597	232,885
Woodcock	—	—	—	—	127,614	111,090
C. goose	—	—	—	—	—	—
Brant	55,744	23,606	71,154	64,392	70,521	52,600
C. rail	—	—	25,456	8,831	11,564	7,995

## Watch Your Field Manners

Very few sportsmen like to hunt alone, and most of them welcome congenial shooting partners who speak the same language. Most people are, however, somewhat reluctant to run the risk of getting

game, watch your step carefully. You can rest assured that your every action is being observed and while your friend will probably make every effort to give you the best of everything, you can just



*Few sportsmen like to hunt alone. Most welcome congenial shooting partners*

stuck for a day afield with some thoughtless or careless chap who ignores the niceties of field etiquette or violates the unwritten laws of sportsmanship. They make that mistake with the same individual only once.

If you are fortunate enough this season to be invited to go hunting with an experienced gunner who knows how and where to take

bet your bottom dollar that you're on probation with him just the same.

There are a few little courtesies which make up proper hunting demeanor and which, if observed, will put you in solid with your companion. They'll come naturally after a while, even if their importance is not immediately obvious. Your observance of them will make

the day far more pleasant not only for your host, but for you, too.

Above all, never take a chance. Observe all the rules of safety, even though your companion doesn't. You'll impress him with your caution.

Give your companion all the breaks. The accepted practice is to alternate on single shots. The easiest way to make your host angry is to try to 'wipe his eye.'

Find out which side your companion shoots from and then take the other side. Never shoot at birds flying your companion's way. It is an act of discourtesy to shoot across a gunner's front unless you know his gun is empty. Then explain your action to him.

Don't claim birds you are not absolutely sure you killed. If there's the slightest doubt, don't run the risk of being branded a 'claimer.' If your companion is

'built that way,' you'll soon find it out.

Don't try to handle your companion's dogs. And never criticize the dog's faults. Praise his good work and ignore the bad. Give the dog a chance to retrieve your bird. Look for it yourself only if absolutely necessary.

And never hunt in your friend's favorite spot which he has shown you, unless he is along or you have his consent. Violation of this courtesy has led to the ending of many fine friendships.

There is an old saying to the effect that 'if you want to find out about a man, get him in a poker game or take him hunting.' Remember it when you accept that invitation and see that you so conduct yourself as to warrant a repeat engagement. It's a safe bet that the word will get around and you won't be long lacking for gunning partners. #

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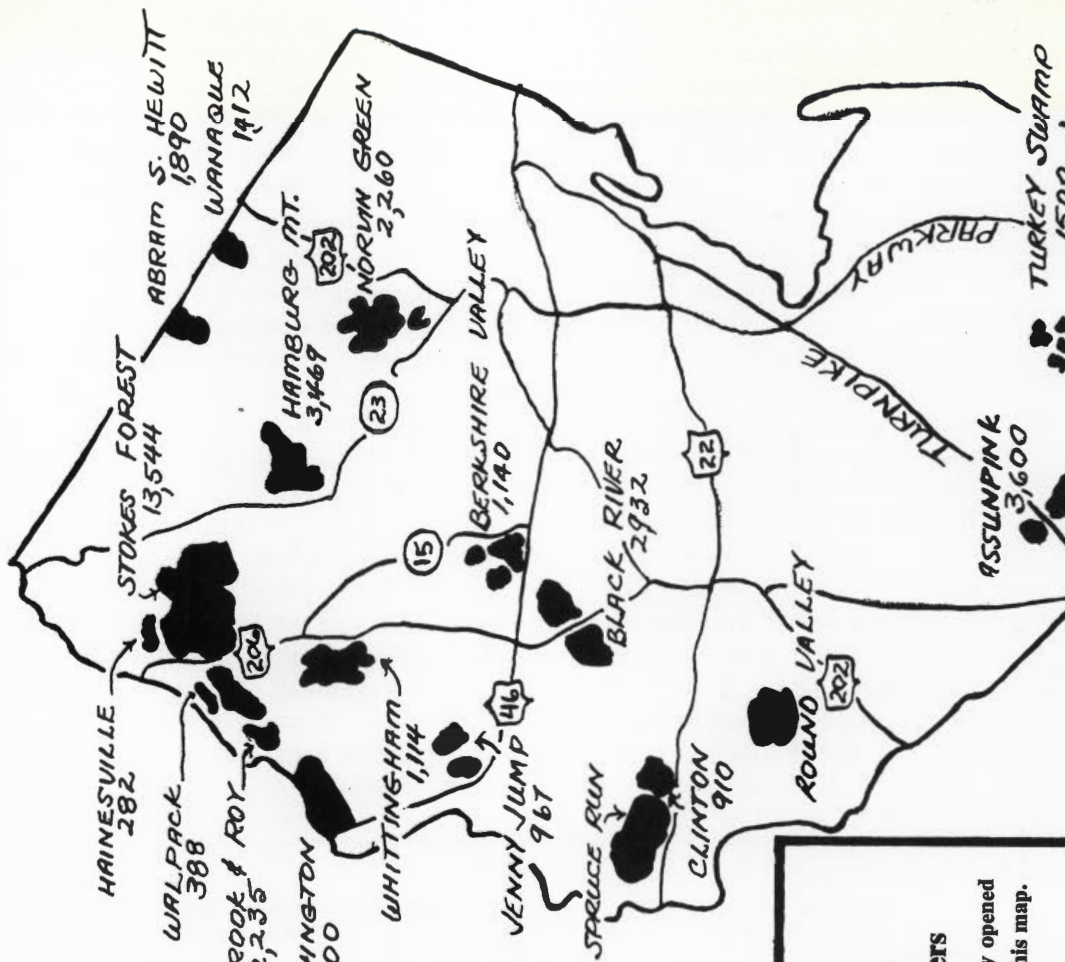
**Counties of Highest Hunting Pressure for Each Game Species Last Year**

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Species	County and Rank				
	1	2	3	4	5
Deer	Hunterdon	Warren	Sussex	Burlington	Ocean
Pheasant	Hunterdon	Sussex	Warren	Burlington	Monmouth
Rabbit	Hunterdon	Sussex	Burlington	Warren	Monmouth
Squirrel	Hunterdon	Sussex	Burlington	Warren	Morris
Quail	Monmouth	Ocean	Burlington	Atlantic	* Cumberland * Gloucester
Grouse	Sussex	Warren	Morris	Hunterdon	Ocean
Duck	Ocean	Atlantic	Monmouth	* Cape May	* Cumberland
Woodcock	Sussex	Hunterdon	Morris	Monmouth	Warren
C. goose	Ocean	Atlantic	Burlington	Cape May	Cumberland
Brant	Ocean	Atlantic	Cape May	Monmouth	Burlington
Bear	Sussex	Warren	Morris	Hunterdon	Passaic
C. rail	Ocean	Atlantic	Cape May	Burlington	Monmouth

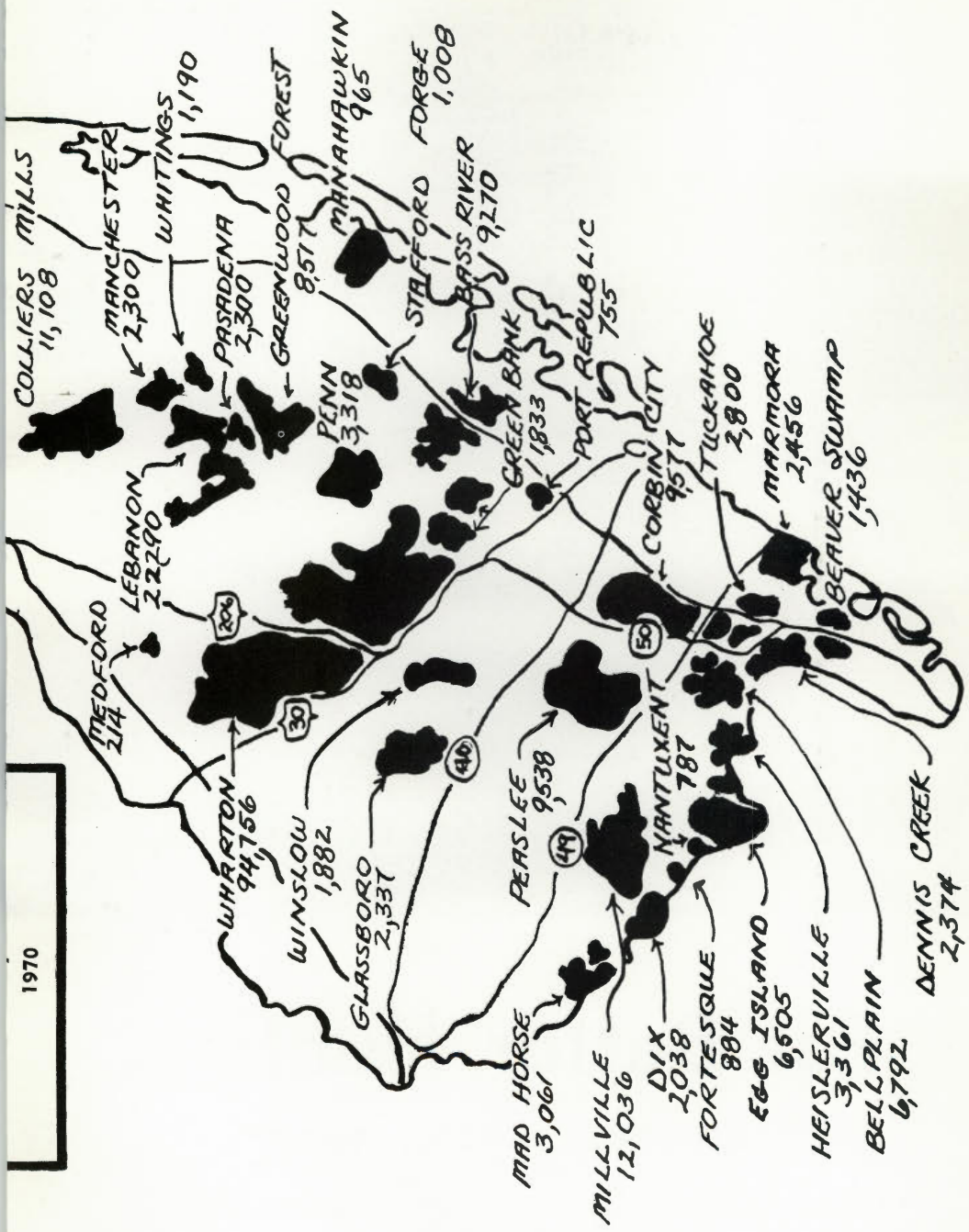
\* Counties that had equal hunting pressure reported.

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## New Jersey State Lands Open To Hunters

Newly acquired and recently opened lands are not included on this map.





# For Better Hunting

## and other outdoor sports

*Report on some of the Activities of the Bureau of Wildlife  
Management during the Past Fiscal Year*

**New Jersey continues** to offer some of the best and most diversified hunting to be found anywhere in the United States. From the Appalachian Mountains of Sussex County to the vast coastal plain of Southern New Jersey, our sportsmen can sample a wide variety of hunting and fishing. The vast Atlantic coastal and Delaware Bay and river marshes offer some of the best waterfowl hunting and the tidal bays, rivers, and ocean provide millions of man hours of outdoor recreation. All this in spite of the fact that New Jersey is the most densely populated state with the highest human population per square mile of any other state.

The complexities of the problems of endeavoring to maintain a relatively high wildlife population for recreational use, in the face of increasing urbanization, industrialization, and fast disappearing habitat, require detailed planning, administration, and long hours of field work.

### **The Bureau**

The responsibilities of the Bureau of Wildlife Management are many and varied and they are assigned to several field units. These units work together on both state-owned and private lands and they are responsible for the preparation of annual recommendations to the Fish and Game Council regarding the management and harvest of our wildlife resources.

The Bureau is charged with the management of over 135,000 acres

of wildlife management areas and for research and investigations, deer management, farm game restoration, wildlife control, game farm propagation, forest management, land acquisition, 4-H projects, and general maintenance and management duties.

In addition, the Bureau constantly cooperates with Federal and other state conservation agencies and with universities, county agencies, mosquito commissions, the Atlantic Waterfowl Council, and individuals interested in the conservation of our natural resource. Members of the Bureau participate on national, state, and local committees as part of the Bureau's contribution to the national conservation program.

As New Jersey's woodlands, fields, and wetlands shrink to the need for additional human living space, the Bureau of Wildlife Management will need to accelerate its research, management, and development programs to continue to provide outdoor recreation, not only to the license buying sportsman, but to the multitudes of citizens who enjoy nature study, picnicking, camping, hiking, and other forms of outdoor recreation on lands and waters administered by the Division of Fish, Game, and Shell Fisheries.

### **Game Farms**

Again this year, all pheasants held as breeders on both the Forked River and Rockport Game Farms were subjected to Pullorum - Ty-

## . . . For Better Hunting

phoid blood testing by veterinarians from the New Jersey Department of Agriculture. All tests proved to be negative.

At the Rockport Farm repairs to the rearing pens consisted of over 300 structural timbers being replaced together with 85 rolls of top wire and 1,000 feet of division wire. An experiment in the use of polypropylene netting for top wire was set up in one section of the rearing pen complex. Sixty-three additional nesting boxes were also constructed.

The major construction project at the Edward H. Roth Quail Farm was the salvage and preparation of materials for the construction of two new 100-foot rearing pens of the fly-way type. These pens are now under construction and should be ready for use this fall.

Construction at Forked River consisted of the replacement of large numbers of 2 x 6 timbers in the framework of the rearing pens as well as 65 rolls of deteriorated top wire. In the breeding pen unit new wire partitions were constructed and approximately fifty percent of the top wire was replaced using a polypropylene type of netting. A new roof was installed on the litter storage building which was also painted. Repairs were made to the several hundred crates presently in use at the farm.

### *Liberations*

The following game liberations

were made during the fiscal year:

**Pheasants** — 68,959 of which 66,996 were propagated at state farms and 1,963 were raised to 17 weeks of age by 10 cooperators in 3 counties from day-old chicks supplied by the state farms.

**Quail** — 21,625 of which 14,883 were raised at the state quail farm and 6,742 were reared to 12 weeks of age by 40 youth cooperators in 8 counties from day-old chicks supplied by the state farm.

### **Management Areas**

Although privately-owned lands still supply most of the hunting opportunity available throughout the state, publicity-owned lands are yearly being called upon to produce an ever larger share of the wildlife resource. The wildlife management areas in particular, through the manipulation of the food and cover available for wildlife species, are presently producing larger populations of desirable wildlife. The management activities carried out during the year in an effort to increase populations of both game and non-game species are as follows:

#### *Acres Planted*

541	hay mixtures
399	rye
164	corn
102	wheat
102	soybeans
70	food patch mix
65	oats
49	buckwheat
33	sorghum
23	Lespedeza
12	millet

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1,560 Total Acres

An additional total of 90 acres planted and left unharvested by lessee farmers.

*Other Activities*

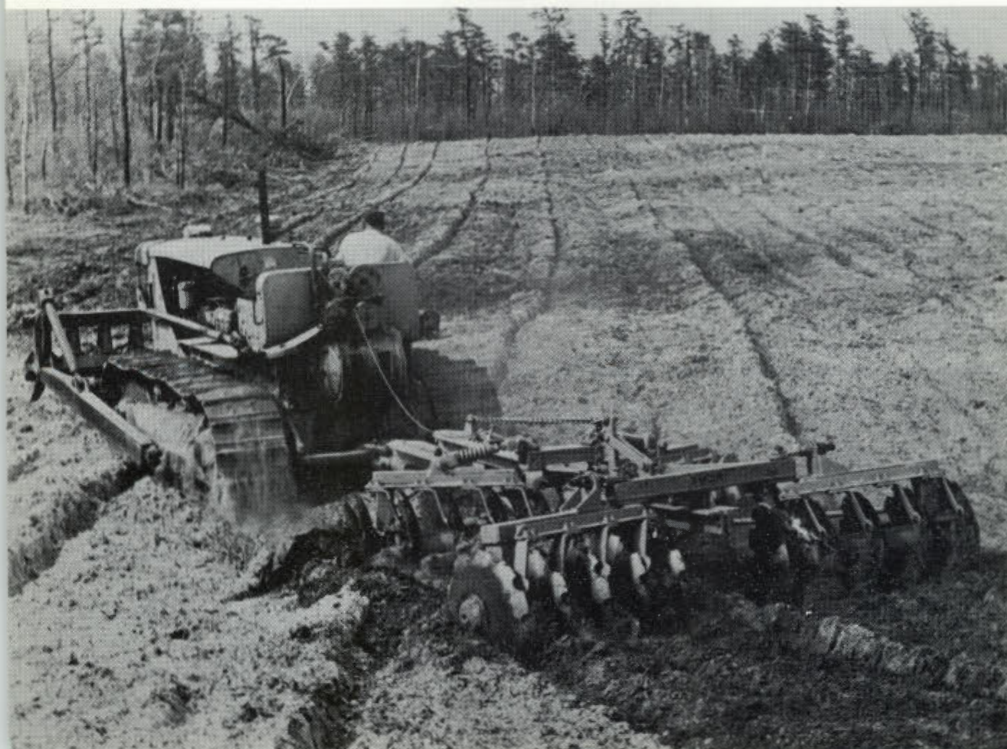
34,200 linear ft. of hedgerow and woodland border managements; 32 acres of woodland slashings and thinnings; 1,692 acres mowed (brush and field management); 5,324 cubic yards of gravel, shale and fill hauled; 85 acres new land cleared; 196 miles boundry posted; 115 acres sprayed (waterfowl management); 3.25 miles of new road construction; 30 acres old orchards restored (pruned, fertilized, etc.); 32,200 tree seedlings planted; 195,050 linear ft. of shrub hedgerows planted; .25 acres of parking area construction; 60 acres of field maintenance; 153 miles of road maintained, graded, etc.

*Heavy equipment such as this D-8 Caterpillar and bog disk harrow, make it possible to cultivate more land for wildlife plantings with less labor and equipment*

The following materials were expended on the above activities:

fertilizer .....	265 tons
ground limestone .....	510 tons
rye seed .....	731 bu.
soybeans .....	170 bu.
wheat .....	166 bu.
oats .....	105 bu.
corn .....	19 bu.
food patch mix .....	1450 lbs.
pasture mixtures .....	9250 lbs.
buckwheat .....	2480 lbs.
birdsfoot trefoil .....	625 lbs.
Lespedeza sericea .....	345 lbs.
Lespedeza bicolor .....	70 lbs.
millet .....	370 lbs.
timothy .....	400 lbs.
sorghum .....	220 lbs.

Additional accomplishments included regular maintenance work carried out on buildings, grounds, dikes, spillways, and ponds; the



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location and establishment of tract boundaries; trash and garbage removal; the construction of live traps; water control flumes, and pheasant liberation crates; the pick-up, storage, and transportation of road killed deer to selected processors; plus other activities related to the fish and wildlife resource. The use of the wildlife management areas for other than hunting and fishing oriented activities increased during the year, and more of the Wildlife Management Bureau's time was taken up servicing these uses. Camping, hiking, horseback riding, and bird watching are examples of forms of outdoor activities which have greatly increased on the wildlife management areas in recent years.

### **Game Habitat**

The Farm Game Habitat Restoration unit is charged with the responsibility of supplying technical advice, as well as certain material assistance, to private landowners interested in increasing the supply of desirable wildlife on their lands. Sportsmen clubs, farmers and interested landowners were contacted regarding wildlife habitat improvement practices and a total of 264,250 tree and shrub seedlings were supplied to cooperators who are carrying out wildlife development practices. Some 11,800 pounds of seed, primarily New Jersey food patch mixtures, Lespedezas and small grains, was also

distributed to cooperators who are conducting their own wildlife food patch planting programs. The unit supervised activities related to wildlife being carried out under the U. S. Department of Agriculture's ASCS Programs. Cooperation was given the Lakehurst Naval Air Station and the Earle Naval Ammunition Depot in the management of wildlife habitat on federally controlled lands. Controlled hunts, held to harvest the surplus game population, were supervised on both the Earle and Lakehurst Areas.

Practically all of the actual planting, mowing, woodland cutting, and other management activities carried out by the unit during the year took place on the various wildlife management areas located throughout the state.

### **Research and Investigations**

#### *Waterfowl Surveys*

Monthly fall and winter waterfowl inventory flights were conducted along the Atlantic coast and the Delaware River and bay marshes in New Jersey to determine the arrival and departure dates and to gather information on the migrating and wintering waterfowl in New Jersey. This information provides the basic data required to establish waterfowl hunting seasons and to evaluate our waterfowl population, quality of the habitat, and waterfowl management program. During January the Bureau conducted the Winter Waterfowl Trend Survey in coop-

### Winter Waterfowl Survey

Mallard	5,600	
Black Duck	68,700	
Gadwall (Grey duck)	100	
Baldpate (Widgeon)	4,100	
Blue-wing Teal	0	
Green-wing Teal	300	
Shoveler (Spoonbill)	400	
Pintail (Sprig)	1,700	
Wood Duck	0	
Total Puddle Ducks	80,900	(1)
Redhead	200	
Canvasback	6,500	
Scaup (Bluebill)	81,700	
Ringneck (Blackjack)	0	
Goldeneye (Whistler)	3,935	
Bufflehead		
(Butterball)	15,925	
Ruddy Duck	1,300	
Sub-Total Diving Ducks	109,560	(2)
Old Squaw	3,300	
Scoter	69,100	
Eider	0	
Sub-Total Sea Ducks	72,400	(3)
Merganser	3,525	(4)
Total Diving Ducks		
(2), (3), (4)	185,485	(5)
Total Ducks		
(1), (5), (6)	266,385	(7)
G. Snow Goose	1,700	
Canada Goose	5,050	
Total	6,750	(8)
Brant	96,100	(9)
Coot	0	(10)
Whistling Swan	65	(11)
Grand Total		
(7), (8), (9),		
(10), (11) .....	369,300	

eration with the Bureau of Sport Fisheries and Wildlife as New Jersey's contribution to the national winter waterfowl trend studies.

### Waterfowl Banding

Waterfowl biologists banded a total of 4,459 waterfowl and rail during the year. The state banding total was: black ducks 2,400, greater scaup 689, lesser scaup 173, mallards 307, wood ducks 159, canvasback 22, redhead 9, pintail 49, black mallard hybrids 13, baldpate 4, greenwing teal 3, bufflehead 1, Canada geese 74, clapper rail 554, king rail 2. In addition assistance was given to the U. S. Game Management Agent at the Brigantine National Wildlife Refuge in trapping and banding 200 Canada geese.

During November and December a cooperative woodcock banding operation was conducted between the state and Federal biologists. On thirteen night banding trips a total of 342 woodcock were banded in Cape May County.

### Rail and Woodcock

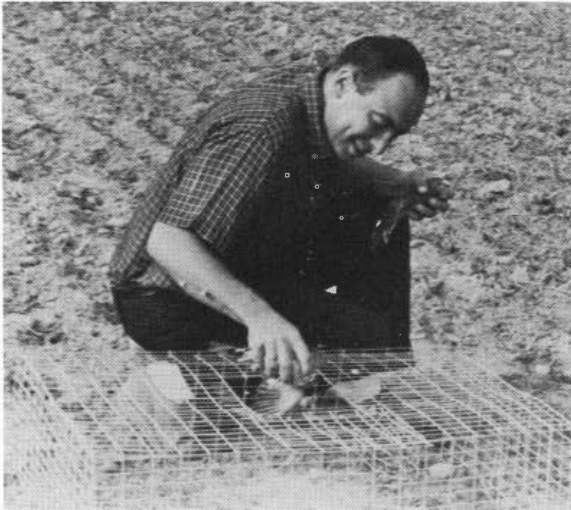
To evaluate the annual trends of the clapper rail population, five study areas were maintained; two near Tuckerton and three on the Brigantine National Wildlife Refuge. Final nesting data is not available at the time of this report. However, field studies indicate that the 1970 breeding and nesting efforts were substantially increased over the last three years. The breeding pair count indicated that

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the 1970 population on the study areas was 19 birds compared to 4 in 1969 and 8 in 1968.

The annual woodcock singing ground census was conducted in cooperation with the Bureau of Sport Fisheries and Wildlife. Twelve randomized routes in the woodcock nesting habitat through-

status and management of these species. Efforts were directed toward developing a new clapper rail census technique using electronic equipment. A total of 460 clapper rail were banded, mostly by air boat. Clapper rail hunter bag checks on opening day, September 1, showed 61 hunters bagged 11 rail on opening day. An aerial survey on the same day indicated that



*Studies were conducted to provide information on the status of such birds as woodcock, rails, and doves. Trapping doves for banding*

out the state were inventoried and field data indicated that the breeding woodcock population increased from a total of 27 birds in 1969 to 36 birds in 1970 on the census areas.

### *Rail and Dove Study*

Under a congressional grant for an accelerated program of research and management of shore and upland migratory game birds, an intensive clapper rail and mourning dove research project was conducted to provide information on the

83 hunters were on the tide marsh between Barnegat Inlet and Cape May Point. A total of 8 banded clapper rails were reported shot; 1 in Mantoloking, N. J., 1 in Virginia, 4 in Georgia and 2 in Florida.

The breeding pair survey indicated more rails present than in the past two years. In 1968 there were 29 pairs; 1969-37 and in 1970-49 pairs on the two census areas.

Summer 1970 production figures of young birds are not available, but present data indicate that 1970 will be superior to the past three

years in annual production of clap-net rail.

A total of nine mourning dove banding stations were operated throughout the State and 1,237 doves were banded during the pre-season period of June through August. During the post-season period, January through March, a total of 182 doves were banded.

### *Waterfowl Harvest*

To evaluate the recreational value of tidal marsh to waterfowl hunting, a total of 42,667 acres of marshland and 29,804 acres of bay and sounds were surveyed. Field work indicated that these areas provided 9,371 man days of recreation and a harvest of 8,867 ducks and 12,509 brant. On the Jenkins Sound Area hunters spent 564 days to harvest 570 ducks and they hunted 755 days to harvest 881 brant. On the Grassy-Richardson Area waterfowl hunters expended 495 days to collect 683 ducks and 626 days to shoot 927 brant.

### *Mosquito-Wildlife Studies*

Long range mosquito-wildlife plans based on intensive marsh surveys indicated the need for mosquito control on specific trouble areas rather than large scale broad marsh applications. Present plans call for open marsh management to replace insecticide contamination. Quality ditching, dike removal, creating improved water circulation have resulted in the elimination of mosquito breeding areas without the use of pesticides. This type of management has resulted

in greater wildlife and human utilization and also protects the tidal web food chain from the dangers of chemical contamination. Detailed charts have been prepared and the Bureau is working with State and local mosquito commissions toward a more progressive mosquito-wildlife management program.

On the Manahawkin Wildlife Management Area a cooperative study is being conducted to develop a better wildlife management and mosquito control program through the use of low level impoundments maintained at various water levels. The data shows that by maintaining a constant water level over the marsh which once produced large numbers of mosquitoes, that the mosquito breeding can be eliminated and that desirable waterfowl food and cover plants will become established.

A cooperative development project between the Ocean County Mosquito Commission, the State Mosquito Control Commission and the Division of Fish, Game and Shell Fisheries was inaugurated this year on the Manahawkin Wildlife Management Area. This included the digging of a 2,500 foot ditch and the installation of water control structures which made it possible to channel a fresh supply of water into the reservoir pond and the other impoundments. In addition, two new, low level, impoundments were constructed having a total of 92 acres.

A scientific paper "Preliminary Investigation of the Effects of

## . . . For Better Hunting

Open Marsh Management on Salt Marsh Organisms" was presented at the Atlantic City meeting of the New Jersey Mosquito Extermination Association.

### *Herbicide Studies*

Sixty experimental plots were established to test various herbicides and application rates on cattail and foxtail. Cattail was most sensitive in the flowering stage. Sixty-two acres of cattail and 51 acres of foxtail in eight impoundments were treated by helicopter. About 99 percent control was observed on the cattail and 97 percent on the foxtail.

### *Water Level Management*

Water level management continues to be an economical and effective tool in managing our fresh and brackish water impoundments. At Tuckahoe impoundments the water chemistry, conditions, wildlife utilization and plant succession studies are continuing on nine state-owned impoundments. Those impoundments managed by water level fluctuation showed an increase of from 0.2 waterfowl per acre in 1968 to 36.1 ducks and 6.7 geese per acre in 1969.

On the Colliers Mills Wildlife Management Area a total of 14 small lakes and ponds are under water level management. The partial draw-downs with applications of fertilizers and lime have continued to provide superior waterfowl food and cover plants. Experi-

mental work on basic soil chemistry and the evaluation of the nutrient value of several of the more important waterfowl food species has led to an improvement in the overall management program.

### *Pheasant and Rabbit Census*

The 1970 Pheasant Crowing Cock Survey indicated a drop of approximately 25 percent from the 1969 census in the number of cocks recorded state-wide. The largest drop, 30 percent, occurred in the primary pheasant range of Central Jersey which has shown increasing numbers of breeding males present since the survey was inaugurated in 1966. The number of birds censused remained approximately the same or increased slightly in the marginal areas of North and South Jersey.

Results of the 1969 cottontail rabbit roadside census indicated a slightly larger rabbit population state-wide when compared with last years survey. The 1969 state-wide totals were 7 percent above the 1968 figures and showed a large increase, 40 percent, over the 1967 results.

### *Soils Research and Habitat*

Studies on low quality soils of the light coastal plain continue in cooperation with Dr. Stephen Toth of the Soils Department of the New Jersey Agricultural Experiment Station at Rutgers University.

These studies include the evaluation of the B-horizon soils and their productivity. Work indicates that the B-horizon produces three



*Since wildlife is a product of the land, soils research is an important program of the Bureau. Here Dr. Stephen Toth shows the results of adding river sediment to the sandy soils on the Colliers Mills Wildlife Management Area*

times the yield of the A soil. Fertilizer application in relation to yield of smartweed showed that an increase of from 16 pounds to 56 pounds per acre could be expected with application of the proper fertilizers. Green sand studies show a gradual reduction in plant production after four years of annual planting.

Cooperation with the plant material section of the Soil Conservation Service continues to investigate the opportunities for new food and cover plants on the light coast-

al plain soils. Test plots have been established on coastal panic grass, switch grass and proso millet.

A contracted research project with Rutgers University on the productivity and general life history of the scrub oak and related oaks in the light coastal plain was continued and basic information and observations are being prepared for presentation.

Bureau scrub oak management studies began on Greenwood Forest. A total of 16 acres of scrub oak was mowed, brush hogged,

## . . . For Better Hunting

disked, and treated with brush-breaking barrels. Various fertilizer and lime applications were applied to investigate the mechanical and chemical treatment on the annual growth and acorn production of this important species.

### **Plans and Publications**

Four comprehensive long-term wildlife management plans have been prepared for Colliers Mills, Greenwood, Peaslee, and Millville Wildlife Management Areas. The plans include overlay maps showing long term and short term development, land acquisition, boundary lines, and multiple use recreation. Fifteen other long term plans are in various stages of preparation.

A total of 34 wildlife management area guide brochures were prepared and published for distribution. These include a map of the area, general description of the hunting and fishing, and directions on how to reach the various wildlife management areas.

A 34 page, two color booklet, "What's Hunting Worth in New Jersey" was prepared and published. This publication summarizes several years of research and provides information on the economic importance of hunting in New Jersey.

### **Cooperative Activities**

One full time wildlife biologist is assigned to the State Department of Health to work on wild-

life problems as they relate to public health. Throughout the year members of the Bureau constantly cooperated with agencies such as the Soil Conservation Service, the Agricultural Stabilization and Conservation Program, the U. S. Army, and U. S. Navy on management activities on the military reservations in New Jersey, the Bureau of Sport Fisheries and Wildlife, the Atlantic Waterfowl Council, state and local mosquito control commissions, in addition to other state and department and division agencies.

### **Assistance**

Over sixty talks were given to professional and lay groups interested in wildlife management, and many tours were conducted on the various wildlife management areas. Assistance was given to graduate and undergraduate college students working on specific problems on state lands, and assistance and advice was given to farmers, land-owners, and others who requested professional help.

### **Other Activities**

In addition to the above activities the Bureau of Wildlife Management performed such diversified work as Green Thumb Projects an estimate of the game harvest for the year, wildlife control services, recording of the beaver harvest, deer research and management, and land acquisition operations, which will be considered separately at various times and places. #

## Hunt Safely This Year

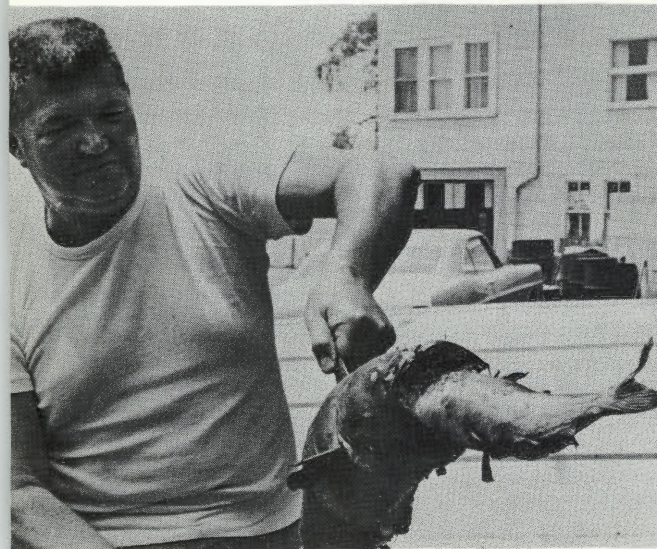
No matter how you look at it there will be a lot of people afield this fall hunting season. With as many hunters as New Jersey must accommodate on limited areas, accidents are always a risk. The shooting sports have a very good overall safety record, but even one mishap is a tragedy to the victim and his family. This is particularly true since accidents don't just happen—they are *caused* by carelessness.

The rules of safe gun handling have been stressed over and over again, but they can't be reviewed too often. In essence they are:

Treat every gun with the respect due a loaded gun. Never point a gun at anything you do not want to shoot. Never climb a fence, wall, or tree with a loaded gun. Carry only empty guns, taken down or with the action open, when entering your home, camp, or automobile. Whenever you pick up a gun, point it in a safe direction and then examine it carefully to be sure it's unloaded. Never shoot at anything you cannot clearly see and identify. Avoid all horseplay with firearms and, above all, **WATCH THAT MUZZLE!** Do not load your gun until you are ready to enter the field, woods, or duck blind where you will be hunting. Always be sure that the barrel and action are free of obstructions. Always be sure that you keep the safety on until you are ready to shoot. Above all, remember that safety in the hunting field or on target ranges is 99 percent common sense. #

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## More Than He Could Chew



*Dick Dow of Nolan's Point, Lake Hopatcong, with a 12-pound channel catfish that succumbed to gluttony when it tried in vain to swallow another channel catfish of two pounds weight*

## How about Shooting Preserve Hunting?

Considerate behavior and some attention to the common courtesies of good landowner relations can often open up posted rural acreage to hunting. But for those unfortunates who are being hemmed in by New Jersey's ever-spreading urban sprawl, the problem is far more serious. There is something awfully final about losing your favorite grouse cover to bulldozers and concrete.

The apparent result, of course, is that the urban dweller has to travel increasingly greater distances to find a place to hunt. But does he, though? One answer to his problems can be found in shooting preserves. The facilities in many cases are located within fairly close range of major population centers.

Some sportsmen worry about the artificial nature of preserve hunting. But it can be just as sporty as any hunting. Sure, the birds are put out for you but a good preserve operator has cover that rivals the best natural habitat. On top of that, he uses retrievers and can guarantee the birds are there. The only thing he can't do is offer insurance you'll hit them when they flush.

The variety of game offered by preserve operators includes pheasant, quail, mallard ducks, and chukar partridge. Of course not all species are found on all preserves but many offer three or four, and most have at least two. Prices and standards do vary, depending on the services and facilities offered. Some charge by the number of birds bagged and others by the number released. Most operators clean and package the birds you bag and the seasons run long. Whatever the facilities, it pays to make reservations in advance. #

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### Smoke Gets In Your Eyes

*These days, everybody's for conservation. The movement's oldest, most powerful enemies have raised such a public relations smokescreen you need a score card to tell the polluters from the polluted upon. Fact is, however, everybody's for conservation as long as someone else has to do the conserving. Like the middle-aged fellow driving the late model, 4 door, powder blue Falcon with Maryland license number A W 9861, He's for conservation. You can tell by the bumper sticker "Pounce on Polluters." Commuting into Washington, D. C., this conservation advocate—balding; wears glasses—pulled up to a stoplight and proceeded, to dump his ashtray full of garbage into the street. But he's for conservation. Just ask him. And so are all the bigtime polluters. Just ask them.*

## ... Marksmanship

*Continued from Inside Front Cover*

"Bishop Latimer (Hugh Latimer, 1490-1555) wrote: 'My father was diligent in teaching me to shoot with the bow; he taught me to draw, to lay my body to the bow, not to draw with the strength of the arm (only) as other nations do, but with the strength of the body. I had my bows bought me according to my age and strength; as I increased in these my bows were made bigger and bigger.'"

Longbowmen thus trained won over the French, who relied largely on hired Genoese crossbowmen, and the Scots, who drew "only with the arm to the chest." The list of victories, Falkirk, Sluys, Crecy, Agincourt, Flodden Field and many more, attests that marksmanship paid off centuries ago as it has many times since.

The last known use of the longbow in battle occurred almost sym-

bolically at one of Britain's darkest hours. On May 27, 1940, Featherstone reports, Capt. Jack Churchill of the Manchester Regiment, an international archery competitor in peacetime who had taken his yew bow to war, killed a Nazi with a single arrow in covering the Dunkirk retreat.

King Edward I's law requiring marksmanship practice after Mass has long since fallen into disuse. Some influential people in both Britain and the U. S. profess to see no point to marksmanship or aimed fire in this nuclear age. National marksmanship competition at Britain's Bisley and America's Camp Perry has been given the governmental cold shoulder. There are persistent attempts to downgrade the need for accuracy with small arms. These, if successful, could damage the defense potential of the Free World. They might even make it necessary to resume practice with the longbow after prayers—and to do a lot of praying, too. #

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# Hunter Orange

Red is no longer the safest color for a hunter to wear in the woods.

Science has come up with a color which is reducing hunting accidents each year. It's hunter orange. This fluorescent color was labeled most visible after tests by the United States Army, Harvard University, and the Massachusetts Department of Fisheries and Game. Hunter orange stood out like a beacon in situations where other colors blended into the background. During the hours of dusk and dawn, when other colors tend to fade, hunter orange is highly visible.

Massachusetts, Maine, Colorado, and Iowa have made hunter orange clothing mandatory for big game hunters. These states have greatly reduced accidents in the "Mistaken for Game" and "In the Line of Fire" accident categories.

Upland and big game hunters should give hunter orange a try this season. It's a courtesy for other hunters. #

