

A COMPOSITION STUDY OF THE
WATERFOWL POPULATION ON THE
HURON RIVER IN THE VICINITY OF
ANN ARBOR, MICHIGAN

by
Lee Richard Crail

1947

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A COMPOSITION STUDY OF THE WATERFOWL
POPULATION ON THE HURON RIVER IN THE
VICINITY OF ANN ARBOR, MICHIGAN

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Lee Richard Crail

A dissertation submitted in partial fulfillment of the
requirements for the degree of Master of Forestry in the
University of Michigan

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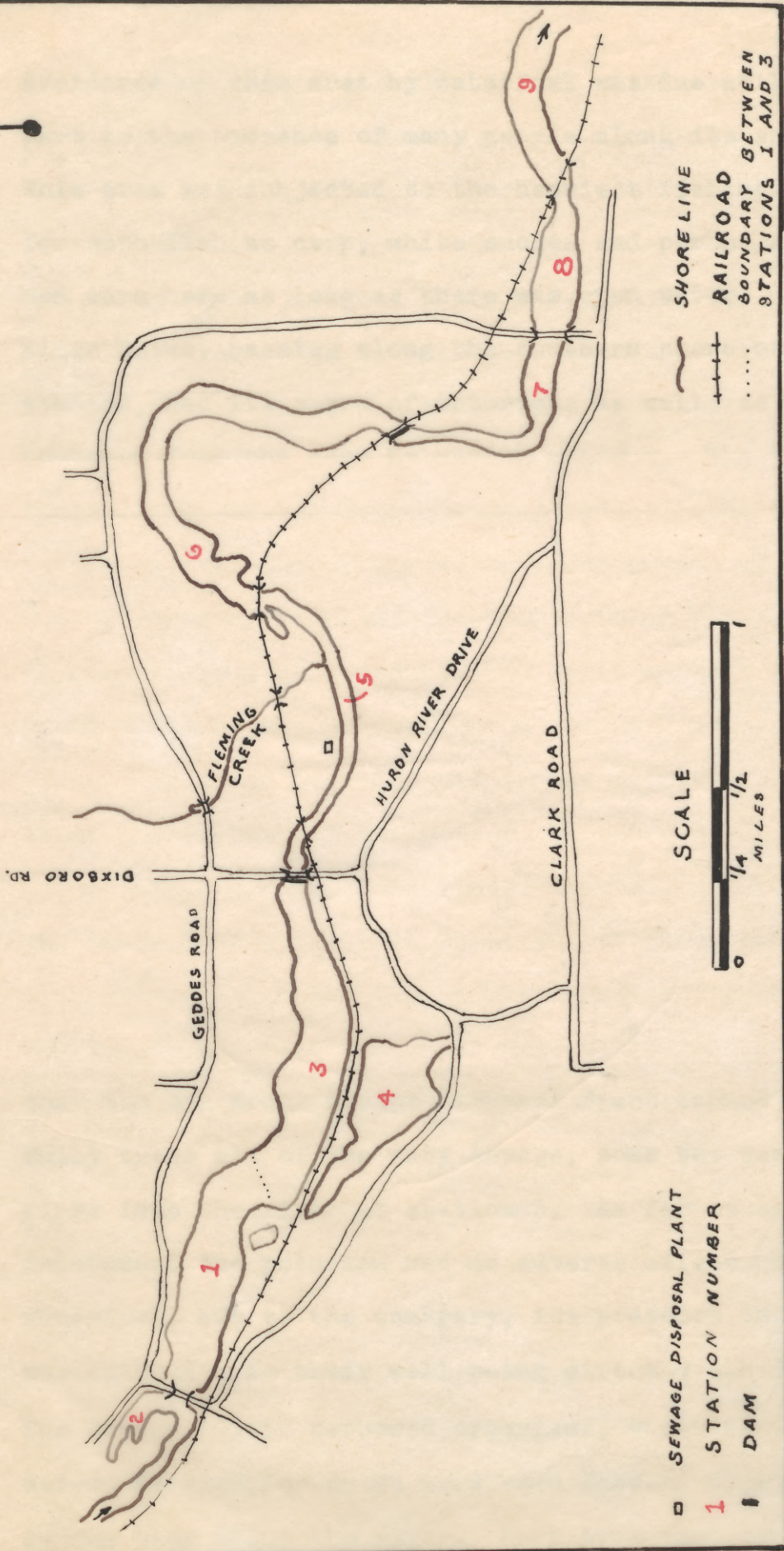
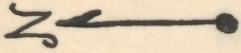
INTRODUCTION

It has been the purpose of this study to observe the waterfowl concentrations on the Huron River in the vicinity of Ann Arbor, Michigan, noting dates of arrival and departure, sex ratios, plumage changes, courtship and general behaviors. In order to establish correlations between water areas and the waterfowl using them, nine arbitrarily chosen stations were established (see map on following page). The field notes included the list of species observed at each station, giving the numbers seen, and when possible, the sex. The total number by species was obtained by adding up the station totals, avoiding duplication when a bird was flushed from one station to another. The grand total was then determined by adding the totals for each species. A total of 62 field trips was made from September 16, 1946, to April 27, 1947, during which time 24 species of waterfowl were recorded, including the coot. Because of the distance involved an automobile was used to travel to the various stations, and the concentrations were observed through 7x35 binoculars. Each field trip averaged two hours of actual observation on the area. These trips were made at various times of the day, from eight o'clock in the morning to seven o'clock in the evening.

DESCRIPTION OF THE AREA

The bulk of the records were from that section of the Huron River known as Geddes Pond, since this was the chief concentration area during most of the study period. However, during the winter months the entire river between Ann Arbor and Ypsilanti was under observation. The Huron River between Ann Arbor and Ypsilanti consists of a series of impoundments connected by the more narrow natural channels of the river. The uppermost impoundment, known as Geddes Pond (stations 1, 2, 3, and 4), is a 261-acre shoal area created in 1905 by the erection of the dam at its eastern end. The western end of the pond is less than four feet deep and supports a vigorous growth of aquatic plants over a mucky bottom. It is in this upper section (station 1) that the largest concentrations were found throughout most of the seven-month period. This was due to the large area of shallow water and abundant food supply throughout the period. Diving, as well as the dabbling ducks, used this upper section in preference to the deeper lower end of the pond (station 3). That part of Geddes Pond south of the railroad tracks (station 4) was very unproductive as far as waterfowl use was concerned, although it supported a vigorous growth of aquatics. It is deeper than the upper end of the pond, but it is not as deep as station 3, so depth alone was not the controlling factor. The apparent

W. R. Crail
June 1947



HURON RIVER BETWEEN ANN ARBOR AND YPSILANTI, MICHIGAN SHOWING WATERFOWL STUDY STATIONS

avoidance of this area by waterfowl was due at least in part to the presence of many people along its shores. This area was subjected to the heaviest fishing pressure for such fish as carp, white sucker and perch, since fishermen were here as long as there was open water. The Huron River Drive, passing along the southern shore of this station, had its share of motorists as well as hikers and horsemen from the near by riding academy. The isolated section west of the Geddes Avenue bridge (station 2) is a shallow area supporting a vigorous growth of aquatics and bordered by excellent nesting cover. This area was frequented by wood ducks (in the fall) as well as coots, a few mallards and blacks.

Previous to 1925, raw sewage from the city of Ann Arbor was discharged directly into Geddes Pond, since there was no other means of disposal. However, in 1925, the Ann Arbor Sewage Disposal Plant was erected, and since then most of the city sewage has been treated before being discharged into the Huron River. Due to the fact that the Ann Arbor Sewage Disposal Plant cannot successfully treat all of the city sewage, some raw sewage is piped into the river at station 5. As far as could be determined the pollution had no adverse effect upon the waterfowl, but to the contrary, its presence in the river was conducive to their well being, directly and indirectly. The sewage itself harbored organisms, which evidently served as food, for ducks were seen feeding upon sewage drying beds along the river. Such organisms as midge

larvae, sludge worms, snails, blood worms, and certain annelids are usually associated with pollution. Ducks were seen seining the water surface with their bills as if they were feeding upon some type of organism or another. This took place just below the sewage disposal plant, and thus there is reason to believe that the treated and untreated sewage serves as a direct or indirect source of food for the waterfowl using this area. Another reason for this belief is the lack of winter food available to the waterfowl in this region. This was the concentration point for wintering waterfowl in this vicinity, and although field observations indicated that they did not leave the area to feed, the ducks evidently did not suffer from malnutrition.

The pollution had still another effect upon the waterfowl in that it tended to lower the freezing point of the water and thus was helpful in keeping the water free from ice. The treated sewage enters the Huron River at a temperature approximately 52 degrees Fahrenheit throughout the winter, and this also helps keep the river open.

Although station five is a narrow natural channel of the river, observations were made difficult by the presence of dense cover along the river bank. There is a moderately dense growth of timber on both sides of the river consisting chiefly of American elm with a scattering of basswood, box elder, and hickory. Bordering the river is

a rather dense growth of shrubs (chiefly red osier dogwood) and willows.

Just below station 5 is another impoundment in the form of a horseshoe, which is called Superior Lake (station 6). This section of the river is also polluted, but to a lesser degree than station 5. This was the concentration point for waterfowl during the month of December and again in early March. The reason for this is quite obvious. Geddes Pond was frozen over by the end of November, so the population shifted to the closest and largest body of water. This was station 6. However, by the end of December station 6 was frozen over and the population shifted to station 5 where it remained throughout the winter until the spring thaws again opened station 6. By March 12 Geddes Pond had begun to open and the ducks began to move from station 6 to station 1, which was the first part of the pond to thaw. By March 23 Geddes Pond was completely open and the concentration had gradually shifted so that by that time most of the ducks were at stations 1 and 3 of Geddes Pond, with the exception of the American mergansers. I believe that the mergansers preferred this station to the Geddes Pond area because of its greater depth.

Station 7 is a narrow natural river channel bordered on one side by a precipitous cliff. It is shallow and rocky with a rather swift current, thus it was not used to a great extent by waterfowl.

Stations 8 and 9 comprise what is called Paper-mill Lake, which is an elongated impoundment extending to the outskirts of Ypsilanti. No waterfowl were recorded here at any time during the study period. Station 8 was used for boating and fishing during the fall and spring, and for ice skating during the winter; thus many people were using the river and making it undesirable for waterfowl. The use or lack-of-use of certain areas by waterfowl often depends upon the quantity and quality of food, but since no food analysis was made during this study, the correlation between concentration areas and the waterfowl was not always fully understood. When no other factor could be attributed to the lack-of-use of an area it might easily be due to a food deficiency.

BIOLOGICAL CHARACTERISTICS OF THE AREA

The terrain adjacent to the Huron River between Ann Arbor and Ypsilanti offers a wide variety of habitats, and thus abounds with wildlife. Among the mammals present were a number of waterfowl predators; raccoon, mink, skunk and fox, as well as a few non-predacious species, such as muskrats and woodchucks. All sorts of aquatic and marsh birds inhabited the shores of the Huron, including the great blue heron, little green heron, American bittern, black-crowned night heron, and belted kingfisher. Red-winged blackbirds nested in the cattails along with swamp sparrows, northern yellow-throats, and song sparrows.

Red-tailed, red-shouldered and cooper's hawks nesting in near by woodlots patrolled the marshes in pursuit of their prey, and occasionally an osprey wandered along the river during the spring or fall. As for the fish present in this portion of the river, northern pike, wall-eyed pike, carp, bullheads, yellow perch, and common white suckers made up most of the population. Blunt-nosed minnows and golden shiners are the chief forage fishes present. There were also a few pan fishes present, such as blue-gills, pumpkin seeds, and rock bass.

COVER TYPES

There is a great diversity of cover types bordering the river between Ann Arbor and Ypsilanti. Along the northern shore of Geddes Pond the prevalent type is pasture with a scattering of woodlots. The southern shore is partly wooded with oak, elm, and maple scattered among marshy, brushy and pastured areas. The area below the Geddes dam is rather heavily wooded with elm, basswood, and hickory, with an understory of elder, dogwood, and cherry.

TOPOGRAPHY AND SOILS

The topography, as well as the cover types, varies a great deal, from level along the northern and western shore of Geddes Pond to precipitous along the southern shore at stations 5 and 7 (see map). The surrounding soils are considered rather poor.

LAND USE AND OWNERSHIP

The entire area is a state wildlife sanctuary, although there are many private and two commercial owners of the various land tracts. The New York Central System owns the railroad rights of way while the Detroit Edison Company has flow rights and also owns the land along the river shore. Most of the private owners are what might be called gentlemen farmers, since they do not raise agricultural crops although they do own livestock. For the most part, the estates are very large and much of the land is devoted to pasture and orchard.

THE FALL SEASON

INTRODUCTION

In this study, which covers a seven-month period (September 16, 1946, to April 27, 1947), approximately five miles of the Huron River was under observation. The composition of the waterfowl population was studied with reference to species, their numbers and sex, along with such incidental notes as plumage development, courtship, and general behavior. This information in itself is of no great value since it applies to a restricted area, but when the records of observers all over the country are pieced together, the result is a fairly accurate national picture of the waterfowl situation.

Banding gives even better results, but not everyone interested in waterfowl has access to or can establish a

banding station, so the next best alternative is to keep accurate field records.

MICHIGAN'S PLACE AS A WATERFOWL AREA

Michigan is not considered as being an important duck-producing state as far as breeding grounds are concerned. It lies just south of the Laurentian breeding area, which itself is not a very productive region. The species which commonly breed in Michigan are:

- black duck (*Anas fulvigula*)*
- mallard duck (*Anas platyrhynchos*)
- wood duck (*Aix sponsa*)
- blue-winged teal (*Anas discors*)
- baldpate (*Anas americana*)
- Canada goose (*Branta canadensis*)
- ring-necked duck (*Aythya collaris*)
- American merganser (*Mergus merganser*)
- red-breasted merganser (*Mergus serrator*)
- coot (*Fulica americana*)
- American golden-eye (*Bucephala clangula*)
- hooded merganser (*Mergus cucullatus*)

Being on the Mississippi and Atlantic Flyways, however, Michigan has its share of migrant ducks. Michigan has an ideal topography and physiography for migrating waterfowl in that it is flat and has an excellent distribution of water areas. It has frontage along the Great Lakes, including Lake Huron, Erie, St. Clair, Superior and Michigan,

* Scientific names of the waterfowl follow Delacour and Mayr (9).

as well as thousands of inland lakes and rivers suitable for waterfowl use. Those species which commonly migrate through Michigan are:

green-winged teal (*Anas crecca*)
gadwall (*Anas strepera*)
pintail (*Anas acuta*)
shoveller (*Anas clypeata*)
canvasback (*Aythya valisineria*)
redhead (*Aythya americana*)
lesser scaup (*Aythya affinis*)
greater scaup (*Aythya marila*)
bufflehead (*Bucephala albeola*)
whistling swan (*Cygnus columbianus*)
ruddy duck (*Oxyura jamaicensis*)
old-squaw (*Clangula hyemalis*)

All of the foregoing species have been recorded on the study area at one time or another.

THE FLYWAYS USED BY WATERFOWL

Migration of waterfowl is not a strict north-south movement, but it does follow some form or pattern. There are four flyways which form natural passageways across the country: (a) the Atlantic flyway, (b) the Mississippi flyway, (c) the Central flyway, and (d) the Pacific flyway. It would appear, from my records at least, that certain species use one flyway during the spring and another during the fall. Scaups, for instance,

were recorded sparingly in the fall, but formed the bulk of the migration during early April. Coots were abundant in the fall with as high as 33 being recorded, but only two were seen in the spring.

MOTIVATING FORCE BEHIND MIGRATION

Migration is probably the least understood of natural phenomena dealing with birds. Many theories have been advanced by ornithologists, but it is not the purpose of this paper to go into the details of this subject. Climate seems to be one factor which influences the movement of waterfowl. However, Hochbaum (14) states that "although the early autumn flights accompany north winds, weather does not influence the mass departure southward from the Delta Marsh. Come ice, snow, and strong north winds, or mild Indian summer weather, the Delta Canvas-backs always leave in body for southern waters in mid-October." My records of bird migration in general, and waterfowl migration in particular, seem to indicate that weather is not the most important factor influencing migration. To illustrate my point I have records for 1945 and 1947 on Geddes Pond (Ann Arbor) for the following species:

SPECIES	DATE OF ARRIVAL	
	1945	1947
Hooded Merganser	March 10	March 9
Baldpate	March 11	March 9
Ring-necked Duck	March 11	March 15
Whistling Swan	March 24	March 31
Bufflehead	March 25	March 30
Scaup	March 25	March 30
Ruddy Duck	March 31	March 26

The United States Weather Bureau stated that the spring season of 1945 was three weeks in advance of the 25-year average, and that the 1947 spring season was three weeks behind that average. The computation was based upon temperatures since January 1. Regardless of these facts there was a great deal of conformity between the two years as far as waterfowl was concerned. Thus it would seem that general weather conditions do not have an appreciable effect upon the mass movements of waterfowl, but these conditions certainly have at least a local effect. Thus, during the fall, you might expect an influx of migrants after a severe storm to the north. Weather also affects migration of waterfowl in that the birds usually rest during gales and snowstorms and then travel on better days, often with a good wind to their backs.

FALL MIGRATION CALENDAR

SEPTEMBER

When this study was launched on September 16, 1946, the only waterfowl present were remnants of the breeding stock for this and surrounding areas. Four to eight mallards, about 11 wood ducks, and 25 to 30 black ducks comprised the waterfowl population on Geddes Pond for the month of September. The September population consisted of all dabbling ducks.

Since most of the ducks were in their post-nuptial plumage it was difficult to identify sexes, so no sex ratio was determined for this month. During this month the black

and mallard ducks concentrated at station 1 while the wood ducks were most common at station 2.

OCTOBER

With the coming of October there was a general influx of migrants producing the peak of the fall migration on October 15, when nine species of waterfowl were recorded on Geddes Pond. The first week brought 8 baldpates, 2 scaups, 2 pintails, and 5 ring-necked ducks, and by the middle of the month one American merganser, 2 hooded mergansers, and 2 screen-winged teal were added. A pair of gadwalls came on October 20 and remained throughout the winter in areas free from ice, such as station 5 and the Ford Dam area (see map page 2). Coots were first seen during the first week of October and reached their peak on October 15 when they numbered 33. There was an influx of mallards, which also reached their peak on October 15 when 29 were seen with a sex ratio of 5 drakes to 1 hen.

The black duck, which was the most common species on the area during this month, was seen at both stations 1 and 3. It was more abundant at station 1 during the first part of the month, but during the latter part of the month it was more common at station 3. The reason for this was not determined but evidently food supply had some bearing on the matter.

Diving ducks made up only 1.07 per cent of the October population at station 1 and 1.75 per cent of the population at station 3.

NOVEMBER

The duck population dropped rapidly during the first part of the month with as few as 46 ducks being recorded on November 13. A large influx of blacks on November 24 brought the total to 189, which was the peak total population for the fall period, although only 5 species comprised this total as compared to 9 species on October 15 when the total population was 161. November 6 brought the first American golden-eyes to the area, but this species was not recorded again on the area until December 22 and from then on rather commonly throughout the winter. The black duck was the most common duck for this month, as usual, and the ring-necked duck was second. For some unknown reason the concentration of blacks shifted back to station 1. All records were from station 1 during this month. Diving ducks made up only 2.5 per cent of the November population (all records from station 1).

FALL SEASON SUMMARY

The most outstanding fact that was brought out by summarizing the fall records on Geddes Pond was the decided lack of diving ducks. The divers made up less than 2 per cent of the fall flight. This was not just a local condition, but one that prevailed throughout the state on inland lakes and rivers (18). In reviewing the hunting season of 1946, H. D. Ruhl, of the Michigan Department of Conservation, stated that there was a lack

of diving ducks on the inland lakes, but that they tended to congregate in large rafts in certain areas of the Great Lakes. The diving ducks made up less than 2 per cent of the total fall population.

As far as the state-wide waterfowl picture was concerned, most observers expressed their belief that waterfowl did not decrease much, if at all, during the past year (18).

The shorter season, "Indian summer" weather, and skyshooting novice hunters tended to decrease the 1946 duck kill in Michigan, but the North American waterfowl population for 1946 was estimated at 54,000,000 as compared to 125,000,000 in 1944. Another bad breeding season this summer might necessitate a curtailment of the 1947 hunting season.

As far as the Geddes Pond region is concerned, hunting is not allowed since it is a state wildlife refuge. However, some poaching was done, according to reports from local citizens. The only dead bird that was found was recovered at station 5 on February 12. Dr. E. C. O'Roke, of the School of Forestry and Conservation at the University of Michigan, performed the autopsy which revealed that the bird (a mallard) died from gunshot wounds.

A total of 13 species of waterfowl were recorded on the study area during the fall season. The height of the fall flight came on October 15 when 9 species were

recorded on Geddes Pond. However, the total number seen on this date was only 161, as compared to 189 seen on November 24 when only 5 species were represented. This situation resulted from an influx of black ducks which comprised 180 of the 189 ducks seen on that date.

The black duck was the most common species on the area during the fall season, with the coot second and the mallard third. These three species comprised approximately 95 per cent of the fall flight. Sex ratios were taken when it was possible to discern the sex of the duck, but because of difficulties encountered due to the plumage moults at this time of the year, no conclusions were drawn since the data were insufficient.

The following table shows the relative densities of the 13 species recorded on the area during the fall season.

TABLE 1 SHOWING RELATIVE POPULATION DENSITIES FOR THE
FALL SEASON

SPECIES	% OF TOTAL FALL POPULATION	HIGHEST NUMBER SEEN	DATE SEEN
BLACK DUCK	72.8	180	NOV. 24
COOT	12.4	33	OCT. 15
MALLARD	9.4	29	OCT. 15
BALDPATE	1.7	9	OCT. 11
WOOD DUCK	1.2	11	SEPT 16
RING-NECK DUCK	0.8	5	OCT. 5
LESSER SCAUP	---	2	OCT. 7
PINTAIL	---	2	OCT. 7*
HOODED MERGANSER	---	2	OCT. 15*
GREEN-WING TEAL	---	2	OCT 15 on
GADWALL	---	2	OCT 20 on
AMERICAN GOLDEN-EYE	---	2	NOV. 6
AMERICAN MERGANSER	---	1	OCT 15 on

* ONE RECORD ONLY

FALL SEASON TIMETABLE

SPECIES	DATE OF ARRIVAL	NUMBER SEEN	DATE LAST SEEN	NUMBER SEEN	LENGTH OF STAY (DAYS)
BLACK DUCK	SEPT 16	25	wintered	---	-----
MALLARD	SEPT 16	8	wintered	---	-----
WOOD DUCK	SEPT 16	11	OCT. 15	1	30
BALDPATE	OCT. 4	8	OCT. 15	2	12
COOT	OCT. 4	15	NOV. 18	2	46
RING-NECK	OCT. 5	5	NOV. 13	6	40 *
SCAUP	OCT. 7	2	OCT. 15	1	9 *
PINTAIL	OCT. 7	2	OCT. 7	2	1
AM. MERGANSER	OCT. 15	1	wintered	---	-----
HOOD. MERGANSER	OCT. 15	2	OCT. 15	2	1
GREEN-WING TEAL	OCT. 15	2	wintered	---	-----
GADWALL	OCT. 20	2	wintered	---	-----
AM. GOLDEN-EYE	NOV. 6	2	wintered	---	-----

* Number of days between first and last record since this species was seen only twice during the fall season.

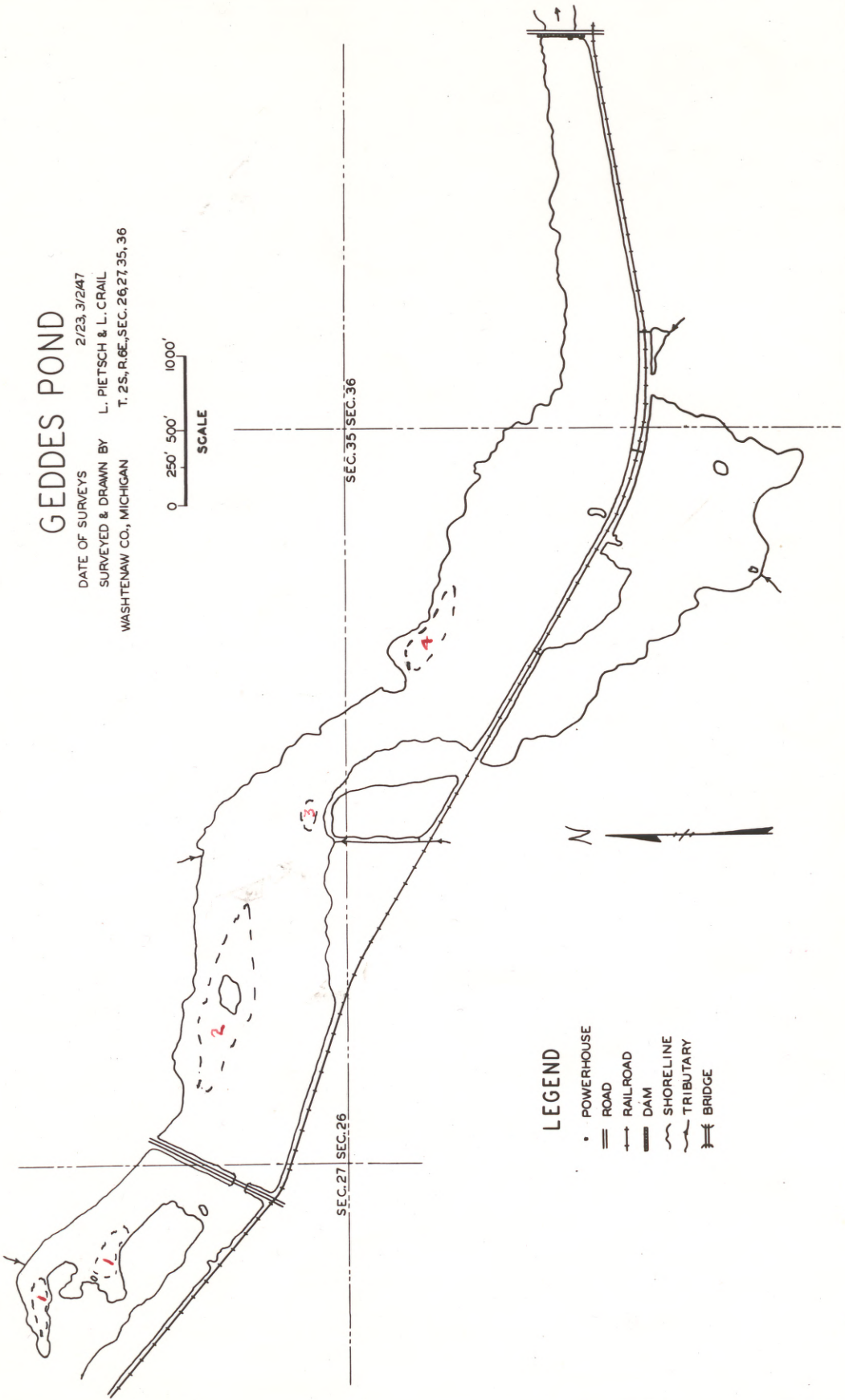
MAP SHOWING FALL CONCENTRATION AREAS

(Numbers given below correspond with those on the map on opposite page)

- 1) These two areas were used chiefly by wood ducks, and occasionally by blacks, mallards, and coots.
- 2) This was the chief concentration area for blacks, mallards, and coots. The gadwall pair were always seen here, as well as baldpates, the two pintails, the green-winged teal, and the ring-necked ducks.
- 3) The scaups were seen here as well as the American merganser.
- 4) This was the chief concentration area during the latter part of October. Large numbers of blacks and mallards were seen here as well as the green-winged teal.

GEDDES POND

DATE OF SURVEYS 2/23, 3/24/7
SURVEYED & DRAWN BY L. PIETSCH & L. CRAIL
WASHTENAW CO., MICHIGAN T. 25, R. 6E., SEC. 26, 27, 35, 36



LEGEND

- POWERHOUSE
- == ROAD
- +— RAILROAD
- DAM
- ~ SHORELINE
- ~ TRIBUTARY
- ≡ BRIDGE

FALL CONCENTRATION AREAS

see legend on opposite
page

THE WINTER SEASON

With the coming of cold winter weather in most parts of Michigan, the waterfowl migration is rapidly falling off so that by mid-December none remain except the wintering population. Although the mass migration is over, the waterfowl population is far from a static one. The ducks are constantly moving from one area to another as long as open water and food are available. Not only do the numbers vary from day to day, but also the species composition. I had often wondered where the waterfowl would go when they left station 5.

Dr. Josslyn Van Tyne, of the Museum of Zoology, told me that the Ford Dam area is used a great deal by wintering waterfowl. The Ford Dam area is a narrow natural river channel just below Ford Lake, a large impoundment of the Huron River about ten miles downstream from station 5 on the other side of Ypsilanti.

A number of field trips were made to this area in order to find any correlation between its waterfowl population and the population at station 5. I found that there was an interchange between the two populations as gadwalls were found at both stations. Since the ducks did not return to station 5 when flushed out, I believe that they flew to the Ford Dam area. The winter canvas-back and old-squaw records were from this area.

The winter season was far from a mild one, and

thus the wintering population was fairly representative of what might be expected in other years. There were ten species of waterfowl recorded on the study area during the winter period (December 1 to February 28). The following table summarizes the high lights of the wintering waterfowl population.

STATE-WIDE PICTURE OF WINTERING WATERFOWL

The ten species observed on the rather restricted area covered by this study compared favorably with other sections of the state. The Michigan Audabon Society Christmas census included these ten species of waterfowl plus seven others. The tabulated list of the waterfowl recorded appears on the following page. This list gives a fairly complete qualitative coverage of the wintering waterfowl in Michigan with the exception of the whistling swans on the Detroit River. It does not, however, give an accurate quantitative picture of the wintering waterfowl. The many small streams throughout the state undoubtedly had some waterfowl on them. Although the Audabon census listed only one canvasback there were approximately 22,000 seen on the Detroit River throughout the winter by many observers, myself included.

WINTER SEASON MONTHLY CALENDAR

DECEMBER

The third week of December brought the freeze-

TABLE 2 SHOWING RELATIVE DENSITIES AND SEX RATIOS OF
THE WINTER POPULATION

SPECIES	% OF WINTER POPULATION	DAILY DENSITY AVERAGE	DAILY DENSITY HIGH	SEX RATIO M/F
BLACK DUCK	73.0	105	304	----
MALLARD DUCK	15.2	41	70	1.54/1
AMER. GOLDEN-EYE	3.3	5	15	3.52/1*
AMER. MERGANSER	2.6	4	20	----
GADWALL	---	1	2	1/1
GREEN-WING TEAL	---	---	1	0/1
REDHEAD (1)	---	---	1	1/0
CANVASBACK (2)	---	---	1	1/0
COOT	---	---	1	----
OLD-SQUAW (3)	---	---	1	1/0

* The Golden-eye juvenile does not assume adult plumage until its second year. The ratio given is adult drakes to females and juveniles since the latter two are similar in plumage.

1 One record only

2 One record only (Ford Dam area) No other Ford Dam area records were used in the data presented

3 One record only (Ford Dam area)

	BATTLE CREEK	DETROIT	EAST LANSING	KALAMAZOO	MARNE	MONROE	MUSKOGON	THREE RIVERS	TOTALS
MUTE SWAN	-----	1							1
CANADA GOOSE	-----9							23	32
MALLARD	-----575	65					7	147	3494
BLACK DUCK	-----275	72					270		917
GADWALL	-----					8			8
BALDPATE	-----					20			20
PINTAIL	-----					100			100
GREEN-WINGED TEAL	-----					16			16
SHOVELLER	-----					1			1
REDHEAD	-----					1			1
CANVASSACK	-----						7		7
LESSER SCAUP	-----					1			1
AMERICAN GOLDEN-EYE	31	38	6	53	28	4	2900	524	3584
BUFFLE-HEAD	1								1
OLD-SQUAW	-----						6		6
HOODED Merganser	-----			17	17	6			6
AMERICAN Merganser	-----					5			5

WATERFOWL CHRISTMAS CENSUS

SUMMARY OF RESULTS OF VARIOUS AUDABON GROUPS IN MICHIGAN AS PUBLISHED
IN THE JANUARY ISSUE OF THE JACK PINE WARELER

over of Geddes Pond, but up until that time as high as 60 blacks, 1 mallard, 1 green-winged teal, and 1 gadwall were seen on the pond. From December 22 to December 29 the ducks were concentrated at station 6. On December 30, station 6 was frozen over so that the concentration shifted to station 5, the wintering area for waterfowl. Many of the local waterfowl spent part or all of the winter season at the Ford Dam area.

The December population consisted of blacks (up to 120 were seen), mallards (as high as 15), 2 gadwalls, 2 American mergansers, 1 green-winged teal, 1 American golden-eye, and 1 redhead (station 7). The peak for the month was December 22 when 133 ducks were recorded. Diving ducks comprised only 0.95 per cent of the December population.

JANUARY

All but a few scattered records were made at station 5 during this month. The mallard duck concentration rose to its highest peak with 70 birds being recorded on January 2. Other species included the black duck (as high as 140), American golden-eye (as high as 8), 2 gadwalls, 2 American mergansers, and 1 hen green-winged teal (seen through January 6). The peak for the month came on January 2 when 216 ducks were recorded, representing 6 species. Diving ducks comprised only 3 per cent of the January population.

On January 5 the Ford Dam area was visited, but since it was frozen over no ducks were present, although 10 blacks flew over the river heading west (away from station 5).

On this date the total population between Ypsilanti and Ann Arbor was 71 ducks, all of which were recorded at station 5. When the 10 blacks from the Ford Dam area were added to this total it represented a small fraction of the usual daily population of ducks using these two areas. This seems to indicate that there was a great deal of moving about during the winter months when available open water (thus available food supply)

was the chief factor limiting area-use by waterfowl. There did not seem to be any inter-specific or intra-specific conflict even when as high as 100 individuals of 4 or 5 species were huddled in an open pot-hole less than one-half acre in size. This seems unusual since the competition for food must have been severe during January and February when most of the wintering waterfowl were concentrated in a few restricted areas. To add to the confusion, 88 per cent of the wintering concentration was made up of dabbling ducks (blacks and mallards) which supposedly do not feed extensively on animal matter. However, ducks, like all animals, are opportunists and eat what is available at a given time, and thus it would seem feasible that the dabbling ducks wintering at station 5 would resort to feeding on the animal matter which was abundant there. Black ducks feed upon snails more readily than most dabbling ducks, and since 73 per cent of the wintering composition was made up of this species it is likely that the snails and other organisms present, due to the high degree of pollution, served as the main source of food. There was the possibility that the dabbling ducks left the area to feed in near by grainfields, but no evidence was secured to support this theory.

FEBRUARY

The heaviest concentrations for the entire study period were seen during this month. This was due, I believe, to an

influx of wintering black ducks from surrounding areas, possibly from the Ford Dam area. On four field trips from February 1 to February 12, the total number of ducks varied from 370 to 372 with the black duck numbering 300 for all four trips. This number of black ducks seems characteristic in that the total number of this species seen when both station 5 and the Ford Dam area were visited usually was close to 300. In the monthly computations for average number of ducks seen, the Ford Dam area population was excluded, since it was not part of the study area but only served as a check to determine the movements during winter. These movements from one wintering area to another were the chief factor in the daily variations in the total duck population. Thus daily populations have no great significance, but average monthly populations do show definite trends.

The black duck was the most common duck for this month with the mallard duck being second. As high as 300 blacks and 50 mallards were recorded on the daily field excursions, but by the third week of February the mallard concentration was falling off very rapidly, so that by the end of the month only 13 were seen. As high as 21 American mergansers and 15 American golden-eyes were recorded for the month. The pair of gadwalls were seen from time to time on the area (station 5) and also were seen at the Ford Dam area. A coot arrived on February 6

and stayed throughout the month, and perhaps it was the same coot that was later recorded at station 3 of Geddes Pond. A canvasback drake was seen on February 21 and a old-squaw drake on February 28. Both records were at the Ford Dam area. Diving ducks comprised 7.85 per cent of the total February population.

Although there were some courtship activities of the black duck during December and January, it became more intense and noticeable during February. No mallard courtship was seen, but many birds appeared to be paired by the third week of February.

SUMMARY OF THE WINTER SEASON

The black duck was the most common wintering duck on this area, comprising 73 per cent of the winter population. The mallard was second most abundant and comprised 15.2 per cent of the wintering population. As far as I could estimate, the wintering population for the area, including the Ford Dam section, was between three and five hundred ducks, but the daily variation was so great that no accurate statement could be made. Station 5 and the Ford Dam area were the chief concentration points for wintering waterfowl in this vicinity. There were ten species of waterfowl that spent part of all of the winter on the study area. See table 2 for the list of species and their relative abundance.

Sex ratios were determined whenever possible, but

conclusive information was obtained only on the mallard duck which had a ratio of 1.54 males to 1.0 female. It is, of course, impossible to determine the sex of black ducks by field observation only, so no sex ratio was worked out for this species. It is impossible to distinguish juvenile American mergansers and American golden-eyes from adult females during this time of the year, so no sex ratio was obtained for these two species. However, a ratio of adult drakes to juveniles and females was worked out for the golden-eye in order to convey the distorted status of this species on the area. This ratio was 3.52 adult drakes to 1.0 females and juveniles. Just what does such a ratio mean? If all of the juveniles were females the ratio would be 3.52 males to 1.0 females; this being a rather distorted ratio. But if some of the juveniles were males the ratio would be even more distorted. More discussion about the sex ratio of this species will be given in the species account.

Courtship activity was noted during December, January, and February for the black duck, but none of the other species showed any signs of sexual awareness.

Some of the blacks and mallards appeared to be paired as early as the first week of January, although this is not a certainty. The criteria used was the constant association of a drake and a hen with the exclusion of all others. No attempts, on the part of the drake,

were made to repel other drakes of its species during the winter period.

The only evidence of mortality during the winter period was a drake mallard found dead on February 12 with gunshot wounds. Reports from local citizens seem to indicate that there was some poaching done throughout the winter at station 5 where the waterfowl could easily be approached with an automobile.

It is impossible to say just how many of the mallards came from domestic stock, but I believe the four mallards seen at station 8 were domesticated. They were always seen at this station even after it was frozen over, and they were easily approached although they could and did take to the air.

THE SPRING SEASON

Long before the coming of the first warm breezes of spring, V-shaped flocks of geese are seen winging across the horizon. On clear moonlight nights in late February and early March you can hear their distant "honking" as the procession moves onward.

Thus, though icy winds make their journey longer, the winged harbingers of spring, the ducks, geese and swans brave the snow and bitter cold to travel to their northern breeding grounds. What prompts them to leave the warm climate of the wintering areas, where food usually abounds, to initiate the northward journey?

Perhaps it is the urge to breed that drives them onward like so many salmon fighting the torrents of a mountain stream. Whatever the cause, they rise from the swamps and bayous of Louisiana, the tidal marshes of the Atlantic, and the inland lakes of Mexico and swing northward following the flyway routes that experience has taught them to use.

This is the season of greatest activity among the waterfowl. Besides the long trip to the breeding grounds, courtship must be enacted, pairs formed, and finally when the journey is over the nesting duties begin. At this time of the year the ducks are in their nuptial plumage, and thus the determination of sex ratios is made easier than during the fall.

SPRING SEASON MONTHLY CALENDAR

MARCH

By the second week of March station 6 had opened up sufficiently enough to support a large number of ducks, and thus became the concentration point through March 22. Geddes Pond started to open up also during the second week of March, and although it supported a duck population at this time it did not become the chief concentration area until March 24. Hooded mergansers and baldpates arrived on March 12, 2 scaups, a ring-necked duck, and a green-winged teal were added on March 15. The last week of March

brought shovellers, ruddy ducks, buffleheads, blue-winged teals, redbreasted mergansers, whistling swans (100), and a wood duck. The peak for the month and also for the spring season came on March 31 when 421 ducks were seen.

A discussion of the effects of weather upon waterfowl migration has already been discussed, so no further comments will be made here on this subject. However, the weather did affect the distribution of the concentrations on the study area. The primary affect was that of ice formation on the river. During the first three weeks of March the waterfowl were concentrated at stations 5 and 6 with only a few scattered records at stations 1 and 3. Station 1 was the first to open up, and as soon as there were a few pot-holes available ducks used them. The pot-holes became enlarged and connected with each other to form long strips through the station extending to station 3. When station 3 opened up it supported a slightly higher population through March than did station 1, but this did not hold true for the month of April when the population at station 1 was nearly twice as high as that at station 3.

Weather exerts another effect upon waterfowl distribution by means of strong winds. On days when the wind was strong enough to create choppy waters, the ducks usually sought cover on the leeward side of the island at station 1 or in the coves at station 3. Such conditions were temporary and did not have an overall effect

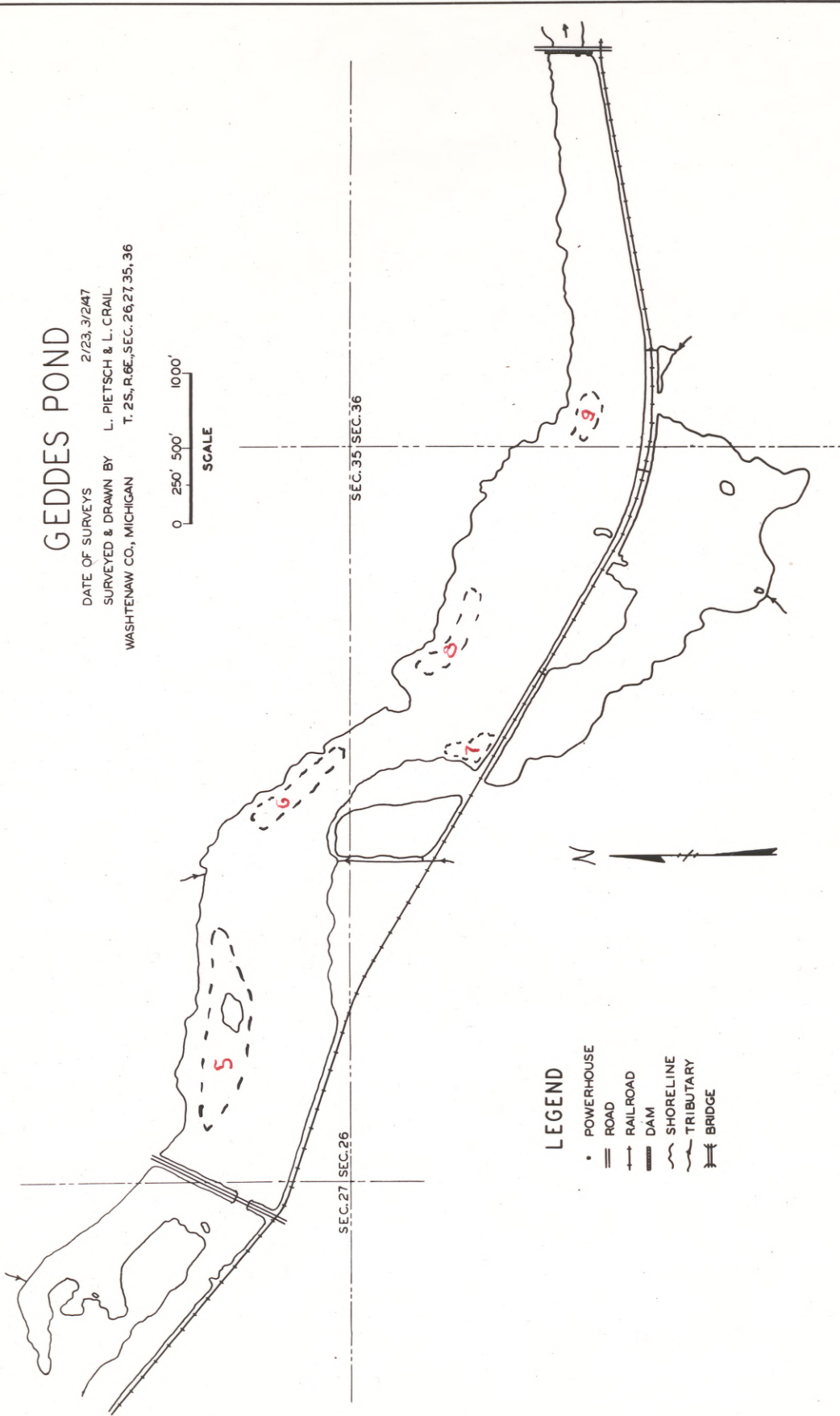
MAP SHOWING SPRING CONCENTRATION AREAS
(MARCH)

(The numbers given below correspond with those on the map on the opposite page.)

- 5) This area was used chiefly by blacks, ring-necks, American mergansers, baldpates and scaup. Redheads, canvasbacks, shovellers, and red-breasted mergansers were seen here in small numbers from time to time.
- 6) This was the courting area for the American golden-eye. Hooded and American mergansers, scaup, bufflehead and ring-necks were also seen here.
- 7) This little cove offered an excellent resting spot for shovellers, gadwalls, baldpate, scaup, and black ducks. The cove had its "territory" here in the cat-tails.
- 8) Blacks, American mergansers, American golden-eyes, and ruddy ducks were commonly seen here. Scaup, baldpate, and green-winged teal were seen here in small numbers.
- 9) Canvasbacks, redheads, and ring-necks were seen here a great deal during their brief stay.

GEDDES POND

DATE OF SURVEYS 2/23, 3/2/47
SURVEYED & DRAWN BY L. PIETSCH & L. CRAIL
WASHTENAW CO., MICHIGAN T. 2S., R. 6E., SEC. 26, 27, 35, 36



LEGEND

- POWERHOUSE
- == ROAD
- + RAILROAD
- DAM
- ~ SHORELINE
- ~ TRIBUTARY
- ≡ BRIDGE

see legend on opposite page
SPRING CONCENTRATION AREAS
MARCH

upon the distribution of the waterfowl on the area.

Courtship of the American golden-eye, American merganser, and the black duck reached its peak during this month.

Diving ducks comprised 75 per cent of the population at station 1 and 80 per cent of the population at station 3. These percentages show the drastic change in the waterfowl composition from fall to spring. In the fall diving ducks made up only 2 per cent of the total population.

The black duck was the most common species on the area up until March 24 and then the American merganser took over temporarily. From March 30 to the end of the study period on April 27 the lesser scaup was the most common species on the area.

The ring-necked duck, scaup, and golden-eye averaged 16.8, 16.5, and 16.2 birds per field trip respectively, and thus ranked third, fourth, and fifth for the month of March. The mallard was not recorded on the area after March 24, but pairs have been flushed from near by farm potholes, indicating possible nesting records.

APRIL

The peak of the spring migration carried over into the first week of April when 327 ducks were seen, comprising 16 species on April 4. The population dropped rapidly from 191 on the seventh to 81 on the ninth and then became

progressively smaller throughout the month with only 30 ducks being recorded on April 27.

Two new species were added during the early part of the month. Fifteen Canada geese were seen flying over Geddes Pond on April 4 and a greater scaup was added on April 12.

The waterfowl concentrations were the heaviest at stations 1 and 3 during this month with about twice as many ducks using the former.

Diving ducks made up 91 per cent of the population at station 1 and 87.5 per cent of the population at station 3. This unusually high percentage was due to the large number of scaups which comprised 56.5 per cent of the April population. The American merganser was the next most common species on the area during April, but this species was greatly reduced in numbers by the end of the month, having dropped from 64 on April 4 to four on April 27. Stations 2 and 4 opened up during the early part of the month and supported a small waterfowl population, chiefly of black ducks and American mergansers.

Courtship was at a minimum during April. The only courtship record was for the ruddy duck. Most of the other species seemed to be paired by this time. However, copulation of the lesser scaup was observed on April 23. The description of this act will be given in the species account under lesser scaup.

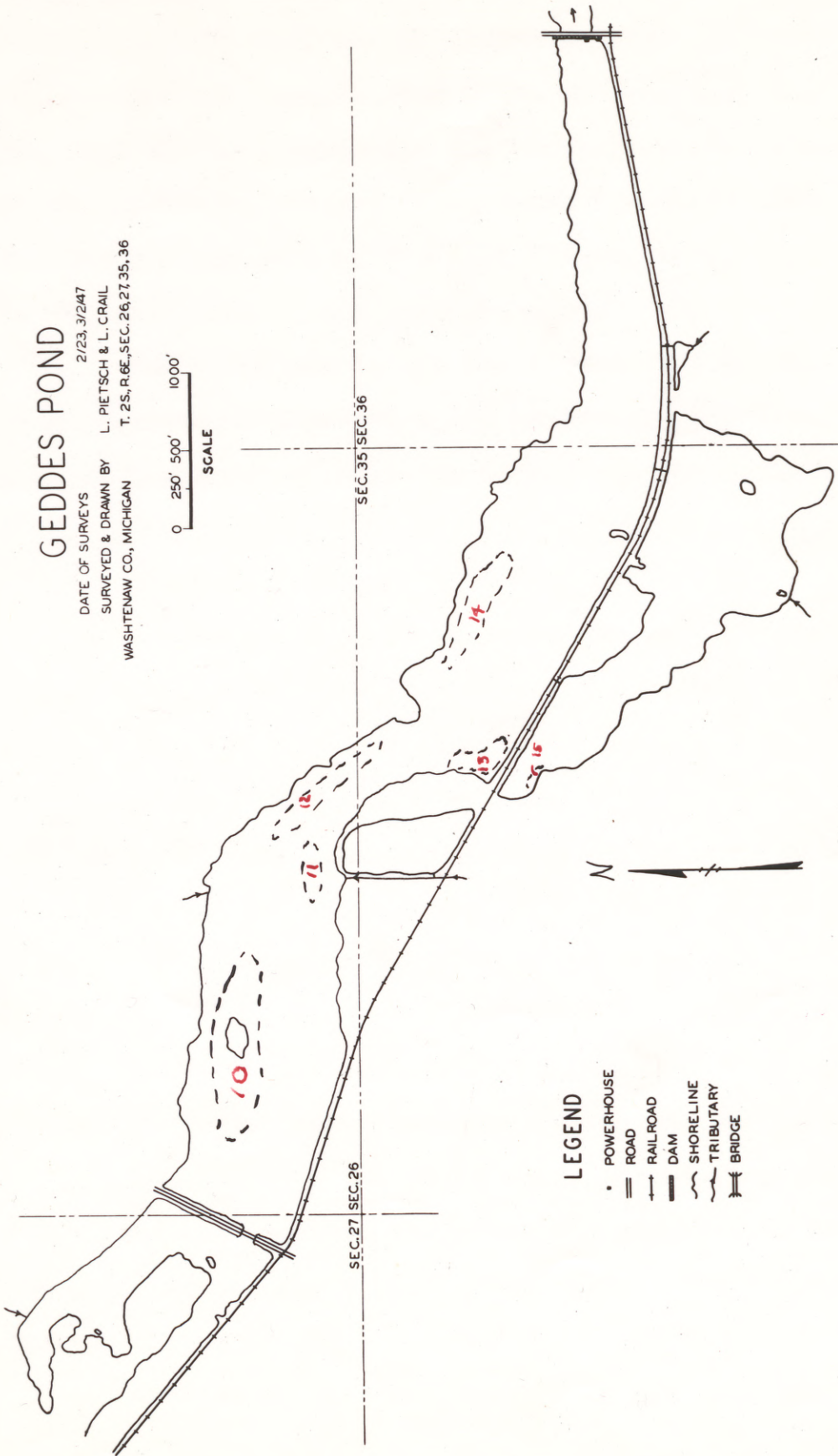
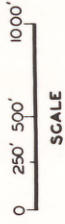
MAP SHOWING SPRING CONCENTRATION AREAS
(APRIL)

(Those numbers given below correspond with those on the map on the opposite page.)

- 10) This was the chief concentration area for scaups and ring-necks during this month. Baldpates and shovellers were also seen here as well as occasional records of blacks and American mergansers.
- 11) Scaups and ring-necks were usually seen here.
- 12) Scaups were common here during April with a few ring-necks, American and redbreasted mergansers, and the blue-winged teal.
13. Baldpates, scaup, and the coot used this sheltered spot as well as a few American mergansers.
14. Scaups, American and redbreasted mergansers, blacks, and baldpates were seen here. The ruddy duck was seen here on nearly all occasions.

GEDDES POND

DATE OF SURVEYS 2/23, 3/2/47
 SURVEYED & DRAWN BY L. PIETSCH & L. CRAIL
 WASHTEENAW CO., MICHIGAN T. 25., R. 6E., SEC. 26, 27, 35, 36



LEGEND

- POWERHOUSE
- == ROAD
- RAILROAD
- DAM
- ~ SHORELINE
- ~ TRIBUTARY
- ≡ BRIDGE

SUMMARY OF THE SPRING SEASON

The most outstanding difference between the fall and spring flights was the percentage composition of diving ducks. Divers (mergansers included) made up less than 2 per cent of the fall flight, while making up 66.5 per cent of the spring flight.

The March population was distributed fairly evenly between stations 1 and 3 except for the early part of the month when station 6 was the concentration area. During April station 1 was used by twice as many waterfowl as station 3.

Twenty-two species of waterfowl were recorded on the area during the spring season. The peak of migration came on March 31 when 421 ducks were recorded, representing 15 species. The black duck was replaced by the American merganser for a short time as the most common species on the area, and then the influx of lesser scaups placed this species on top from March 30 to the end of the study period.

Table 3 shows the relative abundance and sex ratios of the waterfowl recorded during the spring season.

Courtship of the black duck, golden-eye, scaup, ruddy, and the American merganser was observed to be intense during the early part of the season and gradually falling off by April.

Copulation of the lesser scaup was observed on April 23.

Analysis of the sex ratios show a preponderance of males of all species except the canvasback and the shoveller. The golden-eye sex ratio was highly distorted with 4.5 males to 1.0 females. A sex ratio for the golden-eye was impossible to obtain during the fall and winter since the juveniles resemble the adult hens at this time, but by spring the males can be detected by the presence of a diffused white patch at the base of the bill.

No sex ratios were given when data was insufficient to show conclusive results.

SPECIES ACCOUNT

The purpose of the species account is to gather all the pertinent facts concerning each species of waterfowl and present this information in discussion form so that the true status of this species on the area is understood. Material gathered from the literature will be incorporated when such information helps to interpret field data.

WHISTLING SWAN

The whistling swan wintered in small numbers at Grosse Isle on the Detroit River here in Michigan, but was not seen on the study area until March 31 when about 100 flew over Geddes Pond. On April 4, 17 swans were seen at station 1. Twelve of these swans were immatures since they had dusky plumages and their bills were not as black as the others.

TABLE 3 SHOWING RELATIVE ABUNDANCE, PERCENTAGE COMPOSITION, AND SEX RATIOS OF THE SPRING WATERFOWL POPULATION

SPECIES	% OF SPRING POPULATION	DAILY DENSITY		SEX RATIO
		AVERAGE	HIGH	
BLACK DUCK	27.8	40	190	-----
LESSER SCAUP	23.0	33	159	2.4/1
AMER. MERGANSER	21.5	31	88	-----
RING-NECK DUCK	6.5	10	77	4.0/1
GOLDEN-EYE	6.0	9	40	4.5/1
WHISTLING SWAN ¹	3.8	6	100	-----
MALLARD	2.6	4	20	1.5/1
RUDDY DUCK	2.0	3	11	1.0/1
HOODED MERGANSER	1.8	3	9	-----
BALDPATE	1.2	2	9	3.6/1
CANVASBACK	0.9	1	8	1.0/1.7
RED-BREASTED "	0.8	1	5	-----
SHOVELLER	0.7	1	5	1.0/1.4
CANADA GOOSE ²	0.5	1	15	-----
REDHEAD	0.4	1	3	2.2/1
WOOD DUCK	---	---	3	Too
BUFFLEHEAD	---	---	4	few
BLUE-WING TEAL ¹	---	---	2	records
GADWALL	---	---	2	to
COOT	---	---	2	determine
GREATER SCAUP	---	---	2	a sex
GREEN-WING TEAL	---	---	1	ratio

1) Two records only

2) One record only

SPRING SEASON TIMETABLE

SPECIES	DATE OF ARRIVAL	NUMBER SEEN	DATE LAST SEEN	NUMBER SEEN	LENGTH OF STAY (DAYS)
BLACK DUCK	wintered	--	APRIL 27	6	breeds locally
MALLARD	wintered	--	MARCH 24	2	breeds locally
AM. Merganser	wintered	--	APRIL 27	4	---
GADWALL	wintered	--	MARCH 30	2	---
AM. Golden-eye	wintered	--	APRIL 4	5	---
COOT	wintered	--	APRIL 19	2	---
HOOD. Merganser	MARCH 12	2	APRIL 23	1	43
BALDPATE	MARCH 12	4	APRIL 23	1	43
LESSER SCAUP	MARCH 15	2	APRIL 27	19	44 *
GREEN-WING TEAL	MARCH 15	1	MARCH 27	1	13
RING-NECK DUCK	MARCH 15	1	APRIL 13	2	30
SHOVELLER	MARCH 23	2	APRIL 4	2	13
CANVASBACK	MARCH 23	1	APRIL 4	2	13
REDHEAD	MARCH 24	1	APRIL 19	3	27
RUDDY DUCK	MARCH 26	2	APRIL 19	4	25
BUFFLEHEAD	MARCH 30	4	APRIL 7	2	9
R-B. Merganser	MARCH 30	3	APRIL 27	1	29 *
BLUE-WING TEAL	MARCH 30	2	APRIL 9	1	11
WHISTLING SWAN	MARCH 31	100	APRIL 4	17	5
WOOD DUCK	MARCH 31	1	APRIL 23	3	breeds locally
CANADA GOOSE	APRIL 4	15	APRIL 4	15	1
GREATER SCAUP	APRIL 12	1	APRIL 14	2	3

* Species still on area after the study period was terminated, thus number of days would be higher.

CANADA GOOSE

The only record for this species on the study area was on April 4 when a flock of 15 birds flew over Geddes Pond.

MALLARD

The mallard breeds locally and was on the study area when the study was initiated on September 16, 1946. The flock consisted chiefly of drakes that had just completed their eclipse moult and which were in various stages of the prenuptial moult. Some of the drakes were in complete nuptial plumage as far as the eye could detect, while others were just coming out of the eclipse. By mid-October nearly all of the drakes were in complete nuptial plumage.

There was an influx of mallards in October with as high as 29 being recorded at stations 1 and 3. The population dropped in November and December as the fall migration came to a close. The mallard population reached its peak during January when as high as 70 were recorded. This was due to an influx of wintering mallards from surrounding localities.

The mallard population fell off rapidly during February so that by March 9 only 14 were seen at station 6. On March 24 only 2 were recorded and this was the last record for the mallard on the study area.

The mallard made up 9.4 per cent of the fall flight,

15.2 per cent of the winter population, and only 2.6 per cent of the spring population. There was no influx of mallards during the spring, which seems to indicate that the main spring flight of this species misses southeastern Michigan.

The sex ratio was nearly constant during the winter and spring, being 1.54/1 in the winter and 1.50/1 during the spring.

Only those mallards seen at station 8 were definitely classified as of domestic origin, but possible others were from domestic stock also.

No courtship was observed at any time during the study period.

BLACK DUCK

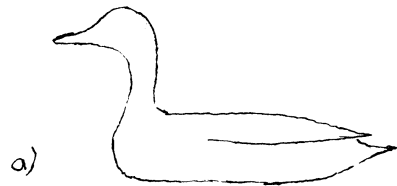
The black duck was the most abundant species on the area during all seasons, comprising 72.8 per cent of the fall flight, 73.0 per cent of the winter population, and 27.8 per cent of the spring population. When the study was initiated remnants of the local breeding stock were the only ducks on the area, but the fall migration produced an influx in October and again in November. The height of fall migration was on November 24 when 180 blacks were recorded. The December population was a variable one with as few as 8 and as high as 120 blacks being recorded on the daily field trips. This was due to the variation in the amount of open water on the Huron

River. Alternate cold and warm spells changed the composition of the water areas so that one day a certain section of the river would be open and the next day it would be frozen over, the only consistency being that the greater the amount of open water the greater the dispersal of waterfowl.

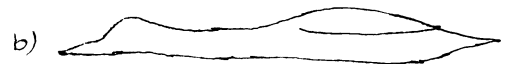
This moving from one winter area to another produced great fluctuations in the daily population. Such was the case during the first two weeks of February when the population jumped from 150 blacks to 300. The population then dropped back to around 150 ducks until the fourth week of March, at which time it began to drop steadily. By April 7 only 5 or 6 black ducks remained on the area and these were seen throughout the duration of the month. Possibly they represent the breeding population in the vicinity.

Courtship of the black duck was noted in December, January, February, and early March, and was the most intense during the latter part of February and early March. There were a number of characteristic postures assumed by the black duck during the courtship performance. A description of these positions follow.

a) A common display, the neck-stretch, simulates the neck-stretch position of the canvasback as described by Hochbaum (11) except that the black duck does not tilt its bill upward, but holds it in the normal position. The head was held as high as the neck would permit momentarily and then it was lowered into the water in preparation for the sneak display which invariably followed.



b) In this display the head and neck were extended forward in the water while the bird rushed toward a hen, oftentimes biting at her tail feathers as he did so.

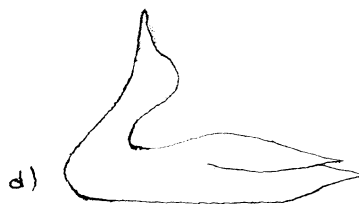


c) A third posture, the tail-thrust, often preceded the sneak position. In this display the body was dipped forward and the tail snapped rigidly upward.

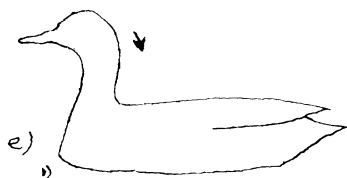
d) A fourth display noted was the zenith position, which simulates the "head throw" position of the canvasback except that the head was not thrown as far back. In this position the



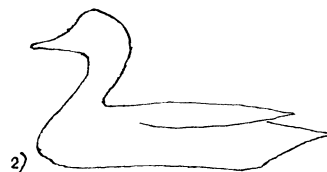
bill was pointed to the zenith and then the head was thrown forward with a jerk.



e) Bobbing the head in a vertical and slightly horizontal plane was noted to be a rather common courtship display. The head was raised on the extended neck, as in the neck-stretch, and then lowered quickly to its normal position.



f) One of the most common performances was the plumage display, in which the duck upon rising partially out of the water flaps its wings while apparently displaying its entire plumage.



GADWALL

A pair of gadwalls were first seen on Geddes Pond (station 1) October 20, and were recorded from time to time until March 30. When first seen they were in their pre-nuptial plumage, which gave them a grey, mottled appearance similar to the hen mallard. However, the gadwalls are more graceful looking and possess a

white patch in the speculum of the wing, which can be detected both in flight and when the duck is on the water. By the first part of December the drake was in full nuptial plumage. The female continues the pre-nuptial moult through the winter and early spring. The gadwalls wintered at station 5 and the Ford Dam area, and were recorded at station 3 during the spring. In the spring they were seen invariably with a pair of baldpates and even flushed and flew off with them.

BALDPATE

The first baldpates came to Geddes pond on October 4 and the last fall record was for October 15. Since they were in their pre-nuptial plumage, the drakes were lacking the white pate, making it difficult to distinguish sexes. The baldpate did not winter on the area although it was recorded at Grosse Isle in the Detroit River throughout the winter.

Living up to its reputation as an early migrant, the baldpate was the first spring arrival along with the hooded merganser on March 12. The spring population varied from day to day with the peak being on April 4 when 9 were seen. The baldpate made up 1.7 per cent of the fall population and 1.2 per cent of the spring population with a sex ratio of 3.6/1.0.

In the fall the baldpates were recorded only at station 1 where they were usually seen dipping in the shallow water near the island. In the spring they were

recorded at stations 1, 3, 6, and 7, although they were seen most often at stations 1 and 3.

PINTAIL

Supposedly an abundant duck, the pintail was recorded only once on the study area, and that was on October 6 when a drake and a hen were seen in pre-nuptial plumage. Being a gregarious species, the pintail is often seen by the thousands on the Great Lakes and the larger inland lakes in this vicinity. It is especially common in the central prairie region where at times it is a menace to agricultural crops. Large flocks of mallards and pintails feeding in grain fields can cause a great deal of damage. Perhaps the presence of the Great Lakes in the immediate vicinity cause the pintail to slight the Huron River in preference to these larger bodies of water.

GREEN-WINGED TEAL

Two green-winged teal were first seen on the area on October 15. One was a female and the other might have been a drake in the pre-nuptial plumage, or possibly also a female, but the distances involved made positive identification difficult. They were seen again on October 22, and from then on through January 6 only the hen remained. Records of this species were not obtained every day through this period, but I believe it was either at station 5 or some other winter concentration area in this vicinity. When a flock of 150 to 200 ducks flushes from the river

it is easy to overlook a little green-winged teal. However, it was not seen after January 6 again until March 15 when a hen (possibly the same hen) was recorded at station 5. Perhaps this bird had spent the remainder of the winter just south of the study area since it was absent for such a short time.

The green-winged teal was recorded at stations 1 and 3 during the fall, stations 5 and 6 during the winter, and stations 3, 5, and 6 during the spring.

Following the typical form of the spring migration, the green-wing spent little time on the area before heading north to its breeding grounds. The last date for this species was March 27, just 12 days after its first appearance.

BLUE-WINGED TEAL

This species was recorded only during the spring and on only two occasions. Two drakes were seen on March 30, and one drake was recorded on April 9.

SHOVELLER

Being a late spring migrant, the shoveller was recorded on the area for the first time on March 23. This was one species that had more females than males on the area. If such a sex ratio (1.0/1.4) existed generally in nature with this species, some complications would surely result as the hen shoveller is known to be polyandrous. The shoveller and mallard hens are the only ones known to have this habit. (14)

The first shovellers (a drake and a hen) were seen

at station 1 on March 23. These were joined by two additional hens on March 26, and another drake on March 30. The number dropped to 2 drakes on April 4, and the species was not recorded after that date. The shoveller was seen at both stations 1 and 3, but showed a slight preference for station 3. This species comprised 0.72 per cent of the spring flight on the area.

WOOD DUCK

The wood duck breeds locally and was on the area when this study was initiated on September 16. Most of the birds were drakes that had recently come out of the eclipse plumage and which were in various stages of the pre-nuptial moult. Although some of the drakes were in full nuptial plumage there were many just coming out of the eclipse plumage, which closely resembles that of the hen, and thus no accurate sex ratio could be worked out from field observations alone.

This species, which comprised 1.2 per cent of the fall population, was seen at both stations 1 and 2. However, it was more common, by far, at the latter station. It was the most abundant on September 16 when 11 birds were seen, but the population slowly fell off so that by October 15, when it was last seen, only 1 wood duck remained. In the spring the wood duck was recorded only twice; once at station 1, and again when 3 birds flew over this station.

REDHEAD

The redhead was first recorded on the area December 25 at station 7, and was not seen again until March 24. Both of these records were single drakes. This species was seen regularly from March 24 to April 19 with as high as 3 birds being seen on one day. The sex ratio (including the one winter record) was 2.5/1.0.

During the spring the redhead population (which made up only 0.42 per cent of the spring total) was distributed in equal numbers between stations 1 and 3 in association with ring-necks and canvasbacks.

Although it was recorded only once on the study area during the winter season, the redhead was a rather common winter resident at Grosse Isle on the Detroit River where it was present in association with the large rafts of canvasbacks.

RING-NECKED DUCK

The ring-necked duck was first recorded on the area October 5 when 2 drakes and 3 hens were seen at station 1 of Geddes Pond. Although the drakes were not in complete nuptial plumage, they were far enough advanced to distinguish them from the hens. The ring-neck was recorded again on November 13 when 6 birds were seen at station 1 along with black ducks and 2 gadwalls. These two widely separated records indicate that the fall flight is a leisurely one in which the ducks rest a great deal on the southward journey, in contrast to the spring flight which is more direct.

In the spring the first ring-neck was seen on March 15 at station 6, and from then until March 30, when 74 were recorded, the population increased steadily. During the first week of April the ring-neck population dropped rapidly so that only a few birds were recorded at a time until April 13 when the ring-neck was recorded for the last time on the area.

During the spring station 3 supported approximately twice the number of ring-necks as did station 1, although they were recorded more often (in smaller numbers) at station 1.

The ring-necked duck comprised 6.5 per cent of the spring population and 0.84 per cent of the fall population.

CANVASBACK

Although probably the most common duck on the Detroit River during the winter, the canvasback was recorded only once on the study area during this (winter) period. On February 21 a drake was recorded at the Ford Dam area in association with blacks, mallards, golden-eyes, and American mergansers. The first spring record was March 23 when a hen was recorded at station 3 of Geddes Pond. Canvasbacks were recorded until April 4 with the peak of migration coming on March 31 when 15 were seen.

The canvasbacks were recorded at stations 1 and 3 during the spring with station 3 being used more often.

The canvasback population, which made up 0.89 per cent of the spring flight, showed a preponderance of hens, the sex ratio being 1.0/1.7 (drakes to hens).

GREATER SCAUP

It is difficult to distinguish greater from lesser scaups unless conditions are favorable. When the distances involved were great, no attempts were made to differentiate the two, but during this study several excellent opportunities arose which made possible a close examination of these two ducks. Keeping a vigilant watch in order to find greater scaups among the lessers, I met with little success until April 12 when 5 scaups were seen at close range (within 30 yards). One was definitely a greater scaup drake. There was a great deal of intergration as far as color pattern was concerned. Some of the lesser scaups appeared more white than others, and thus resembled the greater in that respect. However, there was no intergration (in these five birds) as far as size was concerned; the greater scaup was larger all around and had a much wider bill. A greater scaup drake was seen on April 13 and a drake and a hen were recorded on April 14. Although scaups were still recorded on the area through April, none that could be definitely ascertained as greater were seen.

LESSER SCAUP

Lesser scaups were recorded on the area on October 7 (2 drakes) and again on October 15 (1 drake)

during the fall. Although not recorded on the area during the winter, the lesser scaup is a fairly common winter duck, especially on larger bodies of water. It was recorded at Grosse Isle, on the Detroit River, throughout the winter in large numbers. On January 15, 1946, I visited this spot and estimated that there were around 400 to 500 lesser scaups present.

March 15 was the first spring record for the lesser scaup, at which time 2 drakes were recorded at station 1 of Geddes Pond. The population increased by leaps and bounds so that by March 31 it stood at 77, and on April 4 it reached the peak with 159 scaups being recorded at both stations 1 and 3. The population dropped slightly to 132 on April 7 and then sharply to 37 on April 9. From then on the population slowly dropped so that by the end of the study period on April 27 there were only 19 scaups remaining on the area. The lesser scaup is the last migrant duck to leave the area. There were still a half-dozen lesser scaups on Geddes Pond as late as May 21 in 1945.

The lesser scaup made up 23.0 per cent of the spring flight and was the most common duck on the area for the month of April. The spring sex ratio for this species was 2.4/1.0. Station 1 supported approximately 79 per cent of the spring population of lesser scaups with station 3 producing the remainder.

Courtship of the lesser scaup was observed during the latter part of March and early April. The only courtship activity that I had the good fortune to observe was the diving display. One courting party consisted of 2 or 3 hens and about a dozen drakes. They were swimming quietly on the water when one of their number dove and was quickly followed by others. Soon the whole group was diving in an excited manner. When a drake would come up from a dive he immediately looked around for a hen, and if none were in sight he would dive again. Each bird in the courting party was diving from eight to ten times per minute while a group of non-participant scaups nearby were not diving at all.

On April 23, a small group of scaups were feeding near the island at station 1 when suddenly a drake and a hen swam off together rather rapidly. Just as sudden as the departure, the hen sank into the water, her neck outstretched so that only the top of her head broke the water surface. The drake mounted her quickly, completely submerging her as he did so, and copulation took place. The act, which lasted from 6 to 8 seconds, was rather vigorous and involved much splashing. No courtship displays were given before copulation, and after it was over the hen rose partly out of water and flapped her wings and then the pair swam off together.

AMERICAN GOLDEN-EYE

The golden-eye was recorded only once during the fall season and that was on November 6. It was recorded next on December 22 at station 6, and from then on through the winter it was recorded in small numbers (up to 15).

During the last week of March the golden-eye population started to increase rapidly from 23 on March 26 to 34 on March 30, and then to 40 on March 31. If the population increased rapidly, then it decreased twice as rapidly, for by April 4, when it was last seen, the golden-eye numbered only 5 birds.

Comprising 5.8 per cent of the spring population, the golden-eye was seen at stations 1, 3, and 6 during this season, the latter station being used in early March before Geddes Pond had opened up.

The golden-eye does not mature in one year, and since the juveniles resemble adult females during their first fall and winter, no sex ratio was worked out. By spring, however, the juvenile drakes can be distinguished by the presence of a diffused white patch near the base of the bill, and thus a sex ratio can be determined. This ratio on the study area was 4.5/1.0, as compared to the winter ratio of 3.52 adult drakes to 1.0 juveniles and adult hens. Since these two ratios were not obtained from a stable population, no conclusions can be drawn from them.

Courtship of the golden-eye was first observed on March 12 and it increased in intensity throughout the month. On March 24, when courtship seemed to be at its peak, a number of characteristic display postures were noted. A description of these follows.

One of the most common display postures noted was the one in which the bird snapped its head back so that the occiput touched the bird's back.

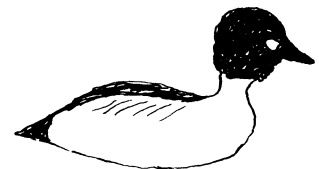


When it came out of the position just described, the golden-eye did so with a vigorous snap which carried the bird forward in the water while the feet were thrust backward. This backward thrust created a large splash and also displayed the brightly colored feet of the drake.



This performance was also done from the normal sitting position.

Another display posture noted was the neck-stretch, in which the head is raised vertically to the full extent of the bird's neck and then snapped back to its normal position.



A position similar to the neck-stretch but in which the head, instead of being raised vertically, was thrust slightly forward as the bird uttered a nasal "pee-yah". This call was strikingly similar to that of a distant nighthawk.



BUFFLE-HEAD

The buffle-head was recorded for the first time on March 30 when 3 drakes and a hen were seen at station 1. It was seen in small numbers ranging from 1 to 5 until April 7.

OLD-SQUAW

This species was not recorded on the study area proper but at the Ford Dam area on February 28, when a drake in winter plumage was seen.

HOODED MERGANSER

Hooded mergansers were recorded once (October 15) during the fall and regularly during the spring from March 12 to April 23. Usually seen in small numbers (up to 9), the hooded mergansers made up 1.8 per cent of the spring population. The population which consisted chiefly of paired birds was distributed among stations 1, 2, 3, 5 and 6, although it was highest at stations 1 and 3.

No sex ratio could be worked out since mergansers do not mature in one year and the juveniles cannot be distinguished from the adult hens.

AMERICAN MERGANSER

The American merganser was first recorded on the study area on October 15 and remained throughout the study period. This is the common "winter duck" of Michigan, although it made up only 2.6 per cent of the winter population on the study area. It was recorded throughout the winter period in rather small numbers (up to 15), but during the latter part of March there was a general influx producing the peak on March 24 when 88 American mergansers were recorded. The population fell off rapidly during the first part of April, so that by the end of the month only a few birds remained on the area.

The American merganser population, which made up 21.5 per cent of the spring total, was distributed throughout stations 1, 2, 3, 4, 5, 6, and 7.

Courtship of this species consisted of various types of water maneuvers in which the drakes swam around the hens like so many motorboats. They would rush through the water creating quite a splash, then swim placidly for a while before darting again in pursuit of some hen.

RED-BREASTED MERGANSER

This species was first recorded on the area March 30 when 3 drakes were seen at station 1. It was

recorded at stations 1 and 3 in small numbers (up to 5) throughout the duration of the study period, and being the latest spring migrant of the merganser tribe, the red-breasted merganser was seen on the area in May.

RUDDY DUCK

The ruddy duck was first recorded on the area on March 26, although Mr. Lysle R. Pietsch, a student at the University of Michigan, had seen it several days prior to this date at station 3.

The ruddy duck has the distinction of being the only species (seen in large numbers) with an even 1/1 sex ratio.

All except one record for this species were from a fairly restricted area of station 3. (See spring concentration area map on page). The ruddy duck made up 2.0 per cent of the spring population.

This species does not follow the usual plumage pattern characteristic of other ducks, but has a winter and a summer plumage. In March and April it is undergoing its pre-nuptial moult which produces the summer plumage. (14) Thus on April 7, and several later dates, there were 2 drakes which were not in full nuptial plumage, while all other drakes seen had already assumed their nuptial garb. In the early stages of the pre-nuptial moult the drake resembles the hen except for its larger size.

Courtship of the ruddy duck was observed only once, and that was on April 9 when a drake was seen to

throw its head forward while erecting its tail so that it came high over the duck's back. This performance was repeated several times but no other courtship postures were assumed.

COOT

The coot is not a member of the family Anatidae as are all the other species covered in this report. It is considered with waterfowl since it is legal game.

The coot was first recorded on the area October 4 when 15 birds were seen at station 1. The coot population, which made up 12.4 per cent of the fall flight, was distributed between stations 1 and 2. The peak of the fall flight came on October 15 when 33 coots were recorded.

A single coot was recorded at station 5 on February 9 and remained here throughout the winter. When the spring thaws came the coot was recorded exclusively at station 3 of Geddes Pond. This single coot was seen up until April 19, at which time it was joined by another coot.

The coot exhibited territoriality more than any other species on the area. It was found in the same exact location at station 5 throughout the winter, and later in the spring it established a territory at station 3. The coot, however, did not show any aggression towards other species when they trespassed upon his territory.

SUMMARY

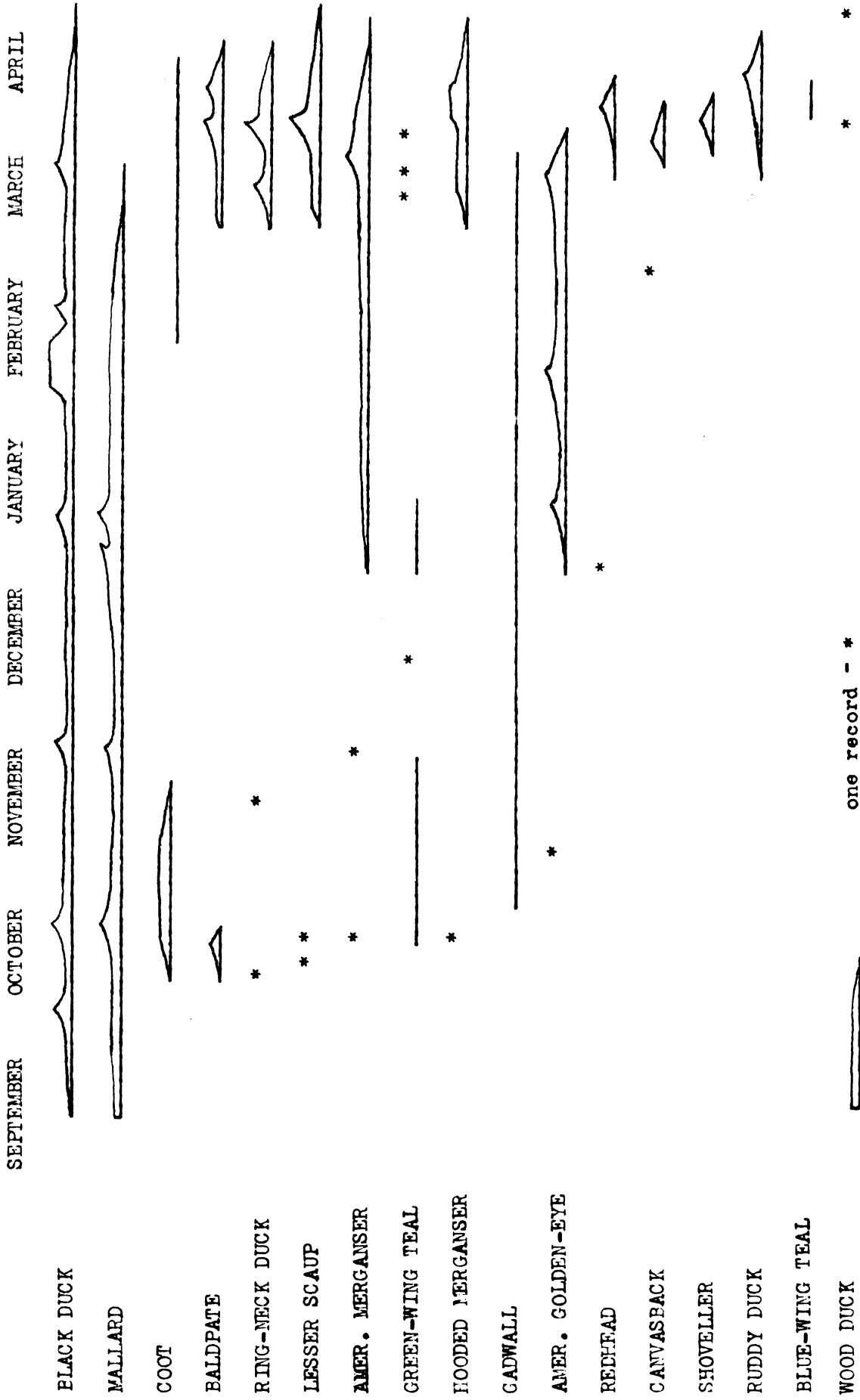
- 1) Observations of the waterfowl population on the Huron River in the vicinity of Ann Arbor were made from September 16, 1946, to April 27, 1947. The concentrations were observed through 7x35 binoculars.
- 2) There were 24 species of waterfowl observed on the area, which was divided into 9 waterfowl-study stations.
- 3) The black duck was the most common (abundant) species on the area during all seasons.
- 4) Courtship activities were recorded during January, February, March, and April, and were the most intense during March. Those species which were observed rendering some form of courtship were: the black duck, American golden-eye, lesser scaup, American merganser, and the ruddy duck.
- 5) Copulation of the lesser scaup was observed on April 25.
- 6) It became evident from this study that certain waterfowl used one flyway during the spring and another during the fall, or that they frequented different habitats during these two flights.
- 7) The fall migration was extended and had several peaks, whereas the spring migration was more direct and had one main peak during the latter part of March and early April.
- 8) Males were more abundant than females for all species

except the canvasback and the shoveller, which showed a preponderance of females, and the ruddy duck, which had an even sex ratio.

- 9) The following species spent all or part of the winter season on the area: black duck, mallard, American golden-eye, American merganser, gadwall, green-winged teal, redhead, canvasback, old-squaw, and coot.
- 10) The highest seasonal and monthly populations were recorded in the winter.
- 11) Geddes Pond was the best area between Ypsilanti and Ann Arbor as far as waterfowl populations were concerned.
- 12) The chart on the following page shows the length of stay and population trends for those species which formed the bulk of the total population on the study area.

CHART SHOWING LENGTH OF STAY AND RELATIVE ABUNDANCE OF 17 SPECIES OF WATERFOWL

ON THE HURON RIVER IN THE VICINITY OF ANN ARBOR, MICHIGAN. 1946- 47



one record - *

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