

Report #646  
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## Report on Waterfowl Survey Work During Spring of 1941

The work during the spring (April through June) was concentrated on the following:

1. Taking notes and making observations of the spring migration of waterfowl in Michigan.
2. Obtaining data on the incidence of lead poisoning and occurrence of body shot wounds in late spring migrants as "follow-up" work started last winter.
3. Obtaining data on the occurrence, availability and significance of lead shot pellets present on the bottom of the lakes frequented by feeding waterfowl.
4. Making a nest survey.

### SPRING MIGRATION OF WATERFOWL

#### Migration data

Migrants began to arrive as early as March 20 in the southeast corner of the state, especially at the mouth of the Detroit River. Waterfowl concentrated here until the ice left on the waters farther north, and then moved through the state more rapidly than usual.

A calendar of flight dates at various points in the state was recorded by Game Division personnel (Refer to chart No. 1). This chart shows that the advance of waterfowl immediately follows the ice break-up. The rapid and early spring break-up in the northern part of the state allowed the migrants to traverse the state in a comparatively short space of time. Following a concentration at the southern boundary the main flights of the migrants arrived at all points in the state within 10 days, covering a north and south distance of approximately 400 miles.

#### Abundance

Data on comparative abundance of waterfowl this spring obtained by personal interviews with sportsmen, guides, outfitters, and Departmental employees in the study areas revealed the following:

Eighty-five observers were contacted: 49 reported more, 21 reported same, and 15 reported less in comparing abundance of waterfowl this spring to the spring of 1940. These data show 81% of the observers reporting more or same. Judging from this it appears there was an increase in the number of migrants passing through Michigan this spring.

### Notes regarding spring flights of waterfowl:

Observers noted a remarkable increase in the number of Canadian geese passing through the Saginaw Bay area. Many stated it was the largest number of spring migrants they had seen in 20 years.

Pintails exceeded the previous year's abundance in the Saginaw Bay and St. Clair Flats areas.

There was a delayed break-up of ice in Lake St. Clair study area and many divers apparently passed over, with the few that stopped staying but a short time. This is considered unusual as Lake St. Clair generally has large concentrations of diving ducks for rather extended periods.

The lower part of the Detroit River and Lake Erie had large concentrations of canvasback and scaup. On March 27 an estimated number of 400,000 ducks were concentrated along about 7 miles of the east shore of Grosse Isle; 90% of these were estimated to be divers. Of these divers, 40% were canvasbacks, 40% scaup, and the remaining 20% redheads, buffle heads, mergansers, and golden eyes. The surface feeders were mainly black ducks.

Judging from comparative personal observations of 10 years ago, there appears to be an increase of breeding blue-winged teal, pintails, and black ducks in the Saginaw Bay area.

### DATA ON LEAD POISONING AND BODY SHOT WOUNDS

#### Methods and Equipment:

Obtaining data on the incidence of lead poisoning and the significance of body shot wounds was continued during the spring. These data were obtained by live-trapping ducks\* and examining them by the use of X-ray and the fluoroscope. The same technique was used for making fluoroscopic examinations as during the winter. (Refer to Report on Waterfowl Survey During Winter). The fluoroscopic examinations revealed ingested lead pellets, shot pellets lodged in the body, and bone fractures. The absence of lead pellets in the gizzard was used as evidence that the duck was not suffering from lead poisoning.

#### Representative Group Samplings of Waterfowl for Fluoroscopic Examinations:

Precautions were taken to obtain representative samplings of wintering ducks, early spring migrants, and late spring migrants. Since ducks were taken at three scattered trapping sites at selected intervals of time and at selected types of habitat, it appears that a fairly representative sample of each of the three groups was obtained.

In order to get these group samplings three live-trapping sites were selected. They are as follows:

\*The ducks were banded with Fish and Wildlife Service bands before being released.



1. Sulphur Springs habitat in Monroe County - free of ice during the winter due to high salt content and high temperature of water. Ducks concentrate here throughout the winter. Ducks live-trapped at this site during February were considered wintering ducks.

2. Detroit River habitat in Wayne County - free of ice intermittently at channels resulting from strong river currents and changes in temperature. When field observations indicated a marked increase (from 11,000 to 250,000) in waterfowl population this spring, live-trapping operations were started. These ducks were classed as early spring migrants, possibly representing some of the ducks wintering immediately to the south of Michigan.

3. Sebawaing Bay habitat in Tuscola County - an area that does not have any winter residents because of complete ice coverage. Live-trapping operations were started when field observations indicated a decrease in migrating waterfowl, and trapping was terminated when observations indicated the waterfowl population appeared to remain rather constant in that vicinity. Ducks taken here were classed as late spring migrants. However, a portion of these ducks may have wintered in Michigan, but with thousands of migrating ducks present at the trapping sites chosen for taking migrants, it appears unlikely that many wintering waterfowl were live-trapped. No birds banded during the winter were recaptured at the Detroit River, or Sebawaing Bay trapping sites.

Summary of data resulting from fluoroscopic examinations for lead poisoning in late spring migrants:

Total number of ducks examined -- 51.

Total number of ducks carrying lead pellets in the gizzard -- 0.

This sampling of 51 ducks represented lingering spring migrants, frequenting feeding beds heavily shot over by hunters. (For more complete data refer to chart No. 2). These data showed that lead poisoning was not an important mortality factor among the late spring migrants in Sebawaing Bay, although they were feeding in an area where bottom samples showed the presence of lead shot pellets. No reports were received of waterfowl dying of lead poisoning this spring. This is considered unusual, as in the past some of the most serious outbreaks have occurred at this time of year.

Summary of data resulting from fluoroscopic examinations for gun shot wounds in late spring migrants:

Total number of ducks examined -- 51.

Number of ducks carrying shot pellets as body wounds -- 15.

Percentage of ducks carrying shot pellets as body wounds -- 29.4%.

80% of the wounded birds had one shot.



Total number of ducks having functional wings with a healed fracture -- 2.

Percentage of ducks having healed functional wing fractures is very small (3.9%).

Eight species of waterfowl were examined, including black ducks, pintail, mallards, blue-winged teal, coots, wigeon, scaup, and a Canadian goose.

#### Discussion of significance of body shot wounds:

The high percentage of ducks having wounds caused considerable speculation last winter when this work was first started, as to the importance of body shot wounds, in holding ducks in Michigan waters throughout the winter.

If gun shot wounds were an important factor it would seem that the ratio of wounded to unwounded live-trapped birds examined during the winter should be higher than in the early and late spring migrants. The limited amount of data gathered does not indicate that such is the case. The high percentage of ducks carrying body shot wounds has remained constant throughout the study. (Refer to chart No. 3). From this, it might be concluded that, although some convalescent ducks remain here as winter residents, gun shot wounds are apparently unimportant in relation to the wintering duck population in southeastern Michigan. However, larger samples must be handled before definite commitments are made.

The high percentage of ducks carrying gun shot wounds (approximately 30%) indicates that ducks have remarkable ability to recover from some types of shot injury. Observations of the 125 wounded ducks examined showed that a large majority had only flesh wounds. Shots deep in the body cavity were so few as to indicate that few ducks survive when their internal organs are injured. From this it may be inferred that the majority of the surviving wounded ducks have superficial wounds, many of which are caused by "spent shots." (Fig. 1 and 2)

The wounds found in a large number of ducks returning to their nesting grounds presumably are an accumulation from several hunting seasons. Moreover, it is likely that a single duck may be injured more than once, as indicated by different sizes of shot found in several individuals. Note in the picture (Fig. 3) the size of the shot in the lower left hand corner in comparison to the others.

The significance of the wing shot data is unusually speculative. The best that can be said at present is that the number of healed fractured wings in comparison to the number of wounded ducks is so small as to indicate that if a duck is "winged" it has a small chance for survival. In considering the numbers of "winged" ducks shot down in the marshes that are not retrieved these data assume importance.

Fig. 1. The X-ray photograph shows a live-trapped black duck carrying ten body shot wounds identified by the round black dots. This duck was normal in weight and showed no physical defects when released. This photograph is also an illustration of the view seen through a fluoroscope.

Fig. 2. Above is an unusual photograph showing a healed fractured wing with a shot lodged within the hollow wing bone (radius). The subject was a live-trapped male mallard that had another shot in the neck. The bird was in good flesh and appeared normal when released. The two X-ray photographs were taken by Dr. S. C. Whitlock, Game Division pathologist, who interpreted the X-ray and fluoroscopic examinations.



### SAMPLING FOR OCCURRENCE OF LEAD ON LAKE BOTTOMS

Data on the occurrence, availability, and significance of lead shot pellets present on the lake bottoms frequented by waterfowl are limited at present to one sample area located at Fish Point Bar in Sebawaing Bay, a part of the Saginaw Bay study area. This sample area was chosen because it is public shooting ground heavily shot over throughout the hunting seasons; it contains good feeding beds, and is frequented by an abundance of waterfowl.

Live-trapping operations were carried on here to obtain specimens for examination with the X-ray and fluoroscope, to determine whether the ducks frequenting feeding grounds heavily shot over were picking up lead pellets and thereby contracting lead poisoning.

Trapping operations were timed to take the late spring migrants. Those that had stayed longest and were lingering behind the main flights appeared to be the most likely suspects. As previously stated, the examination showed the live-trapped birds were not picking up lead shot. Following the trapping operations, samples of the bottom were taken and screened.\* The bottom samples showed lead shot to be present at the rate of 1 pellet per 3.5 square feet as an average, with 3 pellets per square foot as the maximum. (For more detail, refer to attached chart No. 4).

This limited amount of data appears important not only for the information obtained for the area but especially for the various questions that arise in attempting to evaluate the data.

One of the factors most apparent at present is the quantity and quality of grit present on the feeding beds. (Fig. 3) Since ducks probably pick up lead pellets from the bottom in their quest for grit, it appears the presence of a large quantity of fine sharp gravel would materially reduce the chances of a duck picking up enough lead to cause death.

Because of the large quantities of grit in proportion to the numbers of shot in this particular type of habitat, it appears that the presence of lead is relatively unimportant as a mortality factor of ducks. This statement applies only to this one particular sample area on Fish Point Bar. Continuance of this type of work is anticipated.

The screenings left in the sieve from one square foot of bottom sample varied in size from about that of No. 3 shot (.084 inches in diameter) to buckshot (.24 inches in diameter). This does not represent all the available grit as smaller and larger particles are not collected by the sieves. These bottom samples were taken down to a depth of approximately 3 inches.

\* The technique used on obtaining these bottom samples was the same as described by Thos. L. G. Osmer (The Scientific Monthly, Vol. L, pp. 455-457).

Fig. 3. Throughout the area sampled, large quantities of fine grit were found as may be observed in the picture above of a sample of screenings. One shot indicated by the arrow was found in this 1 sq. ft. of bottom sample.



## RESULTS OF NESTING SURVEY

Michigan has a vast acreage of suitable nesting habitat with thousands of miles of shoreline on various types of lakes and streams allowing ducks to spread out to the extent that nesting survey work is largely unprofitable.

In 1934, a crew of men worked on the waterfowl nesting problem. The data obtained strongly indicated that our waterfowl are so widely scattered over the state that any accurate check made at nesting time is of little or no importance, mainly because so few nests were found.

For this reason, an extensive nesting survey was not attempted, but instead Lone-Tree Island in Saginaw Bay was chosen as a sample plot representing a type of the best nesting habitat. This small island of 12 acres of land was thoroughly searched. Four duck nests were found: one blue-winged teal nest, two pintail nests, and one redhead nest. This gives an average of one duck nest per three acres, which probably represents a high nesting population on some of the best nesting grounds in Michigan. Individual records for each nest were kept but these data are too incomplete to be of value. Many coot and pied-billed grebe nests were found in the adjacent marsh, and common tern nests were in abundance.

Besides making an intensive census, a considerable amount of time and effort was spent looking about Sebawaing Bay. The following notes are recorded as resulting from these observations.

It appears that more information for determining the importance of an area for producing ducks can be obtained by a brood survey than from a nesting survey in the Michigan type of habitat. Efforts to take a brood survey will be made during the ~~summer~~ <sup>summer</sup>.

The species of ducks seen, in order of their abundance, during the nesting season were black ducks, blue-winged teal, mallards, and pintail. Scaup, ringnecks, redheads, and shovellers were seen but are considered rare.

Coots are nesting here in a greater abundance than in previous years. The increase in a marsh type habitat has given this species more area in which to build their floating nests.

The continued presence of 300 to 400 ducks in the same general location during nesting time may serve as an indicator that a satisfactory proportion of them are nesting, even though some may be non-breeders.

It appears that one of the most important factors limiting reproduction in this area is the extreme fluctuations in water-levels caused by wind.

Two redhead nests, each with ten eggs, were found in Sebawaing Bay. (Fig. 4). This is worthy of mention since they are the first records

of redheads nesting in this state since 1880, when a nest was found on St. Clair Plate in St. Clair County. The waterfowl habitat in Sebewaing Bay has undergone some remarkable changes during the past 12 years, which probably accounts for the presence of nesting redheads. Briefly, this bay is rapidly changing from a wave-swept, open expanse of shallow water to a reed and marshy area offering a more desirable waterfowl habitat. The causes and significance of these changes in habitat will be studied and discussed more fully at a future date.

Fig. 4. A redhead nest on a muskrat house in a small island of cattails and bullrushes. Less than 8 years ago this site was a wave-swept sandy beach.



## SUMMARY

1. Migrants traversed the state in a comparatively short time which may be correlated with the rapid spring breakup in the north.
2. There appeared to be an increase in migrants, both surface feeders and divers, in comparison to the spring of 1940.
3. Limited data from fluoroscopic examinations of late spring migrants in Sebawaing Bay showed ducks were not suffering from lead poisoning and although lead shot was present on their feeding grounds, this data shows the ducks were not picking up the pellets.
4. No reports of lead poisoning were received this spring from anywhere in the state.
5. Data from fluoroscopic examinations indicate that body shot wounds are relatively unimportant in holding ducks in Michigan throughout the winter.
6. Interpretation of the data on wing fractures is speculative at present, but indicates that a high mortality occurs among wounded birds that escape from hunters.
7. The data indicate that the number of ducks carrying body shot wounds may be accumulated from several hunting seasons.
8. The abundance of grit on the feeding grounds appears to lessen the importance of the presence of lead shot because the chance of picking up lead in sufficient quantities to cause death is reduced.
9. The sample plot studied, judged to represent the best type of nesting habitat in Michigan, had a nesting population of 1 nest per 3 acres.

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## WATERFOWL MIGRATION CALENDAR OF MICHIGAN

Spring, 1941

Game Area or Station	County	Lake or Marsh	Date Ice Left	Date of First Migrants	Date Main Flights Arrived	Approximate date Majority of Migrants Left	Principal Species Observed	Comparative abundance	Notes
Detroit River Area	Wayne	Livingstone Channel	March 25	11,000 resident ducks all winter March 25	April 1	April 16	Divers	More	Oil pollution present. No serious damage or mortality noted. Migrants held over longer than normal.
Rose Lake Wildlife Experiment Station	Livingston	Rose Lake Mud Lake Vermillion Creek	April 3-4	April 5	April 15	April 20	Surface feeders	More surface feeders	Decrease in ring-necks this spring as compared to 1940.
Swan Creek Wildlife Experiment Station	Allegan	Ottawa Marsh	Intermittent break-ups all winter.	March 25	April 12	April 25	Surface feeders	Same	Migrants stayed longer than 1940. Mild winter allowed ducks to winter.
Lake St. Clair & St. Clair Flats	St. Clair & Macomb	Lake St. Clair	April 10	April 10	April 12	April 20	Divers. Surface feeders important	Less. Except in crease in pin-tails	Spring flight unusually light. Believed to have passed over because of ice conditions. April 15 divers left, surface feeders present in abundance.
Saginaw Bay Area	Huron	Sebewaing & Wildfowl Bay	April 5	April 5	April 10	April 20	Divers & surface	More Great in-	No ducks wintered here. Good local nesting population.



## RESULTS OF FLUOROSCOPIC EXAMINATIONS

Location of trapping sites	Representative sample of	No. of ducks examined	Occurrence of lead in the gizzard		Occurrence of body shot wounds		Occurrence of wing fractures			
			Times of occurrence	Percent	Times of occurrence	Percent	Functional		Non-functional	
			Times of occurrence	Percent	Times of occurrence	Percent	Times of occurrence	Percent	Times of occurrence	Percent
Otter Creek Sulphur Springs Monroe County Michigan	Wintering ducks	236	1	0.42	70	29.66	10	4.24	0	0
Sugar Island Wayne County Michigan	Early spring migrants	131	1	0.76	40	30.54	2	1.53	0	0
Fish Pt. Bar Tuscola County Michigan *	Late spring migrants	51	0	0.00	15	29.41	2	3.92	0	0
Totals		418	2	0.48	125	29.62	14	3.59	0	0

\*Data obtained this quarter (April-July, 1941)

## BODY SHOT WOUND CHART

Location of trapping site	Representative sample of	Number of ducks examined	Total number having shot wounds	Number of pellets per duck											
				(Showing times of occurrence)											
				1	2	3	4	5	6	7	8	9	10	11	12
Otter Creek Sulphur Springs Monroe County Michigan	Wintering ducks	236	70	41	12	10	4	1	-	-	-	1	-	-	1
Sugar Island Wayne County Michigan	Early spring migrants	131	40	26	6	4	2	1	-	1	-	-	-	-	-
Fish Pt. Bar Tuscola County Michigan *	Late spring migrants	51	15	12	1	1	-	1	-	-	-	-	-	-	-
TOTALS		418	125	79	19	15	6	3	-	1	-	1	-	-	1

\*Data obtained this quarter (April-July 1941)



## CHART OF BOTTOM SAMPLES

Shows the Amount of Available Shot Determined by Screening  
1 Square Foot Area of the Bottom of Feeding Beds

Location of sample	County	Area Sampled	Number of Sample Lines	Number of Samples Obtained	Number of Shots Found	Shot per Square Foot of Bottom	Amount of Grit	Type of Habitat Sampled	Type of Vegetation	Rated as to use for duck feeding area	Rated for use as a hunting area
Fish Point Bay	Tuscola	1	1	25	8	.32	Abundant	Active type bottom resulting from wave action and currents	Submerged aquatics sparse emergent reeds medium	Abundantly	Abundantly
Cogan Marsh	Tuscola	2	1	10	2	.2	Common	Silt accumulating at delta of drainage ditch	Submerged aquatics abundant. Emergent reeds abundant	Abundantly	Abundantly
TOTALS				35	10	.28					

Description of terms used:

Amount of Grit	(Abundant (Common (Scarce (None	Rated as to use for feeding areas and as hunting areas	(abundantly (frequently (commonly (occasionally (seldom
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