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IOWA STATE CONSERVATION COMMISSION
DIVISION OF FISH & GAME
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THE RABBIT SITUATION
1950

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In our April Seminar I reported that the January mail carrier reports indicated that the rabbit population increased fn 18 counties from January 1949 to January 1950, while in 10 counties the population remained unchanged, and in 69 counties the population decreased. According to these reports the statewide rabbit population suffered a 47 per cent decline during this period. As was pointed out then, unfavorable weather conditions in 1950 probably had something to do with the small number of rabbits seen by the mail carriers; however, it is felt that the rabbit population was still at a very low level.

The results of our late spring and summer inventories and age-ratio counts are now available. The mail carriers made spring counts from April 3-8 and mid-summer counts from July 31 to August 5 this year. Results from a count taken in March 1949 are available for comparison with the spring counts, but no comparable information for July 1949 is available. In addition to these counts the Conservation Officers and members of the Biology Section made July roadside counts in many counties throughout the State. These roadside counts were made over the same routes used for the February counts. The methods (Sanderson, 1950 for details and methods) were the same as in February except that the July counts were started after sunrise and finished before 6:00 a.m. During the entire month of July, Conservation Officers and members of the Biology Section reported the age ratio of the rabbits they observed during their regular field work. They recorded their results as to county, date, and number of each age group of rabbits seen on a form furnished by us. The results of these two surveys will also be presented in this seminar.

RESULTS

On the basis of the spring mail carrier observations, the rabbit population increased in 30 counties from March 1949 to April 1950, while in 39 counties the population remained unchanged (change of .1 or less rabbit observed per 100 miles), and in 24 counties the population decreased. Reports are incomplete from 6 counties. According to these same reports the rabbit population decreased in five agricultural regions from the spring of 1949 to the spring of 1950 and increased in one region -- Region II in north central Iowa (Table 1). The population remained unchanged in regions I, III and IV. In regions I and II the population remained

essentially unchanged according to the January counts while in the other regions the counts indicated a population decline (Sanderson, 1950). According to these figures the statewide rabbit population suffered a 25 per cent decline from March 1949 to April 1950. This 25 per cent decline may be compared to the 47 per cent decline indicated by the January counts (Sanderson, 1950). There are no figures from July 1949 available for comparison; however, the indicated population densities for July 1950 are shown in Table 2.

Again, the early morning roadside counts resulted in much higher densities than those reported by the mail carriers. These early morning observations were computed as number of rabbits seen per 10 miles instead of per 100 miles as were the mail carrier observations. The counties in which July (July 15-28 incl.) rabbit counts were made and the relative population densities by counties, as determined by the number of rabbits seen per 10 miles are shown in Table 3. The relative population densities by agricultural areas, as determined by the average number of rabbits seen per 10 miles of driving are shown by Table 4.

As was expected, the July roadside densities are somewhat greater than the February densities; however, a comparison of the densities for July (Table 4) and February (Sanderson, 1950) shows that there is a rough correlation between the two. There are, however, some exceptions. Region 8 (south central) has the highest density in both cases, region 1 (north west) has the fifth highest density for both months, and regions 2 and 5 (north central and central) are in approximately the same relative position for both months. However, regions 3, 4 and 6 have relatively higher densities in February than they do in July, while regions 7 and 9 have relatively lower densities in February than they do in July. Of course, these figures will mean more to us as we accumulate information from year to year so that we can compare the February figures for one year with February figures for several other years and the same for the July figures.

As was mentioned earlier, Conservation Officers and members of the Biology Section reported the age of the rabbits they observed during their regular field work during the month of July. The rabbits were classified as young or adult according to size. For the most part there was apparently little difficulty in identifying the two age groups, but as is to be expected there were some doubtful cases. These were listed as age unknown by the observers. Some observers listed a fairly high percentage as age unknown while others listed all the rabbits they saw as either adult or juvenile. Probably some observers experienced more difficulty than others because local weather conditions or other factors allowed a larger early crop of young than did some of the other areas. These early

young would be nearer the size of the adults by July and thus it would be more difficult to determine their age by size than it would to determine the age of the smaller young which were born later in the year. However, only 387 out of more than 5,000 rabbits observed (7 percent) were classified as age unknown. This percentage is not high and probably some of the unknown animals belonged to each age class, thus further reducing the size of the error.

The purpose of an age-ratio count is to determine the breeding success of a species. Thus, if we have an accurate indication of the breeding reserve and an accurate age-ratio of the population after most of the young are out of the nests, we should be able to make population estimates on a relative basis. The number of young per adult is shown for each county in Table 5. For the most part, the individual county samples are too small to be considered separately, however, they are included so that each conservation officer can see where his counties fit into the statewide picture.

Even with the limited information now available, a county by county comparison of the roadside counts and age-ratio information seems to help explain local situations. For example, in February Mills county had a density of 0.5 rabbits per 10 miles, Page had a density of 0.8, Cass a density of 3.3, and Pottawattamie County a density of 1.6 rabbits per 10 miles. In July the officer in Mills county reported that he found no rabbits after repeated drives over his route. At this time Page county had 5.3, Cass 12.7 and Pottawattamie 7.8 rabbits per 10 miles of driving. Examination of the age-ratio for each of the counties in July (Table 5) reveals that Mills had 0.4 young per adult, while Page had 11.0, Cass 2.4, and Pottawattamie had 3.2 young per adult. Thus, it seems that what is obvious is true--that Mills County had a low rabbit population during July because production was low.

With our limited information the statewide comparisons are not always as clear cut as this isolated example appears to be. Table 6 shows a comparison of the age ratios during July and the population densities in February and July, as revealed by the roadside drives. All counties with a February roadside density of 0.0 - 0.9 rabbits per 10 miles were figured as one group for computing age ratios. The same was done for each density class for both February and July. Table 6 further reveals a rough correlation between July population densities and age ratio counts. That is, in general the counties with the higher populations have a greater number of young per adult. This correlation is not absolute, so it should be considered with caution until more information is available. Table 6 also reveals that the February populations with the higher and lower population densities had about the same

production which was higher than the production by the February population with a medium density. Again this may be the result of inadequate information rather than a real difference.

The information contained in Table 6 seems to indicate that at least some counties of all population densities in February had a fair production of young. It also seems to indicate that the 0.0 - 0.9 population density in July is low mainly because the production of young rabbits was low, but that in the areas with higher densities, the production per adult varied comparatively little.

The age ratios for each agricultural area are shown in Table 7. This table reveals that the areas with the highest number of young per adult have the highest July population densities. It also reveals what is considered to be a low to fair production of young in all areas. The results seem to be fairly consistent for all regions except number 3 (northeast). In spite of the fact that this region had one of the higher February densities and had one of the higher numbers of young per adult in July, it has the lowest July roadside density of any region. Perhaps this indicates an unusually high late winter mortality in this particular region for some unknown reason.

It must be remembered that the statewide average of 2.1 young per adult actually indicates 4.2 young per adult female if we assume that the sex ratio among the adults is 50:50. I do not know what is "normal" for Iowa, but I suspect that an average of 4.2 young out of the nest per adult female is a low crop.

In summary we can say that from all available information our rabbit population is still at a low level, in spite of the reports of "hundreds" and "thousands" of rabbits during July and August which were received again this year as usual. The mail carrier reports indicate that the July population is lower than it was last year. However, it is in a better position relative to the past year's population than the February population was. This may be an indication that our rabbit population has started to recover somewhat.

LITERATURE CITED

Sanderson, Glen C. 1950. Pre-breeding rabbit survey - 1950. Paper presented at the second biology seminar - Des Moines, April 12, 1950.

TABLE I

A comparison of the March 1949 and April 1950
Mail Carrier Reports (cottontails) by Agricultural Regions.

REGION	No. Rabbits Seen		Total Miles Driven		R. Seen/ 100 Miles		Per Cent Increase or Decrease
	1949	1950	1949	1950	1949	1950	
I	81	96	18570	20340	0.4	0.5	25 - Increase
II	49	109	19248	18292	0.3	0.6	100 - Increase
III	87	78	17256	19974	0.5	0.4	20 - Increase
IV	104	106	15576	17836	0.7	0.6	14 - Decrease
V	235	112	26316	24878	0.9	0.5	44 - Decrease
VI	157	93	15108	15384	1.0	0.6	40 - Decrease
VII	145	93	11136	12708	1.3	0.7	46 - Decrease
VIII	208	102	12760	12240	1.7	0.8	53 - Decrease
IX	136	85	9228	7212	1.5	1.2	20 - Decrease
STATE TOT.	1202	874	145198	148864			
STATE AVERAGE					0.8	0.6	25 - Decrease

TABLE II

Results of the Mid-Season (July 31 - August 5)
1950 Mail Carrier Reports (cottontails) by Agricultural Regions.

REGION	NO. RABBITS SEEN	TOTAL MILES DRIVEN	R. Seen/ 100 Miles
I	79	15290	0.5
II	92	16302	0.6
III	213	17910	1.2
IV	121	16298	0.7
V	230	25632	0.9
VI	228	12590	1.8
VII	237	11946	2.0
VIII	476	10008	4.4
IX	445	8238	5.4
STATE TOTAL	2121	134214	
STATE AVERAGE			1.6

TABLE III

Results of the summer roadside rabbit counts made by Conservation Officers and members of the Biology Section in July, 1950

COUNTY	Miles	No. R. Seen	R/ 10 miles	COUNTY	Miles	No. R. Seen	R/ 10 Miles
Scott	40	14	3.5	Greene	34	3	0.9
Iowa	22.5	21	9.3	Union	28	43	15.4
Hancock	60	14	2.3	Mills	23	0	0.0
Des Moines	33	6	1.8	Winnebago	78*	88	11.3
Buchanan	30	13	4.3	Dickinson	41	14	3.4
Lee	25	23	9.2	Guthrie	46	17	3.7
Fayette	37	1	0.3	Muscatine	45	15	3.3
Appanoose	34	14	4.1	Mahaska	26	28	10.8
Jefferson	33	32	9.7	Humboldt	36	2	0.6
Osceola	75*	31	4.1	Wapello	37.4	10	2.7
Howard	31	0	0.0	Hardin	39	19	4.9
Blackhawk	40	4	1.0	Decatur	37	31	8.4
Pottawattamie	40	31	7.8	Kossuth	34	12	3.5
Calhoun	30	23	7.7	Buena Vista	33	17	5.2
Butler	35	13	3.7	Cerro Gordo	40	2	0.5
Monona	37	21	5.7	Dubuque	76*	14	1.8
Marshall	25	11	4.4	Benton	37	13	3.5
Lucas	29	12	4.1	Woodbury	85*	21	2.5
Poweshiek	33.9	24	7.1	Cass	30	38	12.7
Mitchell	36.5	4	1.1	Madison	35	17	4.8
Sac	39	25	6.4	Boone	31.8	4	1.3
Polk	35	10	2.9	Keokuk	39	10	2.6
Clay	45	10	2.7	Davis	34	22	6.5
Clinton	42	13	3.1	Jones	40.9	8	2.0
Shelby	33	6	1.8	Delaware	32	13	4.1
Emmet	28	20	7.1	Palo Alto	38	15	3.9
Allamakee	34	7	2.1	Bremer	35	10	2.9
Linn	71.8*	25	3.5	Chickasaw	36	1	0.3
Warren	35	35	10.0	Dallas	25	16	6.4
Page	40	21	5.3	Story	xx	xx	xxx
Cedar	40	8	2.0	Tama	38.5	14	3.6
				O'Brien	32	14	4.4

TABLE IV

Relative Population Densities by Regions,
As Determined by the Average Numbers of Rabbits Seen
Per 10 Miles in July 1950.

AGRICULTURAL AREA	Miles Driven	R/10 Mibs	Total Number of Rabbits Seen
I	292	4.2	123
II	319.5	4.0	135
III	351	1.8	63
IV	304	3.8	116
V	228.2	4.3	98
VI	339.2	3.4	117
VII	133	6.7	90
VIII	198	7.7	152
IX	227.4	5.8	131
STATE TOTAL	2392.3		1025
STATE AVERAGE		4.3	

TABLE V
Results of the July 1950 Rabbit Age-Ratio Counts
Made by Conservation Officers and members of the Biology Section

COUNTY	Rabbits Seen			No. reported as to age	Young per adult
	Ads.	Young	Age Unk		
Adair	40	59	4	99	1.5
Adams				0	
Allamakee	15	18	0	33	1.2
Appanoose	29	75	5	104	2.6
Audubon				0	
Benton	7	39	2	46	5.6
Blackhawk	7	7	2	14	1.0
Boone	4	15	3	19	3.8
Bremer	25	54	10	79	2.2
Buchanan	16	66	0	82	4.1
Buena Vista	17	48	11	65	2.8
Butler	28	63	11	91	2.3
Calhoun	15	26	2	41	1.7
Carroll	3	8	4	11	2.7
Cass	34	81	0	115	2.4
Cedar	12	41	2	53	3.4
Cerro Gordo	15	24	13	39	1.6
Cherokee	7	27	3	34	3.9
Chickasaw	1	5	2	6	5.0
Clarke	26	57	3	83	2.2
Clay	21	95	15	116	4.7
Clayton	6	5	0	11	0.8
Clinton	10	24	4	38	2.4
Crawford	11	27	3	38	2.5
Dallas	4	38	10	42	9.5
Davis				0	
Decatur	21	43	3	64	2.0
Delaware	2	9	2	11	4.5
Des Moines	4	19	2	23	4.8
Dickinson	42	129	18	171	3.1
Dubuque	12	33	7	45	2.8
Emmet	11	47	3	58	4.3
Fayette	16	22	2	38	1.4
Floyd	4	7	1	11	1.8
Franklin	26	97	14	123	3.7
Fremont	5	17	0	22	3.4
Greene	12	8	2	20	0.7
Grundy	8	13	0	21	1.6
Guthrie	37	40	5	77	1.1
Hamilton	57	57	0	114	1.0
Hancock	9	26	8	35	2.9
Hardin	111	47	2	158	0.4
Harrison				0	
Henry	22	43	7	65	2.0
Howard	2	5	0	7	2.5
Humboldt	12	8	0	20	0.7
Ida	8	45	0	53	5.6
Iowa				0	
Jackson	9	23	4	36	2.6

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TABLE V - Cont'd.

COUNTY	Rabbits Seen			No. reported as to age	Young per adult
	Ads.	Young	Age Unk		
Jasper	27	26	2	53	1.0
Jefferson	1	49	1	50	49.0
Johnson	15	127	0	142	8.5
Jones	22	43	2	65	2.0
Keokuk	20	43	8	63	2.2
Kossuth	53	8	1	61	0.2
Lee	31	61	0	92	2.0
Linn	30	98	6	128	3.3
Louisa				0	
Lucas	13	17	3	30	1.3
Lyon				0	
Madison	11	37	7	48	3.4
Mahaska	32	41	7	73	1.3
Marion				0	
Marshall	25	31	0	56	1.2
Mills	20	7	0	27	0.4
Mitchell	4	5	1	9	1.3
Monona	18	40	5	58	2.2
Monroe	0	3	0	3	---
Montgomery				0	
Muscatine	4	23	1	27	5.8
O'Brien	4	10	0	14	2.5
Osceola	147	162	40	309	1.1
Page	10	110	0	120	11.0
Palo Alto	23	49	3	72	2.1
Plymouth				0	
Pocahontas	8	8	1	16	1.0
Polk	2	31	1	33	15.5
Pottawattamie	37	117	5	154	3.2
Poweshiek	19	19	2	38	1.0
Ringgold	8	31	5	39	3.4
Sac	36	99	2	135	2.8
Scott	21	27	6	48	1.3
Shelby	1	5	0	6	5.0
Sioux				0	
Story	6	17	3	23	2.8
Tama	8	20	2	28	2.5
Taylor	7	16	4	23	2.3
Union	18	44	4	62	2.4
Van Buren				0	
Wapello				0	
Warren	9	77	2	86	8.6
Washington	18	77	4	95	4.3
Wayne	27	43	6	70	1.6
Webster	10	7	0	17	0.7
Winnebago	27	155	34	182	5.7
Winneshiek				0	
Woodbury	73	76	22	149	1.0
Worth	2	19	7	21	9.5
Wright	5	10	1	15	2.0
STATE TOT.	1672	3491	387	4685	2.1

70.4 per cent juveniles

TABLE VI

A Comparison of February and July Roadside Densities and Number of Young Per Adult During July.

February 1950		July 1950	
R./ 10 Miles	No. young per adult*	R./ 10 Miles	No. young per adult*
0.0 - 0.9	2.6	0.0 - 0.9	1.0
1.0 - 1.9	3.2	1.0 - 1.9	2.5
2.0 - 2.9	1.5	2.0 - 2.9	1.7
3.0 - 3.9	2.6	3.0 - 3.9	1.8
4.0 - & over	2.1	4.0 & over	2.6

*All counties falling within each density class are averged together for age-ratio information.

TABLE VII

Number of Young Per Adult For Each Agricultural Area Based on July 1950 Age-Ratio Reports.

AREA	Young Per Adult	Feb. 1950 density (R. seen / 10 mi.)	July 1950 density (R. seen / 10 miles)
I	2.0	2.5	4.2
II	2.0	1.9	4.0
III	2.3	3.1	1.8
IV	1.5	2.6	4.8
V	1.2	2.1	4.2
VI	2.8	3.2	3.4
VII	3.1	1.5	6.7
VIII	2.9	1.8	7.7
IX	2.4	1.8	5.8
STATE AVERAGE	2.1	2.5	4.3

PHEASANT NESTING SUCCESS AND BROOD COUNTS

By

Richard C. Nomsen
Game Biologist

Fall counts in 1949 and spring population studies indicated a 20% increase in adult pheasants for our 1950 brood stock. The sex ratio was roughly 3 hens per cock as determined by the winter counts.

Nesting studies were begun in early June. Cards were mailed to 800 farmers requesting information on nests found in hayfields during cutting operations. They were asked to give the number of acres and kind of hay on their farm - date cut - number of nests seen plus the number of eggs in each nest if counted - and the number of hens injured and the number killed.

There were 275 cards returned from the Northern 2/3 of the state with the information requested. The following table lists the totals and results for all types of hay.

Total Number of Acres	6,986
Total Number of nests seen	609
Average Number of Eggs per nest	9.7
Total Number of Nests Hatched	74
Total Number of Hens injured	140
Total Number of Hens killed	93
Total Number of Broods Seen	36

Therefore, farmers saw one nest per 11.4 acres of hay cut. Fewer nests were seen in alfalfa - more nests were seen in mixtures ofhay types.

The 74 nests that we hatched represented 12% of all nests seen. Of the nests seen in red clover, 18% were hatched. Nine per cent of the nests seen in alfalfa were hatched. Clover is usually cut about 12 days later than alfalfa. There was one hen reported killed or injured for each 30 acres cut.

These results will be compared with figures obtained from similar surveys in the future. Density of nests in hayfields will be compared to try and determine a relationship with pheasant populations.

Weather conditions during the nesting and hatching periods were generally wet and cool. Temperatures averaged about 5° below normal. Local heavy rains were frequent during this period. Farm crops

at this time were about 12 days behind the normal schedule.

Fewer broods were reported during June, 1950 than during the same month in 1949. There were 61 broods reported during June this year compared to 142 last year.

Because of the late spring and cool, wet weather, brood counts were taken two weeks later than usual. This year, reproduction counts were made the first half of August instead of the last two weeks in July.

Only 154 cards were filled out and returned by farmer cooperators this summer. They were asked to give their opinion as to the hatching success (better; poorer; same) and the number of adult birds (more; less; same) as compared to 1949.

Farmer Interview Program
Summer 1949 and 1950

	Hatching Success			Adult Population		
Year	better	poorer	same	more	less	same
1950	43%	20%	37%	42%	22%	36%
1949	51%	15%	29%	41%	23%	32%

These percentage figures are a year to year comparison. The majority of farmers thought this years hatch was better than last year - although this percentage was lower than in 1949. These results also indicate a slight increase in the number of adults.

There were 491 cards returned by Rural Mail Carriers with information on pheasant broods. The following table compares the results this year with figures from 1948 and 1949.

Rural Mail Carriers Summer Count
Northern Six Districts

	1948	1949	1950
Average Brood Size	5.9	5.9	6.3
Percent of Hens with Broods	39%	46%	38%
Young per adult hen	2.4	2.7	2.4

The number of young seen per adult hen is the best measurement to compare reproduction success. This figure dropped 11% from 1949 - was the same as in 1948. The reason for this drop from 1949 was

because a lower percentage of hens were reported seen with broods this year. The increase in average brood size partly compensated for this loss.

The Officers Sight Record showed a 11% increase in reproduction success. Figures from 1948 - 1949 and 1950 are compared in the following table.

Officers Sight Record Project

	1948	1949	1950
Average brood size	6.6	7.2	7.3
Percent of hens with brood	63%	62%	68%
Young per adult hen	4.1	4.4	4.9

Northwest and West Central Iowa showed the best results in our reproduction counts.

Final checks on the pheasant reproduction and hatching periods willbe made during and following the open season. Right legs will be collected and measured so that the age ratio can be compared with last years results. Some work will be done aging cock pheasants by bursa depth and measurement of primary wing feathers. The method of aging young cock pheasants by feather measurement that will be used was developed by Carl Trautman of South Dakota. Birds can be aged to the nearest week up to 22 weeks of age. From this data, we hope to establish a peak hatching period for 1950.

Reproduction success studies are an important part of our surveys. But the timing each year must be accurate in order to make comparisons with results obtained from previous years. I believe that more work should be done to refine and develop these studies to increase their accuracy.

EARLY FALL WATERFOWL POPULATIONS
IOWA 1950

By

James G. Sich
Game Biologist

Iowa's waterfowl season opens at noon October 20th one day earlier than in 1949, and closes 6 days earlier than last year. In the neighboring states of Minnesota and in the Dakotas the season opened October 6th, and in Wisconsin the season will open on October 14th. Gunning pressures in Minnesota and in the Dakotas have increased the concentration of migrant waterfowl in northwest Iowa. Since the third week in September, however, large concentrations of migratory waterfowl have occupied state-owned marshes. We should determine the source of this supply and support its perpetuation and care. We can do this by undertaking a limited spring and fall (pre-season) banding program on a small scale.

There appears to be some change in the abundance of several species of ducks so far this fall as compared with 1949 fall populations. Among the early migrants pintails, green-winged teal, and shovelers are seemingly more numerous. Blue-winged teal appear less abundant, and there is little noticeable change in the number of mallards. The number of wood ducks appear about the same as last year. Only a few flocks of geese have been reported in Iowa so far this fall, and on October 8th one flock of about 30 birds, and another flock of about 100 unidentified geese were observed flying southward over East Okoboji Lake. These geese were one of thesmaller species, probably Hutchin'sGeese (Branta canadensis hutchinsi). Only a few Wilsan's Snipe have been observed up until October 5th. White Pelicans have been common visitors in the Spirit Lake area since September 22nd. An estimated 500-1500 pelicans have been frequenting the lakes region so far this fall. These early pre-season observations do not indicate reduced populations of waterfowl, but they may indicate reduced hunting opportunity for some species such as the Blue-winged Teal. It is worthwhile to remember that Iowa hunters killed a large percent of blue-winged teal during the 1949 open season, and that the large kill last fall may have had some effect on the reduced number ofblue-wings present this year.

Concentrations of migrant waterfowl in northwest Iowa began to increase noticeably during the last

week in September. Prior to this date the waterfowl influx was generally slow. Observations would indicate that prior to September 15th most of the locally raised blue-winged teal had grouped into flocks of 5 - 25 birds and acquired a tendency to leave resident marshes. After the first week in September a gradual increase in the numbers of blue-wings were noticed in the marshes. Soon it became impossible to distinguish resident from migrant flocks. It has been impossible to determine or accurately estimate the percent of locally raised blue-winged teal still remaining in Iowa at the present time.

The majority of waterfowl in Iowa observed since September 25th are not locally raised birds. Some species are represented in part by local birds including wood ducks, mallards, some blue-winged teal, and a very few redheads and ruddies. The bulk of the coot, pintails, mallards, shovelers, baldpate, gadwalls, green-winged teal and blue-winged teal are migrant birds. As mentioned before it is desirable to determine the origin and source of these early migrants.

The Value of Small Ponds for Blue-Winged Teal

In the vicinity of some of our larger lakes small potholes and sloughs are almost non-existent. Those few potholes which remain are being filled in or drained out at an alarming rate. This practice is destructive and despicable from a waterfowl standpoint. Small ponds and sloughs, especially in the vicinity of larger bodies of open water are a necessity if blue-winged teal are expected to remain near any open water area. These ponds provide food and shelter for migrant teal which otherwise cannot be expected to remain in the area.

An example of the value of a small pond to blue-winged teal is supported by observations in the Spirit Lake vicinity. One small pond of less than five acres, located west of the Spirit Lake Fish Hatchery grounds, has maintained a fall (migrant) population of from 5 - 100 blue-winged teal throughout the period of September 10th to October 5th. These migrant teal will continue to remain in Iowa until after the open season, and provide hunting opportunities. If this pond and others like it are destroyed these ducks cannot find the food and shelter necessary to sustain life. These birds will simply avoid Iowa during their migration flight. The elimination

of small ponds near open water lake areas in Iowa is especially detrimental to the waterfowl hunting resource, and is unjustifiable from this standpoint. Iowa has reduced the number of productive waterfowl potholes from an uncountable number to so few that they are hardly worthy of counting. Every remaining acre of waterfowl habitat which may be destroyed by agriculture encroachment and can be purchased, should be purchased without delay. Every acre of waterfowl habitat which can be restored and unproductive land should also be restored. Filling, tiling and drainage are still reducing what little waterfowl habitat remains in Iowa faster than it can be restored, and there is very little left. The only solution is to steadily continue the basic program of acquisition, restoration and development.

Notes on Aquatic Vegetation

Most of the common emergent marsh plants in Iowa are perennials. Stands of bulrush, cattail, and reed grass (p. communis) remain year after year in almost a fixed position in a marsh or slough. Over a period of years there has been an observed change in the density of many stands of emergent plant species in many of Iowa's state-owned areas. In some areas vegetation has been completely eliminated. This change is sometimes abnormal and usually detrimental to cover conditions within the marsh. Often it is desirable to increase the density of marsh plants already present, and in other cases it becomes necessary to establish a completely new vegetative cover.

Re-vegetation of barren areas, and increased aquatic plant densities have been accomplished by complete or partial drainage and refloodings. The most successful example was the drainage and re-vegetation of Round Lake, Clay county, Iowa. East Twin Lake, Kanawaha, Iowa was drained during the late winter and early spring of 1950. On the practically barren lake bed, which was exposed to air during most of the summer of 1950, excellent growths of emergent marsh plants have reappeared. This new vegetation grew from lining seeds and root stocks present on the lake bottom. No artificial or man-made planting was necessary. Drainage alone was required to re-establish emergent vegetation in East Twin.

Drainage is not always practicable on some state-owned areas, and it is physically impossible on others. For this reason it is desirable to determine other practical methods of re-establishing food and cover plants. For two growing seasons a very hardy strain of Wildrice (Zizania aquatica) has been studied in Cheever Lake, Emmet County, Iowa. The growth and reproduction of this plant species

in Cheever Lake is worthy of mention and record. It is not known if this wildrice was native to Cheever Lake or introduced.

During 1949 a sparse, scattered stand of wildrice grew along the eastern edge of the lake and a fairly dense patch of rice was located across the lake at the northwest corner. During 1950 a heavy marginal growth of rice replaced the thin scattered stand of the previous season along the east lake shore. This reproduction and growth took place along a very shallow shore margin on top of a deep muck soil. It is important to remember that wildrice is an annual which re-seeds itself each autumn. The seed is supposed to over-winter in water if it is to germinate the following spring. If this wildrice seed remained over-winter in the same location in Cheever Lake where it grew in 1950 it did not over winter under or in water. In this location the ice was frozen to the bottom, although the muck itself may not have been entirely frozen, and may have retained enough moisture to over winter the seed in a living conditions. Another explanation is that the seeds may have over-wintered in the deeper parts of Cheever Lake (3-4 feet) where some water remained unfrozen beneath the ice. In the early spring these seeds may have been washed shoreward taking root and growing.

Additional evidence supports the contention that this wildrice seed over-wintered in a liveable condition beneath ice with little if any water. Rice seed from Chever Lake was planted in the fall of 1949 in Mud Lake Slough, Emmet County by Harold Johnson, Conservation Officer, and in the marshy ditch between Round and Trumbull Lakes in Clay County by Stub Severson, Area Game Manager. In both locations this wildrice germinated and grew, producing seed which is expected to produce a larger crop in 1951. In both of these locations it was possible that the seed over-wintered in unfrozen muck due to seepage movement of water causing the absence of frost beneath the ice. There is not evidence to show that this hardy strain of wildrice cannot reproduce itself in some of our prairie marshes in suitable locations.

Still another example illustrates that this wildrice seed is resistant to winter kill. In the small pond just east of Cheever Lake, and just north of the access road, there has been an isolated growth of wildrice during 1948, 1949 and 1950. During the late fall of 1949 this pond bottom was completely dry, and even though much of the rice seed was winter killed, some survived to reproduce itself. This pond is again filled with water and a good crop of wildrice is expected next year.

Several experimental wildrice seed plots in Prairie Lake, Dickinson County; and in Mud Lake and Mud Lake Slough

Emmet County, have been sown this fall in an effort to determine if fall sowing is successful. Artificial over wintering of wildrice seed in water, and spring planting may be more successful. It is possible that this strain of wildrice might produce an annual cover crop, or provide a nurse crop for other emergent plant species in otherwise barren shallow water areas. The success, in an attempt of this nature, would depend largely upon learning how and where this would be practicable.

There is a note of interest to those who would immediately concern themselves about black birds eating the wildrice crop. It is true that the birds appear to do this, but by observing them carefully through field glasses it could not definitely be established that they were eating wildrice. The blackbirds may just as likely have been searching for insect larvae (catepillars) which were very numerous on the fruiting seed heads and seriously damaging the wildrice kernels themselves.

Aquatic Plant Growth

The 1950 growing season in Iowa has been excellent for practically all emergent aquatic plant species. In several lakes where water levels were too high, emergent vegetation did not increase in density and amount. In the majority of Iowa lakes and marshes emergent vegetative growth has improved while observations would indicate that the reverse situation is true regarding submergent aquatic plants. For all practical purposes the submergent aquatic plant crop was satisfactory this year. During this early fall season most of the lakes and marshes have more water in them than was present last fall at the same date.

Water level elevation measuring devices are needed on all of our major state-owned marshes. The outlet control structure has been completed at Four Mile Lake, Emmet County. In this lake the water level has remained several inches higher during the late summer and fall of 1950 than was possible during 1949. Hottes Lake, Dickinson County has had several inches less water in it during 1950 as compared with 1949. Hottes Lake is one of the few marshes in which the water level has been continuously lower throughout the growing season of 1950.

IOWA QUAIL, SPRING AND SUMMER 1950

By

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Game Biologist

Economical use of time by cooperating personnel requires general quail population surveys and detailed counts made locally, which will confirm figures obtained from statewide surveys. Mail Carriers counts, and whistle counts are of a general nature. Permanent check areas furnish the information confirming trends in population.

The 1950 April Mail Carriers Census

The Mail Carriers census of quail is carried on by volunteering carriers over their route for a 6 day week. All game birds seen are recorded. The 1950 April Mail Carrier census of quail was made during a cold windy period. In 1948 and 1949 the census was made during a period in March when there was some snow. This survey is general rather than being a concentrated count, and in order to get the proper value from the figures, it is necessary to compare the figures from the several agricultural districts rather than using the figures from separate counties.

The 1950 survey showed an average count over the state of 1.1 birds seen per 100 miles of carrier route compared to 1.2 birds seen in 1949 and 2.8 birds seen per 100 miles in 1948.

District 9, the southeast, showed the best count, 3.2 birds per 100 miles compared to 2.6 in 1949, and 3.3 in 1948. District 6, the east central district, was second, and the count per 100 miles was 1.8 birds in 1950 and 6.1 birds per 100 miles in 1948. The figure 6.1 is high. The weather may have effected the count since there was snow in 1948, or the estimates may have been high. Nevertheless, the high count, though perhaps abnormal, would indicate that the east central was a well populated section.

The central and southwest had the low counts of .2 birds per 100 miles. The northeast district and south central were .7 and .6 birds per 100 miles of mail carrier route.

Carrier counts made in winter, spring and fall all agree in rating the southeast as having the heaviest quail population. Districts 6 and 8, the

east central, and south central hold second and third places at all seasons, but do not always place in the same order of importance.

In five of six cases, the 1948 and 1949 mail carrier count indicated the relative success of the following fall. Except in the case of northeast Iowa where quail hunting is done on a small scale, and in southeast Iowa, the amount of time required for bagging quail had doubled since 1947. The mail carrier census indicated a decrease in all except these two cases.

The mail carrier counts through April 1950 indicate 1950 hunting success similar to 1949 in the east central, the south west and the south east; and below that of 1949 in the northeast, central and in the south central.

The 1950 Statewide July Whistling Quail Count

The count of whistling quail was made by conservation officers in 30 Iowa counties. Two routes of about 12 miles each were laid out in each of the thirty counties. One route was in the north, one in the south part of each county. One stop was made per route mile.

When possible, the route follows all weather roads. Driving is adjusted so that the mileage corresponds to major soil types; for instance, Warren county major soils are: 25.1% Tama Silt Loam, shallow phase; Grundy silt loam, 11.1%; Muscatine silt loam, 5.9%; Shelby loam 29.1%; Carrington silt loam 3.5%; Wabash silt loam 11.6%; Wabash silty clay loam 2.1%.

Driving corresponds to the above, or 2.1% of the approximate 12 mile route is Wabash silty clay loam, and 25.1% of the route is over Tama silt loam. Other soils are sampled on the route in the same manner.

This method of determining a route not only samples the various soil types, but it places the driver in the areas intervening between good and ppor producing lands, or in the edge or marginal areas where quail may be found.

In addition, material is available on 18 routes run in 1947, 1949 and 1950. Counts were made the last part of July. The peak of calling occurred about mid-July and the census was made after calling had leveld off.

Some misunderstanding of instructions did occur and some officers counted whistles instead of counting whistling quail. Check routes had, however, yielded the information that the average calling bird called from none to seven times per minute or an average call rate of 3.5 times per minute and the excessive counts were eliminated or corrected by the average figure.

The southeast showed, after correction, 2 birds calling per mile of route. The south central had a count of 2.1 birds per mile. East central, 1.5 per mile, Central 1.3 birds per mile, Northeast 1.1 birdsper mile, and south west showed a count of .96 birds per mile of route. Check routes revealed that seven birds was a large number of birds to be heard at one stop.

On the Wapello county check area of above average population, eight quail whistled regularly during the height of the calling period, but all could not be heard from one stop. In Page county 17 birds were heard in 26 miles of driving. In Cedar, Johnson, Louisa and Wayne counties, the average reported was about 4 birds per mile. In the southeast, where it is certain only birds, not whistles, were counted, the average was about 2 birds per mile.

On routes checked in 1949 and 1950, Clarke county showed in 1949, .76 and in 1950, 1.3. Henry county showed in 1949, 3.8 birds calling per mile of route, and 3.8 birds in 1950.

Johnson county in 1949, 2.6 birds calling per mile, in 1950, 2.3. Mahaska county, 1949, 1.4; 1950 1.4. Monroe county, 1949, 1.; 1950, 1.3. Polk county, 1949, .5; 1950, .7.

Wapello county, 1949, .8; 1950, 1.7. Washington county, 1949, .7; 1950, 1.2. Wayne, 1949, .2; 1950, 3.6. In the year 1947, counts were generally higher than they were on the same routes in 1949.

Without any correction, officers counts showed in 1947, 2.66 birds per mile, in 1949, 1.35, and in 1950 2.6 birds per mile of check route. In Missouri the highest recorded count for 1939 was 3.54 calling birds per mile. Even after correction, the 1950 count shows on routes run all three years, an increase from 1.17 birds calling per mile in 1949 to 1.9 calling birds per mile in 1950. This is an increase of 39%.

The 1950 Quail Broods, Wapello County Check Area

The Wapello county check area near Ottumwa, is about 400 acres, and includes all or parts of eight farms.

In 1949, in the fall, four coveys consistently used the area, and two other coveys were occasionally on the area. This summer, the area has been checked two or more times a week.

Use of dogs was restricted until the hay and grain crops were harvested. Dogs could be run for short periods. A fast dog could be worked for only one hour per day because of the heat and the dust. Field borders could be worked, but success was confined to the days when there was heavy dew, or when it was cool and rainy. Covey calls have been heard on the area, and usually the calls were from cornfields, or brush where it is impractical to work a dog.

Farmers report seeing birds while cutting weeds in cornfields. Birds located with dogs have been in short cover on the sunny side of brush, or following thinly grown cover lanes. Findings were during damp or wet periods when going was unpleasant in cover. It is probable that cover is so much in use by quail that success with dogs willbe low until hard freezes, and corn harvest permit working every foot of the territory.

All farmers on the Wapello county area are interested in quail numbers. These men have reported 15 covey sightings when birds in the coveys were counted. Four of the coveys have been located one or more times with the use of dogs. All were on the east side of the area when seen.

Search was made of other parts of the area, road dust was watched for tracks, and the creek bed has repeatedly been checked. Also covey calls have been heard in the south part. A total of at least seven coveys is using the area. Possibly there are more.

The average covey size is 13 birds. One covey of six young of mature size was seen August 6. One covey of thirteen young four or less weeks of age was seen the same day.

Approximate hatching dates of young on the area

are: the week of June 1, week of July 1, and the week of July 12. A farmer in Keokuk county on October 9 reported seeing during the past week a covey the size of sparrows. These birds would be about six weeks of age, and the hatch date would be about September 1.

Shortly after June 1 search was begun for young. But it was not until August 6th that the first covy or 6 young was seen. These birds were out of the wet on a board fence bordering a lane on the area. Every covey, and its size was seen and reported by one of the farmers before being located by use of the two dogs.

The east end of the area contains a large percent of land open after hay and grain harvest.

Fields are clover, pasture, and grain bordered by brushy fencerows, or small cornfields. The west end has considerable brush: part is seeded down, and not harvested, corn and beans and pasture of brushy land makesup the balance.

No coveys have been located by the biologist in the west end, but one covey has been heard calling, and tracks have been found in the creek and in the roadways. Reports by farmers were adjusted to the known covey ranges of last winter, and the signs found did make it possitive that coveys range the west end of the area. Thus, it is known that seven coveys use the check area.

Permanent Quail Check Areas

Population checks on the permanent Iowa check areas have been estimated after the officer has covered the areas as intensively as possible, and after asking how many coveys the farmers have seen. Because of the dry and hot weather, the use of dogs has been restricted: after two days work a fast dog had to be rested for several days because of eye affliction, probably because of dust and pollution.

1950 winter population on the areas were: Lee county, thirty birds; Linn county, 19 birds; Ringgold county, 34; Wapello county, thirty five birds; Warren county, 13 birds.

Summer populations are: Lee 48; Linn county 30; Wapello county, 77; Warren county, 50.