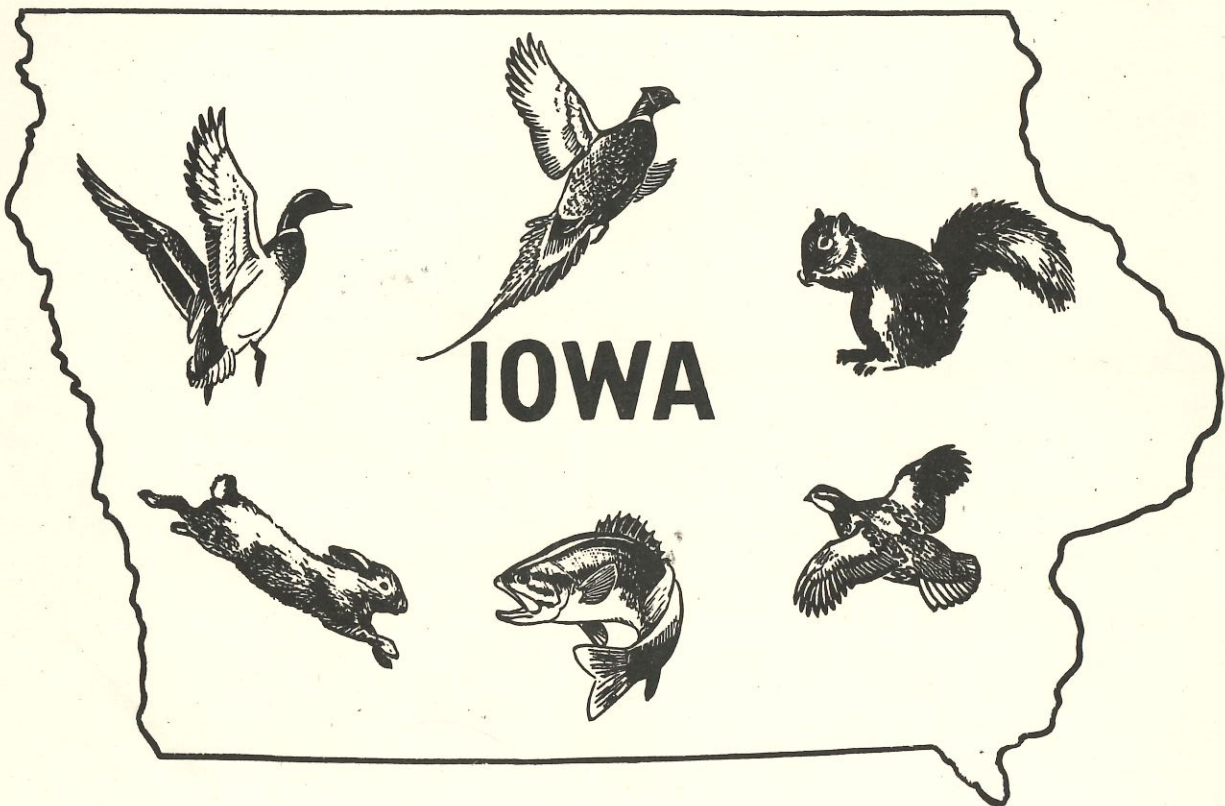


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QUARTERLY BIOLOGY REPORTS



FISH AND GAME DIVISION — BIOLOGY SECTION
STATE CONSERVATION COMMISSION

QUARTERLY BIOLOGY REPORTS

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TABLE OF CONTENTS

ABSTRACTS

ABSTRACTS OF ALL PAPERS PRECEED THE PAPERS IN
THE REPORT (Page I-V)

GAME

PAGE NO.

1. RESULTS OF THE 1961 IOWA SHOTGUN SEASON FOR DEER .
By Eldie W. Mustard 1-5
2. IOWA QUAIL HUNTING, 1961-1960.
By M. E. Stempel 7-9
3. SEX RATIOS OF PHEASANTS OBSERVED DURING WINTER COUNT - 1962.
By Richard C. Nomsen 10-12
4. WINTERING OF WILD TURKEYS IN YELLOW RIVER FOREST AREA.
By Eugene D. Klonglan 13-15
5. RESULTS OF SEMI-CONTROLLED HUNTING UPON THE HARVEST OF WATERFOWL
AT LAKE ODESSA, IOWA, 1960 and 1961.
By James G. Sieh and William Aspelmeier
(Refer to Abstracts)
6. VERNAL BREEDING OF COTTONTAILS IN IOWA.
By Paul D. Kline
(Refer to Abstracts)

FISHERIES

1. FURTHER NOTES ON THE EFFECTS OF MECHANICAL REDUCTION ON THE GROWTH
OF CRAPPIES IN BACKBONE LAKE, IOWA.
By Roger Schoumacher 16-25
2. THE 1960 and 1961 CREEL CENSUS ON TEN STREAMS AND FOUR LAKES IN
WESTERN IOWA.
By Bill Welker 26-29
3. PLEASURE BOAT NUMBERS AS COMPARED TO FISHING BOATS ON THREE NATURAL
LAKES, SUMMER, 1961.
By Tom Moen 30-31
4. CREEL CENSUS OF DES MOINES RIVER FISHERMEN IN BOONE, DALLAS, AND
POLK COUNTIES, IOWA.
By Harry M. Harrison
(Refer to Abstracts)
5. THE CONTROL OF NUISANCE AQUATIC VEGETATION WITH BLACK POLYETHYLENE
PLASTIC.
By Jim K. Mayhew and Sylvan Runkel
(Refer to Abstracts)

TABLE OF CONTENTS
(Continued)

CONSERVATION OFFICERS CREEL AND BAG CHECKS

By E. B. Speaker 32-34

ABSTRACTS OF QUARTERLY BIOLOGY REPORTS

RESULTS OF THE 1961 IOWA SHOTGUN SEASON FOR DEER

BY

Eldie W. Mustard
Game Biologist

Iowa deer hunters experienced their most successful season in 1961 with a total kill of 5,364 deer. Deer included in the harvest were taken as follows: shotgun permittees, 4,033; bow permittees, 367; tagged, farm-killed deer, 522; and untagged, farm-killed deer, 442. Shotgun permit holders had a hunter success ratio of 51.6 percent.

Shotgun permit hunters hunted 119,159 hours during the 1961 season or an average of 15.2 hours each. Collectively, bow and gun permit holders spent 223,048 hours or 26,631 8-hour days hunting deer in 1961. It required 29.5 hours of hunting for each deer the shotgun hunters reduced to possession. A total of 60,551 deer was reported sighted by the gun hunters at the rate of 0.51 per hour or a deer was sighted for each 2 hours of hunting. An age ratio of 24 fawns:100 adults was reported by the hunters; however, this ratio differed greatly from the 76 fawns:100 adults observed at check stations and locker plants. The sex ratio reported by the gun hunters of 117 males:100 females was quite similar to the 110 males:100 females observed by Commission personnel during the deer season.

IOWA QUAIL HUNTING, 1961 - 1960

BY

M. E. Stempel
Game Biologist

In the Iowa quail range in 1961, 204 average quail hunters were contacted, compared to 165 in 1960. Their success was recorded in Conservation Officer's field contact booklets. There was an improvement of about 30 per cent in hunting success. About 20 per cent of hunters also shot pheasants while hunting quail. Up to 30 per cent shot quail, rabbits, pheasants, squirrels and ducks. A more intensive check by the biologist indicated that among more experienced quail hunters the 1961 hunting success increased over 1960 by about 30 per cent.

SEX RATIOS OF PHEASANTS OBSERVED DURING THE WINTER COUNT - 1962

BY

Richard C. Nomsen
Game Biologist

II

Conservation Officers recorded 60,373 pheasants during the extremely rugged winter of 1962. The observed sex ratio of 3.1 hens per cock indicated that 64 per cent of the roosters were shot during the 1961 season. The kill in northeast and central Iowa was favorable, but results in other areas of the state continue to show a poor harvest. Although the season shooting hours have more than doubled in recent years, the percentage of cocks harvested has remained essentially the same. These results certainly indicate that the more generous regulations of the past five years have not over-harvested Iowa's pheasant population.

WINTERING OF WILD TURKEYS IN YELLOW RIVER FOREST AREA

BY

Eugene D. Klonglan
Game Biologist

Thirty-nine wild turkeys, 10 gobblers and 29 hens, were released in the Yellow River State Forest in northeastern Iowa in late 1960 and early 1961. At least seven broods with 58 young were raised in 1961. The population in the early fall of 1961 was estimated at around 100 birds. Nearly all of the turkeys wintered in the same general area southeast of the State Forest, with the largest single flock sighted being about 60 birds. Groups of 30 to 45 were seen many times. In early April, 51 were counted in two separate flocks. This represents, at minimum, a 30 per cent increase over the 39 birds originally stocked. The number of hens entering the 1962 breeding season may, however, not be greatly different from 1961 because of an equalizing trend in the sex ratio.

RESULTS OF SEMI-CONTROLLED HUNTING UPON THE HARVEST OF WATERFOWL AT LAKE ODESSA, IOWA, 1960 and 1961

BY

James G. Sieh and William Aspelmeier

In 1960 and 1961 two "controlled" shooting areas with a total of 25 blind sites were established. The remaining "uncontrolled" portion of the public hunting area was open without special restrictions. Checking stations were established at each of the two main access points. A total of 6,014 hunters harvested 6,499 waterfowl in 33,968 hours, averaging one bird for each 5.22 hours of hunting in 1960. In 1961 a total of 3,391 hunters killed 3,391 waterfowl in 17,618 hours, averaging one bird for each 5.20 hours of hunting. Hunter success, expressed as the number of ducks per hunter per day, was 1.1 in 1960 and 1.0 in 1961; however, the aggregate harvest dropped 48 per cent in 1961. Season length was reduced 40 per cent and there was a 44 per cent drop in the number of hunters. The reduction in daily bag from 3 to 2 ducks had little if any effect upon the total harvest, and the reduction in season length was almost entirely responsible for the 43 per cent drop in mallard kill. Mallards comprised 78 per cent of the harvest and wood ducks 7 per cent. Flight dates during the 1961 season were indicated by peak kills of mallards on October 23, November 3, 8 and 17. The sex ratio of mallards in the kill averaged 1.5 males to 1 female during both years, but increased during the major flight dates to

1.7:1, indicating a preponderance of drakes within the population, selectivity on the part of hunters, and their preference for drakes. Age ratios of mallards obtained at checking stations and from the "wing method" were almost identical (0.7:1 and 0.8:1) indicating very poor production of mallards supplying young birds for hunters at Lake Odessa in 1961.

* This paper was presented at the Iowa Academy of Science meeting at Wartburg College, April 13, 1962, and will be printed in total in Volume 69 of the Proceedings.

VERNAL BREEDING OF COTTONTAILS IN IOWA*

BY

Paul D. Kline
Game Biologist

Studies of 399 cottontails taken during late winter and spring of 1958 through 1961 have established the early portion of the breeding season for the species in Iowa. Males were found to progress in breeding condition starting in February and to reach a peak in April or in months following. Pregnant females occurred late in February. Most females became pregnant for the first time in March. All females examined after April 1 were found pregnant. Differences in commencement of the breeding season from one year to another were noted. A statistically significant difference in average size of first and second embryonic litters was noted. Litters from northern Iowa averaged larger than those from southern Iowa. This difference was statistically significant at the 0.20 level of confidence.

* Same as James G. Sieh

FURTHER NOTES ON THE EFFECTS OF MECHANICAL REDUCTION ON THE GROWTH OF CRAPPIES IN BACKBONE LAKE, IOWA

BY

Roger Schoumacher
Fisheries Biologist

In 1956 and 1957, nearly 30,000 black and white crappies were removed from 125-acre Backbone Lake with trap nets. An increase in the annual growth rate, average length, and average condition factor was evident following reduction. The 5-year growth index - a summation of the average growth increments during any given year for the first five age classes - increased in the white crappie each year following reduction. Year class strength indicates that increased growth was due to mechanical reduction, and other data suggest that the growth rate is, or soon will be, at pre-reduction levels. Indications are that the fishermen caught fewer, but larger, crappies.

IV

THE 1960 AND 1961 CREEL CENSUS ON TEN STREAMS AND FOUR LAKES IN WESTERN IOWA

BY

Bill Welker
Fisheries Biologist

Creel census data were accumulated by Conservation Officers on ten rivers and three lakes in western Iowa during 1960 and 1961. The number of fishermen contacted was limited at several of the areas. Bullheads, catfish and carp were the fish most frequently caught at the lakes during both years. River anglers caught bass, bluegill and crappie most frequently in 1960; bullheads, bluegill and crappie were most important in 1961. The number of fish caught per hour in the rivers ranged from 0.26 to 1.70 in 1960, and from 0.18 to 1.36 during 1961. The same value for lake anglers ranged from 0.70 to 1.60 and from 1.76 to 2.10 during the same two years, respectively.

PLEASURE BOAT NUMBERS AS COMPARED TO FISHING BOATS ON THREE NATURAL LAKES, SUMMER, 1961

BY

Tom Moen
Fisheries Biologist

Pleasure boats were counted in conjunction with routine creel census boat counts on three natural lakes during the summer of 1961. The results were calculated and summarized for June, July and August as the average number of boats and boating hours for the average weekday and average week-end day each month and the monthly totals.

Both types of boating showed pronounced increases on week-ends, but only small increases were noted for fishing boats during July and August on East Okoboji and West Okoboji. Both of these lakes ranked high in the number of pleasure boats and the number of pleasure boat hours. Fishing boats were three times more abundant than pleasure boats on Spirit Lake and they spent nearly six times more hours on the lake.

CREEL CENSUS OF DES MOINES RIVER FISHERMEN IN BOONE, DALLAS, AND POLK COUNTIES, IOWA

BY

Harry M. Harrison
Fisheries Biologist

Creel censuses were conducted on the Des Moines River during the open water seasons, usually April through November, from 1953 through 1961. The data indicated a relatively constant catch of fish. The rate of annual catch varied between a minimum of 0.26 and a maximum of 0.61 fish per fisherman-hour. The data were also analyzed by "proficiency categories" involving (1) all fishermen, (2) fishermen with one fish, (3) fishermen with two fish, and (4) fishermen with three or more fish. The most proficient fishermen (those with three or more fish at the time of interview) constituted 13 percent of all anglers, and caught 65 percent of all fish.

The average length of the angler day for the census period was 2.3 hours. Channel catfish, carp, bullheads, and walleye pike, in that order, were the important fish taken. Fishermen aptitude or skill is concluded to be the significant factor related to both the catch of fish and the rate at which they are caught.

* Same as James G. Sieh

THE CONTROL OF NUISANCE AQUATIC VEGETATION
WITH BLACK POLYETHYLENE PLASTIC

BY

J. K. Mayhew and Sylvan T. Runkel

Large sheets of black polyethylene plastic was used to control nuisance aquatic vegetation in small farm ponds and lakes. The plastic was floated over vegetation beds and left unattended for a predetermined number of days. Seven individual experiments were conducted over two summers.

Adequate control of all species of Potomageton was achieved after continuous covering of 10 to 18 days. Ceratophyllum demersum was eliminated in the control plots in 18 to 28 days. This method of control was unsuccessful for Chara vulgaris and Sagittarius latifolia. All control plots were revegetated with filamentous algae within 30 days after the covering was removed.

The size of the control plots must be kept small because of the heavy weight of the plastic sheet. It is also quite bulky and difficult to handle in strong winds. The covering must also be protected from winds by weighting the corners and edges.

* Same as James G. Sieh

CONSERVATION OFFICERS CREEL AND BAG CHECKS

BY

E. B. Speaker
Supt. of Biology Section

(No Abstract)

RESULTS OF THE 1961 IOWA SHOTGUN SEASON FOR DEER

BY

Eldie W. Mustard
Game Biologist

INTRODUCTION

Special permits were issued to 8,000 hunters for the ninth Iowa shotgun deer season, with the 3-day statewide season held on December 16, 17, and 18. Landowners, tenants, and their children were allowed to hunt on their property without a permit.

Data used in this report are from three sources: hunter card reports; Conservation Officer estimates of untagged, farm-killed deer; and Conservation Officer tagged, farm-killed deer reports.

Hunter report cards were received from 7,901, or 98.8 percent of the 8,000 permit holders. It was assumed that the 99 hunters who failed to return their cards did participate in the recent season. Of those returning cards, 179 said they did not hunt during the open season.

RESULTS

Deer Kill and Hunter Success

Iowa deer hunters had the most successful season on record in 1961 with a total deer harvest of 5,364, which is well above the 1953-1960 average of 3,180 (Table 1). Deer included in the 1961 harvest were taken as follows: shotgun permittees, 4,033; bow permittees, 367; tagged, farm-killed deer, 522; and untagged, farm-killed deer, 442. A summary of the kill, by county, is given in Table 2.

Gun hunters had a hunter success ratio of 51.6 percent in 1961, compared to the average success ratio for the preceding deer seasons of 45.2 percent (Table 1). In only two seasons, 1953 and 1954, did hunters have a greater hunter success ratio than they realized in 1961.

Deer Hit But Not Retrieved

Hunters were asked to indicate whether or not they had wounded and failed to recover any deer. Five hundred and ninety-nine gun hunters, or 7.6 percent of the hunters, said they had wounded but not recovered at least one deer. In 1960, 9.8 percent said they wounded one deer or more which they had failed to recover.

The slight decrease in the percent of hunters wounding deer may be attributable to the snow cover which was present over much of the state during the 1961 season. This undoubtedly allowed hunters to track down and retrieve many wounded deer which would otherwise have been lost.

Sex and Age Ratios

A sex ratio of 117 males:100 females was reported for the deer harvested by gun hunters. This is only a slight departure from the ratio of 110 males:100 females observed in the sample of deer checked during the deer season by Commission personnel.

The gun hunters indicated they harvested 774 fawns and 3,220 adults for an age ratio of 24 fawns:100 adults. This is a great departure from the age ratio of 76 fawns:100 adults found in deer sampled at check stations and locker plants by Commission personnel during the deer season.

Obviously, our Iowa deer hunters either cannot or will not differentiate between fawns and adults.

Hours Hunted Per Deer Harvested and Deer Observed Per Hour

Shotgun hunters hunted 119,159 hours during the 1961 season for an average of 15.2 hours per hunter. Collectively, gun and bow permit hunters spent 223,048 hours hunting deer in 1961. The Iowa deer herd furnished in excess of 26,631 8-hour days of outdoor recreation last year.

An average of 29.5 hours of hunting was required for each deer reduced to possession. This is only slightly less than the mean of 31.0 hours required to bag a deer in our previous eight seasons, but is considerably less than the 37.2 and 37.9 hours the hunters spent in 1959 and 1960 for each deer (Table 1).

A total of 60,551 deer was sighted by the gun hunters at the rate of 0.51 deer per hour of hunting, or about one deer for each 2 hours of hunting. This is only a slight increase over the 0.45 deer sighted per hour in the 1960 season.

Day Killed and Time of Day

The day deer were killed was indicated on the hunter report cards for 4,010 of the 4,033 deer harvested by the gun hunters in 1961. The data indicate that 34.5 percent (1,380) of the kill occurred on the first day, 37.5 percent (1,510) on the second day, and 28.0 percent (1,120) on the third day. Although hunting conditions during the 1960 and 1961 seasons were quite different, the percentages of the kill which occurred on the first, second, and third day of each season were almost identical. In 1960 the hunters reported 36.5, 35.1, and 28.4 percent of the total kill respectively for the first, second and third day of the season.

It is my belief that some hunters are purposefully biasing the day-of-kill data by falsely reporting it. There is only one overt reason why a hunter should falsely report the day he killed his deer and I believe this is directly related to fear of being charged for continuing to hunt after he has bagged his deer.

In brief, most of our deer hunting is a group or a party effort where once a hunter gets his deer he is still obliged by group opinion and pressure to continue hunting until the remainder of the party fills. For a hunter to bag his deer and then quit the hunt, while it is the legal thing to do, would, at any rate, cause the individual to be ostracized.

It is quite unnatural and places the generally law abiding hunter in an untenable position if we expect him to quit after he has shot his deer and essentially desert the remainder of his party. Most hunters would probably lie before they would face the scorn of their peers and this is precisely what I believe many are doing when it comes to reporting the day on which they killed their deer. It would do us well to scrutinize closely the regulations governing this area of deer hunting in Iowa.

As in past years, the kill was about equally divided between the morning and the afternoon periods, with about 50.9 percent of the deer taken in the morning and 49.1 percent in the afternoon.

Hunter Mobility

The average hunter hunted in 1.18 counties in 1961 compared to 1.24 in 1960 and 1.14 in 1959. Apparently the longer seasons in 1960 and 1961 have not greatly altered the mobility of the average hunter.

Table 1. COMPARISON OF IOWA SHOTGUN SEASONS FOR DEER 1953 - 1961

Year	Number Permits	Shotgun Permit Kill	Total 2/ Kill	Shotgun Hunter Success	Hours Hunted Per Deer Bagged	Season Length
1953 ^{1/}	3772	2401	4008	61.1%	21.5	5 days
1954 ^{1/}	3788	2411	2992	63.7	--	3
1955	5586	2438	3062	43.6	28.9	3
1956	5440	2000	2678	39.2	30.4	2
1957	5942	2187	2805	36.8	31.1	2
1958	6000	2141	2891	38.4	30.2	2
1959	6000	1935	2731	33.1	37.2	2
1960	7000	3188	4269	45.9	37.9	3
1961	8000	4033	5364	51.6	29.5	3
9-year Totals	51,528	22,734	30,800	--	--	-
(1953-1961)						
8-year \bar{x}	--	2337	3180	45.2	31.0	-
(1953-1960)						

^{1/} All Counties not open for deer hunting: 45 Counties in 1953 and 51.5 Counties in 1954.

^{2/} Includes kill of gun and bow permit holders and kill of non-permit hunters (landowners, tenants, and their children).

Table 2. PERMIT AND NON-PERMIT DEER KILL, BY COUNTY, IOWA, 1961

County	Permit		Non-Permit		Total
	Gun	Bow	Tagged	Untagged	
1. Adair	19	1	2	0	22
2. Adams	30	2	2	1	35
3. Allamakee	176	1	22	10	209
4. Appanoose	17	1	1	4	23
5. Audubon	10	0	5	0	15
6. Benton	54	4	3	0	61
7. Black Hawk	36	12	1	4	53
8. Boone	11	4	5	2	22
9. Bremer	34	3	6	10	53
10. Buchanan	24	2	0	5	31
11. Buena Vista	44	2	0	5	51
12. Butler	41	7	4	0	52
13. Calhoun	0	0	0	0	0
14. Carroll	5	0	0	3	8
15. Cass	22	6	10	0	38
16. Cedar	28	0	0	3	31
17. Cerro Gordo	11	1	3	0	15
18. Cherokee	59	3	15	7	84
19. Chickasaw	31	4	3	8	46
20. Clarke	34	0	3	6	43
21. Clay	72	7	6	1	86
22. Clayton	205	13	7	25	250
23. Clinton	47	8	5	3	63
24. Crawford	63	2	24	3	92
25. Dallas	34	5	4	0	43
26. Davis	6	0	1	3	10
27. Decatur	48	2	9	13	72
28. Delaware	69	11	3	6	89
29. Des Moines	58	7	2	0	67
30. Dickinson	29	3	3	0	35
31. Dubuque	31	4	0	0	35
32. Emmet	36	7	9	3	55
33. Fayette	106	3	5	3	117
34. Floyd	49	8	7	5	69
35. Franklin	11	1	0	0	12
36. Fremont	10	1	5	0	16
37. Greene	33	0	10	2	45
38. Grundy	0	0	0	0	0
39. Guthrie	81	4	8	8	101
40. Hamilton	35	1	4	1	41
41. Hancock	11	0	2	0	13
42. Hardin	69	5	10	1	85
43. Harrison	61	5	17	1	84
44. Henry	22	0	1	0	23
45. Howard	30	1	1	10	42
46. Humboldt	23	2	2	0	27
47. Ida	11	0	0	0	11
48. Iowa	41	4	1	2	48
49. Jackson	128	4	10	80	222
50. Jasper	32	1	10	0	43

Table 2. PERMIT AND NON-PERMIT DEER KILL, BY COUNTY, IOWA, 1961 (continued)

County	Permit		Non-Permit		Total
	Gun	Bow	Tagged	Untagged	
51. Jefferson	7	0	3	7	17
52. Johnson	27	2	3	2	34
53. Jones	46	3	3	8	60
54. Keokuk	43	0	6	6	55
55. Kossuth	22	4	0	0	26
56. Lee	34	1	4	1	40
57. Linn	59	5	1	3	68
58. Louisa	13	1	2	0	16
59. Lucas	78	7	11	4	100
60. Lyon	77	17	3	3	100
61. Madison	52	5	7	0	64
62. Mahaska	30	1	3	4	38
63. Marion	44	4	2	10	60
64. Marshall	16	1	3	4	24
65. Mills	25	3	15	0	43
66. Mitchell	40	12	5	6	63
67. Monona	92	14	29	4	139
68. Monroe	75	4	2	12	93
69. Montgomery	23	4	1	0	28
70. Muscatine	23	0	2	1	26
71. O'Brien	31	1	9	1	42
72. Osceola	7	1	1	2	11
73. Page	21	1	1	1	24
74. Palo Alto	32	1	5	6	44
75. Plymouth	42	4	8	3	57
76. Pocahontas	4	0	1	0	5
77. Polk	5	7	1	3	16
78. Pottawattamie	133	32	15	35	215
79. Poweshiek	10	3	1	0	14
80. Ringgold	20	0	9	0	29
81. Sac	15	6	8	0	29
82. Scott	9	2	3	0	14
83. Shelby	61	5	2	1	69
84. Sioux	34	11	19	3	67
85. Story	6	0	2	0	8
86. Tama	38	1	0	0	39
87. Taylor	16	0	4	0	20
88. Union	39	0	9	0	48
89. Van Buren	20	1	4	4	29
90. Wapello	34	1	4	0	39
91. Warren	48	7	6	7	68
92. Washington	56	2	3	14	75
93. Wayne	1	0	1	2	4
94. Webster	31	1	3	3	38
95. Winnebago	27	4	3	2	36
96. Winneshiek	184	2	16	28	230
97. Woodbury	94	16	17	13	140
98. Worth	25	6	7	1	39
99. Wright	26	2	4	0	32
Unknown	1	0	0	0	1
Totals	4033	367	522	442	5364

IOWA QUAIL HUNTING, 1961 - 1960

BY

M. E. Stempel
Game Biologist

The 1961 Iowa quail hunting season was November 4 through December 15 in 59 counties in the southern portions of the state and in counties along the Mississippi and Missouri Rivers. In 1960 the dates were November 5 through December 4. Both years the shooting hours were 9:00 a.m. to 4:30 p.m.. Daily bag limit was 5 with possession limit of 10. Data from these hunting seasons are contained in this report.

METHOD

The general statewide quail hunting information is collected in the field by Conservation Officers. The 1961-1960 data were recorded in 6 x 3" field contact record booklets. On each page of these are spaces for designating the area, license number, name of hunter, address, species taken, hours, additional notes and the name of the Officer. Data on other species of game and on fish were also entered in the booklets. In February the Officers were asked to mail to Des Moines all booklets containing hunting and fishing data. Early in March the biologists met at the Research Station near Boone and there the 1961 data were compiled. Most of the 1960 quail data were already checked. In addition to the information in the booklets, I collected more detailed information on quail shooting. This was done by use of quail contact cards which were in use several years previous to 1960 when Officers began using the booklets.

RESULTS: FIELD CONTACT RECORD INFORMATION

Most of the information was collected in the following counties: Appanoose, Clarke, Davis, Decatur, Des Moines, Jefferson, Keokuk, Lucas, Madison, Montgomery, Ringgold, Warren, and Wayne. This material along with data from the balance of the quail range is presented below.

Table 1. Quail Hunting Results from Field Contact Record Booklets.

	<u>1961</u>	<u>1960</u>
No. of Hunters	204	165
Man Hrs.	841	549
Quail	383	205
Man Hrs. per Quail	2.2	2.7
Average No. Hrs. per Man	4.1	3.3

There was a 30 per cent increase in the reported 1961 quail hunting success over that for 1960. This is in line with the indicated 1961 increase in the quail over 1960.

Another feature which could now be measured was the mixed bag taken by southern Iowa hunters who indicated they were hunting quail. A sample by the biologist (Quarterly Biology Reports, April 1959) indicated that a mixed bag was important to hunters.

Data from the 1961 and 1960 seasons confirmed that throughout the quail range, in addition to quail, the hunters who were contacted took pheasants, rabbits, squirrels and mallard ducks.

In 1961, thirty per cent of the total number contacted in the entire quail range had pheasants, quail and other game, (all counties open for quail shooting did not have open pheasant season). In the portion of the pheasant range which was open to both quail and pheasant shooting, 19 per cent had pheasants and quail. In 1960, the take in addition to quail, over all the quail range was 31 pheasants, 9 rabbits, 4 squirrels and 2 mallard ducks. Twenty-six per cent of hunters who sought quail had quail and some additional game. In counties open for pheasant shooting, as well as quail shooting, 21 per cent had pheasants and quail.

There was a group of hunters which was not included in Table 1 because data were incomplete; ie, hours, game species, or place was omitted from the field report. This was composed of an estimated 20 to 25 men each year and they took the following species:

	<u>1961</u>	<u>1960</u>
Pheasants	8	4
Rabbits	2	6
Quail	45	23
Squirrels	3	3
Mallard Ducks	2	

Records are not available for all counties within each district of the quail range. Available data for these important areas are presented herewith:

Table 2. Quail Hunting in the Southeast and the South-central

<u>Year</u>	<u>District</u>	<u>Hunters</u>	<u>Man Hrs.</u>	<u>Quail</u>	<u>Hr. per Bird</u>
1961	SE	66	219	92	2.4
	SC	75	262	123	2.1
1960	SE	60	189	94	2.0
	SC	68	252	95	2.6

There was an increase in success in south-central Iowa, however success dropped somewhat in the southeast according to the reports in the booklets. Each year a considerable amount of the information was from different portions of the range and this may account for some of the variation. This possibility is indicated in the data discussed in the following section.

Quail Contact Cards

The quail contact cards were discontinued in 1960 in favor of a booklet in which all species could be recorded. I continued the use of some of the cards so that in the future we would have comparable records during the changeover period from card to booklet (1961-1960). With assistance from game personnel and volunteer Conservation Officers, information was collected from these counties: Appanoose, Davis, Jasper, Lucas, Marion, Monroe, Poweshiek, Wapello, Washington, and Wayne. Data from the cards are in Table 3.

Table 3. Hunting Information from Quail Contact Cards

	1961	1960
No. of Hunters	114	114
No. of Quail	286	214
Average Hunters per Party	2.1	1.5
Man Hrs.	305	272
Man Hrs. per Quail	1.1	1.6
Party Hrs. per Covey	1.5	2.7

Most hunters were local (lived within 25 miles of hunting site). Most used dogs. Some parties were asked for their opinion of the 1961 season as compared to the previous season, with these results: 1961 compared to 1960; 60 per cent thought the season was the same, 40 per cent thought it was better. In comparing 1960 to 1959; 18 per cent thought it was the same, 23 per cent thought it was better and 59 per cent thought it was poorer.

These data are furnished by men of long quail shooting experience and indicate better hunting success than that of the average shooter whose success is recorded in the booklets. Both methods (booklet and card) indicate about a 30 per cent increase in 1961 hunting success over that for 1960.

SEX RATIOS OF PHEASANTS OBSERVED DURING WINTER COUNT - 1962

BY

Richard C. Nomsen
Game Biologist

The annual winter pheasant count was conducted by Conservation Officers and Biologists during January and February to determine the sex ratio of Iowa's post-season pheasant population. The results were used to calculate the percentage of cocks harvested in 1961. Sex ratio figures are also needed to complete the 1962 spring population survey.

Forms and instructions were mailed to all Officers in time to begin the count January 1, 1962. They were instructed to count birds only during the presence of a complete snow cover.

The winter of 1962 was cold, snowy and windy. Severe weather conditions began in December as heavy snow and below normal temperatures covered the state. Many areas experienced record snowfalls in December. January was extremely cold with more snow in the southeast third of Iowa. Heavy snowfall, cold temperatures and strong winds continued through February and into late March.

Conservation Officers reported a total of 40,373 pheasants during the census (Table 1). The observed sex ratio was 3.1 hens per cock which was more favorable than the 2.8 hens per cock reported in 1961. Only 23,091 birds were checked during the mild winter a year ago. Observations were somewhat restricted in some areas of eastern and southern Iowa because of unpicked corn fields. These fields offered excellent cover and food during the severe winter months.

The post-hunting season sex ratio of 3.1 hens per cock indicated that 64 percent of the cocks were shot last fall compared with 58 percent during the 1960 season. Hunters harvested 61 percent of the roosters in 1959 and 64 percent were taken in 1958. Large fields of unpicked corn favored the ringneck in east central and southern Iowa. Crop harvest was nearly complete over most of the primary range.

Table 1. Observed sex ratios of pheasants reported from agricultural districts, 1962

District	Hens	Cocks	Sex ratio
1 Northwest	13,952	5,641	2.5
2 North central	9,938	2,869	3.5
3 Northeast	4,654	908	5.1
4 West central	5,658	1,949	2.9
5 Central	7,770	1,964	3.9
6 East central	850	363	2.3
Southern 3 districts	2,905	952	3.1
Total for state	45,727	14,646	3.1

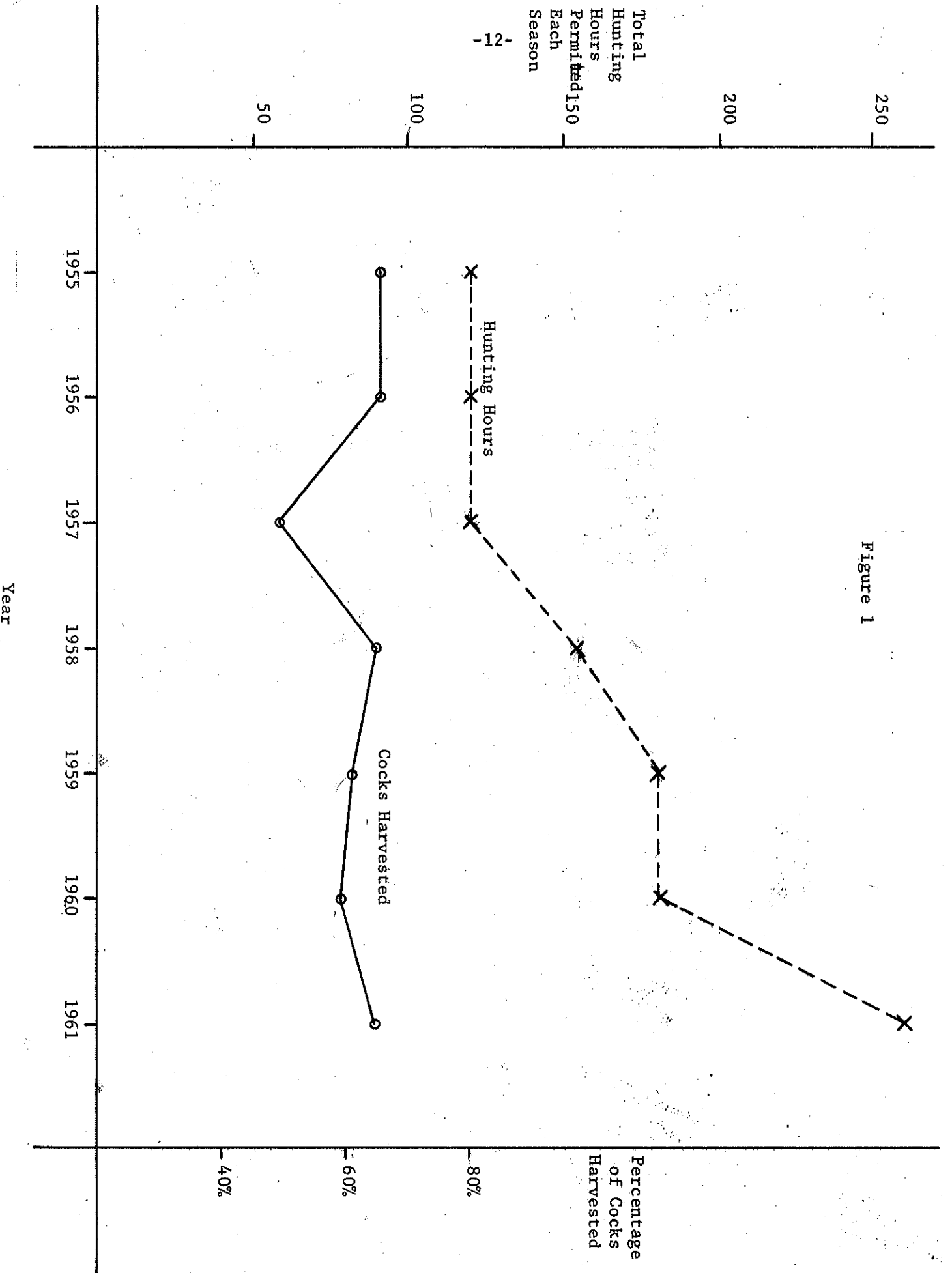
Sex ratios the past winter again showed considerable variation among the districts (Table 2). Sex ratios in east central and northwest Iowa revealed that only about 50 percent of the available roosters were harvested. Records from the north central district indicated a much better kill in 1961. Sex ratios obtained in central and northeast Iowa were higher than the state average and showed a favorable harvest of about 78 percent.

Table 2. Comparison of observed sex ratios by agricultural districts, 1959-1962

Districts	Observed sex ratios			
	1959	1960	1961	1962
1 Northwest	2.5	2.9	2.4	2.5
2 North central	3.0	2.6	2.9	3.5
3 Northeast	4.9	3.6	4.7	5.1
4 West central	3.0	3.1	2.4	2.9
5 Central	3.0	2.8	4.2	3.9
6 East central	3.3	3.3	2.0	2.3
Southern 3 districts	<u>3.6</u>	<u>3.0</u>	<u>2.6</u>	<u>3.1</u>
State average	3.1	3.0	2.8	3.1

Sex ratios obtained during annual winter counts have shown little variation and continue to show a high proportion of cocks in Iowa's post-season pheasant population (Figure 1). Hunting opportunity has been increased from 108 hours per season in 1957 to 262 hours in 1961. Although the shooting hours have more than doubled, the percentage of cocks harvested has remained essentially the same. The 1957 kill percentage was much lower than normal because of extremely difficult hunting conditions. These results certainly indicate that the more generous regulations of the past five years have not over-harvested Iowa's pheasant population.

Figure 1



WINTERING OF WILD TURKEYS IN YELLOW RIVER FOREST AREA

BY

Eugene D. Klonglan
Game Biologist

INTRODUCTION

Thirty-nine wild trapped turkeys of the Rio Grande subspecies from Texas were released in the Yellow River State Forest in Allamakee County in northeastern Iowa in late 1960 and early 1961. Twenty birds, 8 gobblers and 12 hens, were stocked on November 18, 1960; 19 birds, including 2 gobblers and 17 hens, were liberated on March 6, 1961. The sex ratio of the released turkeys was thus approximately 1:3 (10 gobblers and 29 hens). These birds experienced a very mild winter after their release, a rather fortunate circumstance considering the time of release. At least seven broods were raised in the summer of 1961, with a total of 58 chicks when last sighted. It is possible a few other broods may have been hatched but not sighted or reported. It was estimated that the minimum population present at the end of the rearing season, or in early fall, was around 100 turkeys.

WINTER POPULATION

In mid-November a flock of 30 to 40 turkeys was sighted at the edge of a corn field on the bottomlands of Big Paint Creek east of the State Forest. This was the earliest reported sighting of a large flock. During the first week in December, a flock of around 60 birds was observed by a farmer, Roy McGeough, living at the southeast edge of the Forest (Sec. 8, T96N, R3W). He actually counted 47 birds, at which point he lost count as the birds milled around, and then estimated at least 60 were present.

Also during December, four turkeys were regularly sighted on the Roy Mount farm along the Yellow River about 5 miles southwest of the original release site and the larger flock at McGeough's (Sec. 27, T96N, R4W). One brood had been reported from this general vicinity last summer. Only two birds were regularly sighted during the first 10 days of January. One of these appeared in weakened condition and was not seen again after that time. The remaining bird was last seen on January 15 heading east from the farm, apparently being "restless" now that it was alone, and was not reported thereafter.

The flock whose activities centered around the McGeough farmstead was observed regularly throughout the remainder of the winter. The number sighted each time varied considerably--from two or three birds to 30 or more. The largest group counted in January was 42 on the 15th. On February 11, 45 were seen. It was debatable, however, whether these larger flocks contained all of the turkeys actually present. The numerous sightings of smaller groups indicated that the birds did not keep together in a single unit all the time. For example, on February 13 (2 days after the 45 were counted) flocks of 20 and 11 birds were seen about a third of a mile apart.

No confirmed reports of turkeys having been sighted the past winter in areas other than the two above locations were received. There is, of course, the possibility that a few birds may have been present along the Yellow River to the south of the State Forest, or that a few individuals might have been located in isolated areas along

the heavily wooded Mississippi River bluffs east of the Forest or in other larger wooded tracts in the vicinity. It does not seem likely, however, that a flock of any size could have gone through the winter without being reported to the Commission personnel stationed in the area.

During the last week of March, following a month of severe winter weather, McGeough reported seeing a flock of about 35 birds. However, he reported that most of the time he had been seeing smaller groups. Signs pointed to the beginning of the spring "break-up"--for example, two tracks were found along the Big Paint Creek near the Jones farmstead east of the Forest Headquarters, where turkeys had not been seen since mid-November. On April 2, following the last major snowfall of the season, two flocks of turkeys with a total of 51 birds were sighted. A group of 21 birds was seen just beyond the west edge of the State Forest boundary near the "Cherry Mound" road. At about the same time, a flock of 30 was counted east of the Forest in the area near McGeough which was frequented most of the winter. Since the birds were sighted at about the same time and the distance between the two was more than 3 miles, there was no doubt they were separate flocks. Within a week thereafter, observations of single birds at seven scattered locations throughout the Forest area again pointed toward the spring break-up of the flocks.

Again, it was not certain whether the 51 birds represented total population. It seems probable that a few birds may have weathered the brief snowstorm without again attaching themselves to a main flock. However, it is a certainty that at least 51 wild turkeys survived one of the most severe winters on record. Since there were, at most, 39 birds at the beginning of the 1961 breeding season (assuming no mortality of the released birds), the turkeys were able to achieve, at minimum, a 30 percent increase in their numbers during their first full season in Iowa. However, it must be remembered that the original sex ratio was nearly 1:3, with a total of 29 hens. The sex ratio of the birds entering the 1962 breeding season is probably more equal. A ratio of 1:1.3 would mean that the same number of hens - 29 - was present. Unfortunately no information is available on the actual ratio.

FEEDING ACTIVITIES

Three food patches of grain sorghum were planted on the State Forest--one near the southeast entrance, one near the central area where the birds were originally released, and one along Little Paint Creek on the northeast side of the area. However, there was not a single known instance of turkeys utilizing, or for that matter even finding, any of these patches. A 2-acre patch of corn on land purchased from John Jones, which was even closer to the turkeys' wintering grounds, was not used by them, though heavily utilized by deer. Three elevated feeders furnished with corn and grain sorghum were provided for the birds in the timber southeast of the McGeough farmstead. The birds showed little inclination to use these until the period of severe snow conditions occurring in late February and early March. They made considerable use of the feeders during this time. Another feeder has been in place at the site of the original stocking. Three turkeys were seen at this feeder in late December. Very little turkey sign was seen on the State Forest proper at any time during the winter, most activity being on the area just to the east of the state lands.

Instead of utilizing the food patches and feeders, the turkeys fed primarily on what they could pick up from manure and hay bales scattered by McGeough and neighboring farmers on their fields. Hay bales were broken open as feed for dairy cattle, and this was done in somewhat random fashion over the fields, particularly those that will be planted to corn the next year. Manure from the barn and lots was scattered almost daily over the fields, and considerable potential turkey food was present in this--primarily in the form of corn kernels which pass nearly intact through the digestive system of the cattle. Most farms in this area have considerable livestock, particularly dairy cattle, and a great deal of manure is spread over a considerable

acreage. The practice of feeding baled hay in the field is also widespread. Such areas will be within easy range of wild turkeys anywhere in this part of the state.

It does not seem likely that the turkeys will restrict their range solely to forest areas during periods when they would be forced to scratch through deep snow to obtain food, when easily accessible food is being supplied in the above fashion on top of the snow by nearby farmers. It seems improbable that enough food patches and feeders could be provided to keep the birds from being attracted to such areas. During short periods this past winter when snow was too deep for farmers to haul manure or feed cattle in the field, the turkeys moved into feedlots near the buildings to feed. Farmers in the area were discouraged from attempting to intentionally feed or attract the birds around the buildings in such a manner as to cause them to remain about the premises, and thus perhaps to eventually become tame and dependent on such care. The birds this winter could not be approached very closely, even when they came into the feedlots to feed. We can hope there will be a parallel with the situation true of pheasants, which often come into the farmsteads to feed in severe winters but still manage to remain quite wild. If this would hold true, we might find the wild turkey to be compatible with conditions in a predominantly agricultural state like Iowa wherever there is sufficient timber.

MORTALITY

A dead juvenile hen was found in early March in the area where the three feeders were located. There were reportedly no fox or other mammalian tracks around it--only what appeared to be crow tracks. Those who found it thought perhaps a great horned owl was responsible. Examination of the bird by Dr. Haugen at the Wildlife Research Unit indicated the bird apparently died a violent death, for there were signs of hemorrhage on the inside of the skin in the neck region and a gash in the breast muscle. The crop was full of food consisting of about 75 percent corn, 15 percent grain sorghum (the feeders were filled with corn and milo) and the balance of miscellaneous items, including part of a burdock with a live juicy-looking worm. It was not certain what actually killed the bird or if the bird was ailing at the time of death. An interesting sidelight was that one approximately #6 shot was found inside the skin on one leg, obviously from an earlier encounter since there was no fresh wound near the pellet.

FURTHER NOTES ON THE EFFECTS OF MECHANICAL
REDUCTION ON THE GROWTH OF CRAPPIES IN BACKBONE LAKE, IOWA

BY

Roger Schoumacher
Fisheries Biologist

In 1954, Backbone Lake, a 125-acre Maquoketa River impoundment in Backbone State Park, Delaware County, Iowa, contained a large population of small crappies. Although a cursory age and growth study revealed that the fish were growing "normally" for this latitude, it was decided to remove a portion of the population and to analyze any change in growth of individual fish following this reduction.

The first removal took place in May, 1956 with subsequent removals in May and October of 1957. This work, and the results through October, 1957, were reported on in a previous Seminar by Cleary and Moen (1957). A summary of their findings, as it applies to this paper, is appropriate at this time:

1. Fish were removed with trap nets in the following amounts:

Date	Crappie		Other fish (carp and suckers) lbs./acre removed
	Approx, no. removed	lbs./acre removed	
May, 1956	10,500	13	4
May, 1957	11,000	17	6
Oct., 1957	7,000	9	9
Totals	28,500	39	19

2. Scale analysis revealed that both species of crappie increased in growth after removal of a portion of the population. This was especially apparent in the younger age classes.
3. One year after the initial removal the growth increment of white crappies increased an average of 70 per cent. Eighteen months after the first removal the average growth increment was still larger than before population reduction, but not as spectacular as the 12-month sample.
4. The average "K" factors were:

Date	Average "K"	
	Black crappie	White crappie
May, 1956	3.05	3.13
May, 1957	4.84	4.41

The purpose of this paper is to report the results of scale analysis of crappies taken by trap nets from Backbone Lake in the springs of 1959, 1960, and 1961. Approximately 50 white and 50 black crappies were aged from each of the three collections.

Tables 1 and 2 give a breakdown of the average total length in inches of black and white crappies at each annulus. It is evident from an examination of these tables that in almost every case the growth following each reduction tended to increase.

Tables 3 and 4 show the average increment during the years 1952-1960, for each age class of fish. It is again evident that the growth increment increased in all age classes following population reduction.

Perhaps one of the best methods of assessing the effects of numerical reduction on this crappie population is to add together the growth increments of various age classes during a given year. I will use what I call the 5-year growth index, and will define it as the sum of the average growth increments during any given year for each of the first five age classes in that year. Examples of this are given in Tables 3 and 4. The growth index shows the average growth which could be expected from a fish if the conditions affecting growth remained constant in a body of water for a given number of years - 5 years in my example. As can be seen in Table 3, the 5-year growth index for white crappies, before any mechanical reduction in the population, was 8.6 inches. In 1956, following the first reduction, it increased to 8.9 inches, and following the second reduction in May of 1957 it increased further to 9.7 inches. The third reduction, in October of 1957, came at the end of the 1957 growing season, so its effects would not be expected until 1958. The 1958 5-year growth index was 11.4 inches, a 30 per cent increase over the 1955 figure of 8.6 inches. The comparison cannot be continued through 1959 and 1960, because of a lack of data on growth in age classes I and II during those years. However, the data that is available for the other age classes indicates that by the end of the 1961 or 1962 growing season it will be at, or very close to, pre-reduction levels.

The condition factors (Table 5) increased considerably each year following the initial population reduction, at least through 1959. During the 1960 growing season they began to decrease. This rise and fall is very similar to the rise and expected fall in the length increases in the fish, especially as expressed by the 5-year growth index.

Whereas reliable data as to year class strength is not possible with the small amount of data on hand, Tables 6 and 7 indicate that for the period 1954-1958, the 1955 and 1956 year classes were the strongest, with a subdominant year class in 1958. The 1957 year class was unimportant. The 1954 year class was weak for white crappies, but conclusive data is not available for the black crappies, which were represented by a single 5-year old fish in 1959, but by 28 fish in the 1960 collection as 6-year olds. This age class disappeared in the 1961 collections. Cleary and Moen (op. cit.) also suggested strong year classes in both 1955 and 1956. This data would indicate that the increase in growth of the fish was due to mechanical reduction in the population, and not to poor year classes of fish, with resulting low populations and increased growth rates due to natural factors.

Since an increase in the number and/or size of the fish on the angler's stringer is the most important aim of fish management, the average size of the fish taken from 1956 to 1961 is important. It is assumed that an increase in the average size of fish taken in the trap nets indicates a corresponding increase in the average size of fish taken by the angler, although data to support this contention is not

available. Table 8 shows that during 1956 and 1957, the average size remained about the same - approximately 7.5 inches. It increased in 1959 and 1960 for both species, and in 1960 the average size of black crappies taken was 9.3 inches, an increase of 2 inches over the 1957 average. White crappies averaged 8.9 inches, 1.5 inches longer than in 1957. In May of 1961 the average length of black crappies remained about the same (down 0.2 inches), whereas the average white crappie was 1.0 inch longer than during the previous year.

It appears, therefore, that the mechanical reduction did increase the growth and average size of both black and white crappies, and that population reduction is a useful tool in the management of the lake. A creel census to determine any changes in the fishing success would be a valuable and interesting study to run in conjunction with the population reduction. The only creel census information available is that which was collected by the Conservation Officer during the 1960 and 1961 fishing seasons, which shows a crappie/hour catch of 0.42 and 0.47 in 1960 and 1961 respectively. Personal observations by the Officer indicated that the people were catching larger, but fewer, crappies after the population reduction.

Population reduction could probably be done quicker, easier, and at less expense by partial treatment of the lake with rotenone, so long as the purpose is population reduction, and the fish that are removed are not wanted for restocking in other areas.

SUMMARY

1. In an attempt to increase the growth of crappies in Backbone Lake, Iowa, nearly 30,000 of these fish were removed with trap nets in 1956 and 1957.
2. Scale analysis of approximately 300 crappies revealed that, in almost every case, growth following reduction increased.
3. The 5-year growth index - a summation of the growth increments during a given year of the first five age classes in that year - increased following reduction, and now shows signs of decreasing to pre-reclamation levels. Condition factors followed a similar pattern.
4. The data indicate that the 1955, 1956, and 1958 year classes were strongest, with lower year class strength in 1954 and 1957, and tended to show that the increased growth of the fish was due to the mechanical population reduction, rather than to poor year class strength.
5. The average size of fish increased following reduction. There are indications that the fishermen caught fewer, but larger, crappies.
6. Population reduction is a useful tool in managing Backbone Lake, but chemical, rather than mechanical, reduction might be advisable from an economic standpoint.

LITERATURE CITED

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- 1957 The Effect of Mechanical Reduction on the Growth of the Crappie in Backbone Lake. Qutly. Biol. Repts., Iowa Conservation Commission (9)4:13-19(mimeo).

Table 1. Age and growth of white crappies in Backbone Lake, Iowa.*

<u>1959 Collection</u>										
Year Class	No. of fish	Total length at each annulus								
		I	II	III	IV	V	VI	VII	VIII	IX
1957	1	4.2	6.7							
1956	21	3.3	6.0	8.1						
1955	17	3.3	5.8	7.4	8.8					
1954	3	3.2	5.7	6.8	7.4	9.1				
	42	3.3	5.9	7.7	8.6	9.1				
<u>1960 Collection</u>										
Year Class	No. of fish	Total length at each annulus								
		I	II	III	IV	V	VI	VII	VIII	IX
1957	9	4.1	6.4	8.4						
1956	21	3.1	5.7	7.6	9.1					
1955	11	3.1	5.6	7.0	8.3	9.5				
1954	3	2.8	5.0	6.4	7.6	8.7	9.8			
	45	3.2	5.6	7.4	8.5	9.3	9.8			
<u>1961 Collection</u>										
Year Class	No. of fish	Total length at each annulus								
		I	II	III	IV	V	VI	VII	VIII	IX
1958	15	4.3	6.4	8.0						
1957	10	3.1	5.5	7.5	9.1					
1956	8	3.1	5.1	7.1	8.6	10.3				
1955	15	3.5	5.7	7.3	8.8	9.9	11.2			
1954	2	2.6	4.8	6.6	8.0	9.4	10.6	12.0		
1953	1	4.0	6.5	7.2	8.2	9.3	10.0	10.8	11.9	
1952	2	2.5	5.0	6.3	7.9	8.7	9.8	10.9	11.8	12.3
	53	3.5	5.7	7.4	8.7	9.9	10.9	11.3	11.9	12.3

* The left, lowest "step" line represents the first reduction in May 1956. Everything above and to the right of it represents growth following this reduction. The other lines represent the following two reductions.

Table 2. Age and growth of black crappies in Backbone Lake, Iowa. *

		<u>1959 Collection</u>						
Year Class	No. of fish	Total length at each annulus						
		I	II	III	IV	V	VI	VII
1957	2	4.9	6.5					
1956	30	3.6	5.9	7.8				
1955	11	3.4	5.6	7.1	8.5			
1954	1	4.5	6.6	7.8	8.6	10.0		
	44	3.6	5.9	7.6	8.5	10.0		
		<u>1960 Collection</u>						
Year Class	No. of fish	Total length at each annulus						
		I	II	III	IV	V	VI	VII
1956	12	3.8	5.5	7.0	8.4			
1955	12	3.8	5.5	6.7	7.9	9.0		
1954	28	3.2	5.0	6.3	7.5	8.7	9.7	
1953	1	1.8	3.2	4.4	5.2	6.2	8.0	9.5
	53	3.5	5.2	6.5	7.8	8.7	9.7	9.5
		<u>1961 Collection</u>						
Year Class	No. of fish	Total length at each annulus						
		I	II	III	IV	V	VI	VII
1958	20	3.9	6.1	7.8				
1957	4	4.4	5.9	7.2	8.8			
1956	18	4.8	6.1	7.5	8.7	9.9		
1955	7	4.8	6.2	7.5	8.7	9.8	11.0	
	49	4.4	6.1	7.6	8.7	9.9	11.0	

* The left lowest "step" line represents the first reduction in May 1956. Everything above and to the right of it represents growth following this reduction. The other lines represent the following two reductions.

Table 3. Average annual growth increments and 5-year growth potential for white crappies in Backbone Lake, Iowa, 1952 - 1960. (The number of fish in each sample is given in parenthesis below the growth increment.)

Year of life of fish	Average increment during year								
	1952	1953	1954	1955	1956	1957	1958	1959	1960
I	2.5 (2)	4.0 (1)	2.9 (8)	3.3 (43)	3.2 (50)	3.6 (20)	4.3 (15)		
II		2.5 (2)	2.5 (1)	2.3 (8)	2.5 (43)	2.5 (50)	2.3 (20)	2.1 (15)	
III			1.3 (2)	0.7 (1)	1.4 (8)	1.5 (43)	2.0 (50)	2.0 (19)	1.6 (15)
IV				1.6 (2)	1.0 (1)	1.0 (8)	1.4 (43)	1.3 (29)	1.2 (10)
V				0.7* (3)	0.8 (2)	1.1 (1)	1.4 (8)	1.0 (26)	1.3 (8)
VI						1.1 (2)	0.7 (1)	1.1 (5)	1.5 (15)
VII							1.1 (2)	0.8 (1)	1.9 (2)
VIII								0.9 (2)	1.1 (1)
IX									0.5 (2)
5 year growth potential				8.6	8.9	9.7	11.4		

* From Cleary and Moen, 1957.

Table 4. Average annual growth increments and 50-year growth potential for black crappies in Backbone Lake, Iowa, 1953 - 1960. (The number of fish in each sample is given in parenthesis below the growth increment).

Year of life of fish	Average increment during year							
	1953	1954	1955	1956	1957	1958	1959	1960
I	1.8 (1)	3.2 (39)	3.9 (30)	4.0 (60)	4.6 (6)	3.9 (20)		
II		1.4 (1)	1.9 (39)	1.8 (30)	1.9 (60)	1.5 (6)	2.2 (20)	
III			1.2 (1)	1.3 (39)	1.3 (39)	1.7 (60)	1.1 (4)	1.7 (20)
IV				0.8 (1)	1.1 (39)	0.8 (30)	1.0 (30)	1.6 (4)
V				1.2* (11)	1.0 (1)	1.2 (39)	1.5 (19)	1.3 (18)
VI						1.8 (1)	1.0 (28)	1.7 (7)
VII							1.5 (1)	
5 year growth potential				9.1	9.9	9.1		

* From Cleary and Moen, 1957.

Table 5. Condition factors of black and white crappies from Backbone Lake, Iowa, 1956 - 1961, using total length in tenths of inches and weight in hundredths of pounds.

Date of collection	Reflects growing season of:	Condition factor	
		Black crappie	White crappie
May, 1956	1955	3.05*	3.13*
May, 1957	1956	4.84*	4.41*
May, 1959	1958	5.21	4.74
May, 1960	1959	5.79	5.03
May, 1961	1960	5.19	4.82

* From Cleary and Moen, 1957.

Table 6. Numbers of white crappies collected from each year class in various years of life, Backbone Lake, Iowa.

Year class	Age of fish when collected						
	I	II	III	IV	V	VI	VII
1954					3	3	2
1955				17	11	15	
1956			21	21	8		
1957		1	9	10			
1958			15				

Table 7. Number of black crappies collected from each year class in various years of life, Backbone Lake, Iowa.

Year class	Age of fish when collected						
	I	II	III	IV	V	VI	VII
1954					1	28	
1955				11	12	7	
1956			30	12	18		
1957		2		4			
1958			20				

Table 8. Average total length in inches of black and white crappies taken in trap nets from Backbone Lake, Iowa. 1956-1961.

Date Taken	Average total length in inches	
	Black crappies	White crappies
May, 1956	7.4	7.5
May, 1957	7.3	7.4
May, 1959	8.0	8.4
May, 1960	9.3	8.9
May, 1961	9.1	9.9

THE 1960 and 1961 CREEL CENSUS ON TEN STREAMS AND FOUR LAKES IN WESTERN IOWA

By

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The following data were compiled from 1960 and 1961 officer contact card records. The officers when contacting anglers in the field, recorded the number and species of fish, time spent fishing and type of bait used. Considerable information can be obtained from this type of census if it is conducted within the framework of a good sampling design. This is not always possible; however, since the varied duties of the officer make his daily schedule somewhat irregular. Therefore, some bias exists in these data.

Although there are more than one species of catfish, bass and crappie in the areas where these fishermen contacts were made, some of the fish within these groups were not identified to species. Numbers of those identified to species within these groups were noted in Tables 1, 2, 3 and 4.

RESULTS

Bullheads, catfish and carp were the fish most frequently caught in the ten rivers during both years (Tables 1 and 2). Walleye, sauger, bass, northern pike, bluegill and crappie were caught in fewer numbers. Although few conclusions can be made with regard to the number of each species taken, the number of walleye (90) caught in the Little Sioux River during 1961 indicates a fair population of this species in the river.

The number of fishermen contacted, varied considerably between each of the rivers during both 1960 and 1961. More contacts were made on each river during 1961 than in 1960 (Tables 1 and 2). During 1960 the number of contacts ranged from 1 on the East Nishnabotna River to 267 on the Little Sioux River. This range increased in 1961 to 32 to 580 respectively, on the same two rivers.

Since the number of fishermen contacts was small at several of the rivers, few conclusions can be made with respect to the number of fish caught per hour of fishing time. It is interesting to note however, that the Boyer River has the lowest value during both 1960 and 1961 while the Floyd River has the highest value during both years (Tables 1 and 2).

Few conclusions can be made from the lake data since only three lakes were compared and also because the number of fishermen contacts was small at some lakes during both years (Tables 3 and 4). Bass, bluegill and crappie were the fish most frequently caught in the three lakes during 1960, while bullheads, bluegill and crappie were caught more frequently in 1961.

Table 1. Creel Census Data From Ten Western Iowa Rivers - 1960

	1					2				3		4		Fisher- men	Hrs. Fished	Fish/ Hour
	Bullhead	Catfish	Carp	Walleye	Sauger	Bass	N. Pike	Bluegill	Crappie	Misc.	Fish					
Little Sioux	196	225	36	7		5	6	8	4	5	494	267	601.50	0.82		
Big Sioux	42	74	54		2					7	179	204	368.25	0.48		
Grand	67	43	8					3		4	125	108	207.75	0.60		
Rock	131	35	18			3		17		42	246	98	220.50	1.11		
Missouri	20	7	10							5	42	53	126.50	0.33		
Boyer	5	15	11							6	37	55	140.25	0.26		
Maple	8	1	2								11	9	15.0	0.73		
Floyd	50		1								51	19	30.0	1.70		
East		1									1	1	2.25	0.40		
Nishnabotna																

-27-

1. Includes 79 channel catfish. Others were not identified to species.
2. Five fish from Little Sioux River were not identified to species: three fish from Rock River were smallmouth bass.
3. Not identified to species.
4. Includes species of shad, gar, mooneye, sucker, sunfish, sturgeon and chub.

Table 2. Greel Census Data From Ten Western Iowa Rivers, 1961.

	1		2		3		4		Fish men	Fisher- Hrs.	Fish/ Hour
	Bullhead	Catfish	Carp	Walleye	Sauger	Bass	N.Pike	Bluegill	Crappie	Misc.	
Little Sioux	589	766	115	90		4	33		5	1,602	580 1,464.75 1.07
Big Sioux	263	196	209	1	1	2			21	693	577 1,211.50 0.57
Grand	33	209	8						6	256	206 629.00 0.40
Rock	179	54	48	1		4		25	55	366	210 411.00 0.89
Missouri	21	41	27		7			9	27	18	150 131 281.75 0.53
Boyer	19	18	16						6	59	125 316.25 0.18
West Nishnabotna	11	33	1							45	58 74.00 0.60
Maple	13	3	4						2	20	37 48.50 0.41
Floyd	66	1								67	35 48.50 1.36
East Nishnabotna	9	44								53	32 94.50 0.55

1. Includes 321 channel catfish. Most were not identified to species.
2. Includes 1 largemouth bass and 2 smallmouth bass from the Little Sioux River and 3 smallmouth bass from the Rock River. Others were not identified to species.
3. Not identified to species.
4. Includes species of shad, gar, mooneye, sucker, sturgeon, chub and sunfish.

Table 3. Creel Census Data From Three Western Iowa Lakes, 1960.

	1			2		3		4		Fisher-	Hrs.	Fish/		
	Bullhead	Catfish	Carp	Walleye	Sauger	Bass	N. Pike	Bluegill	Crappie	Misc.	Fish	men	Fished	Hour
Brown's		1	2			7	1	108	165		284	88	167.75	1.60
Decatur		2			2	11		14	11	3	43	33	61.00	0.70
Blue	66		5	20		100	20	328	122	3	664	309	612.25	1.08

1. Not identified to species.
2. Seven fish from Brown's Lake were largemouth bass. Others were not identified to species.
3. Not identified to species.
4. Includes sunfish and suckers.

Table 4. Creel Census Data From Three Western Iowa Lakes, 1961.

	1										2		3			4		Fisher -	Hrs.	Fish/
	Bullhead	Catfish	Carp	Walleye	Sauger	Bass	N. Pike	Bluegill	Crappie	Misc.	Fish	men	Fished	Hour						
Brown's	86		7			71	13	535	212	2	926	246	423.00	2.10						
Decatur	12				7			1	3	3	26	8	14.75	1.76						
Blue	395	1	2	12		36	11	441	55		953	158	517.00	1.84						

1. Not identified to species.
2. Not identified to species.
3. Not identified to species.
4. Includes only suckers.

PLEASURE BOAT NUMBERS AS COMPARED TO FISHING BOATS
ON THREE NATURAL LAKES, SUMMER, 1961

BY

Tom Moen
Fisheries Biologist

Almost every state is faced with ever increasing problems concerned with water-use management. Almost every outdoor newspaper, magazine or other recreational publication has carried discussions of this problem. The major area of conflict centers around the use of available water by fishermen as opposed to those engaged in various forms of pleasure boating. More than one state has come to the conclusion that among several factors contributing to a decline in fishing activity, and a consequent lag in fishing license sales, was the discouraging effects from competitive interference with fishing activities by other water users, such as water skiers and hotrod boaters. One unfortunate part of the situation is that individual water skiers and speed boaters take up a disproportionately great amount of the available space. This is a serious problem for everyone, including Iowa people interested in providing the greatest amount of recreation for the most people.

The increase in the number of boats can be substantiated by any number of broad statistics put out by various agencies, but there are relatively few actual "on the water counts" available. In many instances the intensity of the conflict between fishing and pleasure boats may depend on the type of area and actual number of boats involved. In a small way, at least, the figures on boat usage on a particular area may help delineate the problem.

Creel census clerks on natural lakes have counted fishing boats as a routine part of the census technique. In view of the problem outlined above, it seemed desirable to obtain counts of pleasure boats in operation at the same time that fishing boats were being tallied. This was completed for June, July, and August on three natural lakes in Dickinson County for the first time in 1961.

LAKES CENSUSED

The lakes covered in this census of boats for the summer of 1961 included Spirit, East Okoboji and West Okoboji. These are relatively large natural lakes that receive considerable recreational pressure during the summer months. All three are considered as average or better fishing lakes and the fisherman versus pleasure boat conflicts have been increasing in recent years, as they have on many other areas. Pleasure boating on West Okoboji has always been considered above average during the summer months. These three lakes have a total water surface area of 11,021 acres. Spirit Lake covers 5,682 acres and West Okoboji 3,939 acres. East Okoboji is a long narrow lake having a surface area of 1,400 acres. Boat traffic has access to and from East and West Okoboji Lakes. All three lakes have extensive summer cottage developments and many year-round homes.

METHOD OF PROCEDURE

As mentioned above, the creel census clerks counted pleasure boats operating on the lake at the same time the count of fishing boats was taken. Details of the creel census technique have been described in detail in previous seminar reports. Briefly, the day is divided into two 8-hour periods to cover early and late fishing. These periods are set into a prearranged schedule to allow for adequate coverage, including

weekends. Boat counts were made every 2 hours during each 8-hour period on Spirit Lake and every 4 hours on East Okoboji and West Okoboji. Contacts of the fishermen after completing their fishing trip provided an average time on the lake for fishing boats. No interviews were conducted in relation to the pleasure boats, making it necessary to assign an arbitrary $1\frac{1}{2}$ hours for pleasure boats in order to determine the number of boats. Several lake patrol officers indicated this was a reasonable assignment. The datum concerning the number of hours for the two types of boating was obtained by multiplying the average count for any one day times the number of hours in that day. This figure then becomes an estimate of the total boat hours for that day.

The results were calculated for the months of June, July, and August as the average number of boats and boat hours, both fishing and pleasure, for the average week-day, average week-end day and the totals for each month (Table 1).

RESULTS

Without previous information the 1961 counts have little meaning for comparative purposes except to compare one lake with another, or one period of time with another. As one would expect, the number of boats and the hours of boating, both pleasure and fishing, increased considerable on weekends. The increase in the number of fishing boats on weekends was not as pronounced during July and August on East Okoboji and West Okoboji as it was on Spirit Lake where the number of pleasure boats was consistently less than fishing boats. The increase shown in the pleasure boats on weekends may account for at least a good share of the poor showing of fishing boats even though fishing may have been relatively poor during those two months. The influence of pleasure boats is further shown by the fact there were more pleasure boats and more hours of pleasure boating on East Okoboji than there were on Spirit Lake which has almost four times as much water surface. Pleasure boats outnumbered the fishing boats at all times and in all periods on East Okoboji and West Okoboji while the reverse was true for Spirit Lake. Also of interest is the relative amount of space these boats occupy or hours of boating pressure by type of boat. On an acres-per-boat basis, the weekend pleasure boats were nearly as crowded on East Okoboji as they were on West Okoboji although most local residents consider that West Okoboji has the highest density of any local lake. On Spirit Lake the fishing boats were about three times more abundant than pleasure boats and they spent nearly six times as many hours on the lake.

CONSERVATION OFFICERS CREEL AND BAG CHECKS

BY

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In 1960, E. T. Rose, Chief of the Fish and Game Division, supplied the sixty Conservation Officers with field contact books and asked each Officer to check the success of anglers and hunters contacted during their routine work. It was felt this would furnish additional information in all areas of the state and especially where creel and bag checks were not taken by the Biology Section personnel. To avoid duplication of effort, special bag checks formerly taken by the Officer Section on pheasants, quail and waterfowl were discontinued since this information could be obtained from the new Field Contact Book system.

At the close of the second year (March, 1962) the Biology Staff reviewed all records and tabulated the data obtained by the Conservation Officers. These reports represent incomplete trips since contacts were made in the field while anglers and hunters were engaged in their sport.

These data have been or will be reported upon by species (in the case of game) or from geographical areas (in the case of fish) by the various members of the Biology Staff. Since these reports will appear at different times of the year in the Quarterly Biology Reports and elsewhere, it was felt a brief resume of all data would be appropriate at this time.

In the 2-year period ending February 1, 1961, 25,685 anglers and 23,116 hunters were contacted by the Officers. The reports were well distributed over the state and gave us information not previously obtained by other census methods. This is especially true of anglers since most of the creel census work of the Biology Section is confined to the major natural lakes, a few artificial lakes, the Mississippi and Missouri Rivers and a limited number of inland streams.

It also added information on several game species, including rabbits and squirrels and a limited amount on raccoon and fox, that was lacking except for relatively small samples collected from selected hunters.

Deer hunters were not tabulated from the Officers' contacts since the Biology Section obtains a complete record of all licensed Iowa deer hunters and their success.

Trappers were seldom checked by the new method. Iowa law requires that all fur buyers report on the furs bought and sold and the fur crop is tabulated from these reports by the License and Biology Sections.

Commercial fisheries are also omitted from the Officers' field contacts, and the individual catch reports are tabulated at the end of the season by fisheries biologists.

CONSERVATION OFFICER GAME FIELD CONTACTS
1960

SPECIES	HUNTERS CONTACTED	GUN HOURS	GAME BAGGED	HOURS TO BAG EACH ANIMAL
Pheasants	6,575	19,331	4,807	4.0
Cottontail	444	916.5	471	1.9
Squirrels	761	1,734.75	968	1.8
Ducks	2,230	10,123.5	2,501	4.0
Geese	447	1,647.25	293	5.6
Quail	165	549	205	2.7

CONSERVATION OFFICER GAME FIELD CONTACTS
1961

SPECIES	HUNTERS CONTACTED	GUN HOURS	GAME BAGGED	HOURS TO BAG EACH ANIMAL
Pheasants	6,499	20,406	5,303	3.8
Cottontail	994	2,481.75	1,559	1.6
Squirrels	866	2,180	1,388	1.6
Ducks	2,934	14,220	2,447	5.8
Geese	957	3,188.75	544	5.9
Quail	244	841	383	2.2

CONSERVATION OFFICER FISH FIELD CONTACTS
1960

	Natural Lakes	Artificial Lakes	Mississippi River	Missouri River Drainage	Central Iowa Streams	N. E. Iowa Streams	Trout
Anglers Contacted	1,691	2,988	1,758	785	2,114	2,381	1,082
Hours Fished	3,471	7,240	3,971	1,808	3,907	4,417	2,323
Fish Caught	6,374	5,601	5,106	1,065	2,360	3,018	1,192
Fish Per Hour	1.89	1.20	1.28	0.59	0.60	0.68	0.51

CONSERVATION OFFICER FISH FIELD CONTACTS
1961

	Natural Lakes	Artificial Lakes	Mississippi River	Missouri River Drainage	Central Iowa Streams	N. E. Iowa Streams	Trout
Anglers Contacted	1,598	3,848	2,025	2,103	2,977	2,202	1,021
Hours Fished	9,773	8,971	4,800	4,817	5,982	4,409	2,023
Fish Caught	5,209	7,658	5,390	3,780	2,889	3,361	1,489
Fish Per Hour	1.40	1.10	1.12	0.68	0.48	0.76	0.74