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FISH AND WILDLIFE MANAGEMENT
REPORT

PROVINCE OF ONTARIO
DEPARTMENT OF LANDS AND FORESTS
Division of Fish and Wildlife

Hon. Clare E. Mapledoram
Minister

F.A. MacDougall
Deputy Minister

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(THESE REPORTS ARE FOR INTRA-DEPARTMENTAL
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THE 1954 DEER SEASON IN PEMBROKE DISTRICT.

by
K. K. Irizawa

It was decided prior to deer season that a fact finding survey would be made of district hunt camps operating on a land use permit and of all tourist outfitters catering to deer hunters. This would supplement the data from the regular week-end road checking stations maintained by other districts to the south and west of this district. These stations supply some data which can be used to gauge hunters' success and effort expended, but not sufficient for a true picture, hence this survey was initiated to fill in the gaps. This report consists of two parts, the first, based on the road check data and the second based on the hunt camp data.

A. Road Check Data

Pembroke District deer were checked at Arnprior, Kaladar and Millbridge in the Tweed District, at Burleigh Falls and Norland in the Lindsay District and at Gravenhurst in the Parry Sound District.

The summary of the compilations of the data from the road checks is as shown below:

Total deer from Pembroke District	- 295
Total number of hunters	- 844
Average hunter success	- 35.0%
Total days of hunting	-4434
Average man-days per deer	- 15.0

Deer ages were read, sexes noted and weights recorded simultaneously with the collection of kill, hunter success and effort data at the road checks.

Age Class Distribution

Total deer checked	- 295	% checked	- 100.0%
Bucks	- 120	% Bucks	- 40.7%
Does	- 92	% Does	- 31.2%
Fawns	- 82	% Fawns	- 27.8%
Unknown	- 1	% Unknown	- 0.3%

Age	Total No. of Deer	Bucks	Does
1½	58	41	17
2½	38	21	17
3½	34	20	14
4½	17	10	7
5½	4	3	1
6½	1	1	-
7½	4	1	3
7½ +(10½)	1	1	-
Unaged	56	22	33

The selection exercised by the hunters in sex preference of deer is clearly shown when the total numbers of deer is broken down to its buck-doe components.

Weight Summary

	Bucks		Does		Sexes Combined	
Age	No. Weighed	Aver. Wt.	No. Weighed	Aver. Wt.	No. Weighed	Aver. Wt.
½	12	69	10	64	22	67
1½	7	110	4	106	11	109
2½	4	148	2	107	6	135
3½	5	153	4	122	9	139
4½	5	176	-	-	5	176
5½	2	192	1	130	3	171
6½	-	-	-	-	-	-
7½	1	221	1	100	2	160
Unaged	1	179	-	-	1	179
Totals	37	-	22	-	59	-
Not Weighed	128	-	108	-	236	-
Grand Total	165	-	130	-	295	-

When the check cards were sorted to townships and success computed on this basis it was found that owing to inaccuracies in locations, the information was of doubtful nature. In addition, the samples were too small in most cases. Hence, it was felt that grouping townships in groups of 4 - 6 consistent with local topographical features would be least confusing and would likely contribute least bias in the analysis. The townships were grouped as follows with the approximate proportions of forested and "open" country shown as percentages and the predominant species shown for each unit.

Unit I - consists of part of Boyd Township and Cameron, Clara, Maria, Head and Rolph Townships.
- 80% forested and 20% open.
- immature stands of poplar, white birch, white and red pine.

Unit II - consists of Wylie, Buchanan, McKay and Petawawa Townships.
- 40% forested and 60% open.
- mixed stands of hardwoods and conifers.

Unit III - consists of Pembroke, Stafford, Westmeath, Ross, Bromley and Wilberforce Townships.
- 5% forested and 95% open.
- highest populated unit with most cleared land. Only isolated mixed stands.

Unit IV - consists of part of Brudenell Township and Fraser, Richards, Alice, Hagarty, North Algona and South Algona Townships.
- 50% forested and 50% open.
- predominantly hardwoods.

Unit V - consists of part of Radcliffe Township and Burns, Dickens, Jones and Sherwood Townships.
- 85-90% forested and 15-10% open.
- mostly hardwoods predominate.

Unit VI - consists of part of Airy Township and Lyell, Murchison and Sabine Townships.
- 90% forested and 10% open.
- again predominantly hardwoods.

Unit No.	No. Deer	No. Hunters	Total Man-days	% Success	Effort/Deer
I	50	171	1026	29.2	20.5
II	70	163	912	42.9	13.0
III	2	10	65	20.0	32.5
IV	47	133	629	20.0	13.4
V	59	171	855	34.5	14.5
VI	63	179	875	35.2	13.9
Unknown	4	17	72	23.5	18.0
Totals	295	844	4434	35.0	15.0

B. Hunt Camp Data

In spite of the short notice given the hunters and considering the innovation of the forms which entailed some writing, the co-operation of the parties was very gratifying. Of the 107 hunt camps canvassed, 88 sent or brought in replies. Of the 52 outfitters contacted only 8 replies were received. The hunt camp returns amounted to a good 82% whereas the outfitters returns totalled a disappointing 15%. The hunt camp data are shown below, the 1954 data the first mentioned in each case. Here again the sample from individual townships was too small in most

cases thus necessitating the use of townships units. These units are the same as those used in the road check section for ease in comparison.

1954 Hunt Camps

Unit No.	No. Deer	No. Hunters	Total Man-days	% Success	Effort/Deer
I	99	145	1055	68.3	10.7
II	131	190	1330	68.9	10.2
III	1	2	1	50.0	1.0
IV	56	115	720	48.7	12.9
V	44	76	437	57.9	9.9
VI	45	79	434	57.0	9.6
Totals	376	607	3977	61.9	10.6

1953 Hunt Camps

Unit No.	No. Deer	No. Hunters	Total Man-days	% Success	Effort/Deer
I	82	130	952	63.1	11.6
II	125	189	1401	66.1	11.2
III	-	-	-	-	-
IV	53	116	702	45.7	13.2
V	34	66	428	51.5	12.6
VI	36	62	418	58.1	11.6
Totals	330	563	3901	58.6	11.8

The tourist outfitters' returns though meager furnish additional information on the 1954 deer season as compared with the 1953 season and some indication of the success and effort.

Year	No. Deer	No. Hunters	Total Man-days	% Success	Effort/Deer
1954	45	100	514	45.0	12.7
1953	50	134	696	37.3	13.9

Age Class Distribution

1954 Hunt Camp
Total Deer - 376
Bucks - 194 (51.6%)
Does - 115 (30.6%)
Fawns - 67 (17.8%)

1953 Hunt Camp
Total Deer - 330
Bucks - 175 (53.0%)
Does - 109 (33.0%)
Fawns - 46 (13.9%)

Jaws from 226 animals were collected or sent in for age reading. The jaws were either sent in by hunt camp parties or collected in the field by the biologist and conservation officers or collected at the fast freeze lockers in the district by previous arrangement.

The age class distribution was found to be:

Age	½	1½	2½	3½	4½	5½	6½	7½	7½+ =(10½)
No. of Deer	77	58	33	23	22	2	7	3	1

The ages were read using as aids the "Summary of Criteria for Aging Deer" prepared by the Department and a fairly good check set of sample jaws assembled by Mr. Passmore. After all the jaws were read, Mr. Thompson of Tweed, a proficient "deer ager" was consulted to confirm the age readings. With the exception of 2 or 3 doubtful ones, Mr. Thompson's readings tallied with that of the author's.

When the age distribution curves were plotted there was a great temptation to draw conclusions from the weak 5½ age class, but this would be folly indeed until proper weather records can be correlated with the data. It is hoped that past weather records can be obtained from the meteorological station at the Killaloe airport or the Dominion Forestry Station at Chalk River or the Atomic Energy Plant at Chalk River so that we may draw stronger conclusions.

No weights were recorded of the hunt camp deer. This accomplishment would certainly enhance the overall deer data and allow a further source of comparison between the hunt camp and road check systems of checking. For the present there are too many variables to deal with between the two types of sampling. Although the age class distribution is reasonably similar, success and effort figures show considerable difference. In summary we might say that the 1954 deer season in Pembroke district was fairly successful. It has been shown through effort per deer and success data that certain "intangibles" figure heavily in the success of the hunt. The organized nature of the hunt camps and the familiarity of the area in which the camp owners hunt are undoubtedly related to the success of the camp members. Weather may be considered as one of the "tangibles" determining the success of the hunt.

Over one third of the hunt camp returns carried some sort of voluntary unsolicited information or complaints. Chief among these were remarks about the choice of the season, about the use of dogs, and about the congestion of hunt camps in some areas further accentuated by "squatters in trailers and tents". Eleven parties voiced protests on the use of dogs, three parties against congestion, three

parties for an open moose season, one party for the season as is (they got a full count!), and six parties for a later season commencing on or about November 15th.

A petition in favour of a later season and signed by 51 local hunters was received by the district office and sent to Toronto office for further attention.

SUMMARY OF LIVE MARTEN TRAPPING, 1950 - 1954.

by
V. Crichton

Live marten trapping from 1950 - 1954 was carried on in the Chapleau District. Table 1 is a list of lakes in the Chapleau Game Preserve where this trapping was carried on.

TABLE I

Little Missanabie Lake	-	1952 - 1953	
East Lipsett Lake	-	1952 - 1953	
Robson Lake	-	1950	
Makonie Lake	-	1950	
Nicholson Creek	-	1952 - 1953	
Schewabik Lake	-	1950 - 1952	1953 - 1954
Lipsett Lake	-	1950 - 1951 1954	1952 - 1953
Bolkow Lake	-	1954	

During this period a total of 244 marten were live trapped, of which 179 were males and 65 were females. For the purpose of this report only the live trapping projects at Lipsett and Schewabik Lakes will be compared, as these two lakes are by far our major source of marten.

In Table 2 is presented a comprehensive summary of live marten trapping at Lipsett Lake.

TABLE 2 - Catch of Marten at Lipsett Lake

Period	No. of Trap Days Per Animal Unit Caught	Male	Female	Total
Sept. 2-Sept. 14, 1950	23.1	9	4	13
Aug. 19-Sept. 10, 1951	25.4	20	9	29
July 22-Aug. 15, 1952	25.4	29	9	38
July 8-Aug. 6, 1953	29	25	10	35
Aug. 13-Sept. 18, 1954	59	15	6	21
		98	38	136

Year	No. of Traps Closed	Other Animals Caught
1950	19	1 Mink, 1 Skunk, 1 Red Squirrel
1951	17	1 Red Squirrel, 2 Mink, 4 Skunk, 1 Hare
1952	46	4 Ground Hogs, 2 Hare, 2 Red Squirrel, 1 Mink, 1 Skunk
1953	28	6 Red Squirrel, 5 Hare, 7 Woodchuck, 1 Skunk, 1 Fisher
1954	33	5 Red Squirrels, 3 Skunks

It will be noted that the sex ratio is from 2:1 to 3:1 with an average of 2.5 males per female during this period. The number of trap-days per animal caught have increased from 23.1 to 59, the greatest yearly increase being from 29 in 1953 to 59 in 1954.

Table 3 is a comprehensive summary of live marten trapping at Schewabik Lake.

TABLE 3 - Catch of Marten at Schewabik Lake

Period	No. of Trap Days Per Animal Unit Caught	Male	Female	Total
Sept. 27-Oct. 14, 1950	27.4	4	3	7
Aug. 17-Sept. 7, 1952	16.2	11	4	15
July 4-Aug. 2, 1953	34.6	17	4	21
Aug. 13-Sept.18, 1954	40.8	15	3	18
		47	14	61

Year	No. of Traps Closed	Other Animals Caught
1950	3	1 Porcupine
1952	15	8 Mink, 1 Woodchuck, 1 Muskrat, 1 Flying Squirrel
1953	83	4 Woodchuck, 1 Hare, 2 Red Squirrels
1954	27	4 Red Squirrels

It will also be noted that the sex ratio is from 1.3:1 to 5:1, with an average of a little over 3 males to 1 female during this period. The number of trap-days per animal caught has risen from 16.2 in 1952 to 40.8 in 1953, with a decrease noted from 27.4 in 1950 to 16.2 in 1952. Trapping was not carried on in 1951. It might be assumed that because this area was not trapped in 1951 there were many more animals to be had in 1952. Such was not the case, as the number of trap-days per animal caught was due to better knowledge gained of trapsites from experience of trapping at Lipsett Lake in 1951.

The overall sex ratio accumulated from all live marten trapping over the past five years is 2.75 males to 1 female.

A comparison of sex ratio of marten from live trapping may be compared with that of the Experimental Trapline and with pelts presented for sealing in the Chapleau District.

Table 4 is a summary of sex ratio of marten taken from the Experimental Trapline.

TABLE 4 - Sex Ratio of Marten from Experimental Trapline

	Male	Female	Total	Ratio Males Per Female
1951-52	46	17	63	2.7 - 1
1952-53	44	23	67	1.9 - 1
1953-54	44	30	74	1.3 - 1
	134	70	204	

It will be seen that there is a variation in sex ratio from 2.7 males per female in 1951-52 to 1.3 males per female in 1953-54, with a three-year average of slightly less than 2 males per female.

Table 5 is a summary of sex ratio and marten presented for sealing in Chapleau District for the trapping seasons of 1952-53 and 1953-54.

TABLE 5 - Sex Ratio of Marten Presented for Sealing in Chapleau District

	Male	Female	Total
1952-53	212	113	325
1953-54	240	109	349
	452	222	674

It is interesting to note that this also works out to an average of slightly more than 2 males per female.

Therefore it seems logical to assume that male marten outnumber female marten by a ratio of at least 2 to 1. But upon examining the data in Table 4, it is readily seen that the take of female marten has nearly doubled in two years while the take of male marten remains fairly constant. The ratio of male to females on the experimental trapline has been reduced from 2.7:1 to 1.3:1 in two years. This may be the result of intensive trapping. The trapping pressure applied to live marten trapping is

not nearly as great as the trapping pressure on the Experimental Trapline.

Table 6 shows the disposition of the live marten for the past five years.

TABLE 6 - Disposition of Live Marten

1950

	Male	Female	Total
Sibley Park	11	7	18
Released at Schewabik Lake	3	2	5
Died in Captivity	3	0	3
	17	9	26

One marten caught at Lipsett Lake, released at Schewabik Lake and later retrapped has been tallied as two marten, whereas in reality it is one individual marten, making a difference of one between those caught as 27 and disposition of same shown as 26.

1951

	Male	Female	Total
Kenora	8	5	13
Albany River Forks	8	2	10
Died in Captivity	0	2	2
Killed for examination by Dr. Sprent	3	0	3
Donated to Dr. Sprent	1	0	1
Sibley Park	0	1	1
	20	10	30

One female taken on Experimental Trapline was shipped to Port Arthur for release in Sibley Park.

1952

	Male	Female	Total
Kenora	4	2	6
Ponask Lake - Northwest of Sachigo Lake	9	3	12
Junction Winisk and Asheweig Rivers	16	6	22
Sutton Lake	12	4	16
Albany River	11	3	14
Escaped	2	0	2
Died in Captivity	2	0	2
Released	1	0	1
Donated to Ottawa Exhibition	1	0	1
	58	18	76

1953

	Male	Female	Total
Large Lake 15 miles N.W. of Junction of Asheweig and Winisk Rivers (Willow Bark L.)	17	5	22
Little Sachigo Lake	16	5	21
Sutton Lake	10	6	16
Algonquin Park Research	1	0	1
Released	1	0	1
Escaped	1	2	3
Died in Captivity	6	3	9
	52	21	73

Two males were traded to Gogama for two females.

1954

	Male	Female	Total
Big Trout Lake (Otter Lake)	11	6	17
Albany River (50 miles from Fort Albany)	14	3	17
Algonquin Park Research	1	0	1
Died in Captivity	4	0	4
	30	9	39

Summary:

All places in Table 1 are situated in the Chapleau Game Preserve, with the exception of Schewabik Lake and Nicholson Creek. The westerly shore of Nicholson Creek and Schewabik are situated in the Chapleau Game Preserve while

the easterly shore is not within its borders. Marten trapping was carried out on both shores of Schewabik Lake and Nicholson Creek.

The large increase in the number of trap-days per animal harvested may be due to three factors:

1. Overtrapping.
2. Downward trend in overall marten population.
3. Lack of enthusiasm on part of trappers.

Some comparison of the above no doubt may be made from the results of the experimental trapline during the coming season of 1954-55.

While a great deal is known about marten trapping in general, a great deal is yet to be learned. It is known that the best habitat for marten trapping during the summer is along waterways on which are stands of mature mixed forests; but it is also known that during this period, marten may be trapped in areas along waterways with large stands of young birch and poplar. However, the ratio of males to females in this period is very high and there does not seem to be any definite proof that this is the case in the over-all population.

The following factors may account for this ratio:

1. Traps were set, up to 75 feet from the water's edge. Female marten with their young may dwell well beyond this line, away from the males.

2. There might be some correlation between the habitat of one sex and the breeding season.

Of all the marten taken during live trapping operations, only one has been definitely established as being a young of the year.

It is also known that when poaching was carried out to a great extent in the Chapleau Game Crown Preserve, poachers in the fall and early winter would run lines of marten and fisher traps, well back from the water into dense stands of pines and spruce. Trappers very often do the same thing on their traplines, harvesting greater numbers of marten back from the water courses than along the partially frozen shores of lakes and rivers.

It is reasonable to assume from these observations that marten do change their habitat throughout the year. This may well be from a correlation of timber types and prey species or with the coming of cooler and colder weather that marten as well as prey species have no choice

but to extend their range in search of food.

The ratio of males to females is at least two to one when trappers pursue their normal routine. This would lead one to believe that the ratio of two males to one female is natural. A trapping program immediately before the birth of the young may support these conclusions.

Acknowledgment is made to the considerable contributions from Percy Swanson, Tom Cachagee and Chris Elencoff, Wildlife Management Officer and trappers who were employed on Live Marten Trapping and Experimental Trapline.

ANNOTATED LIST OF BIRDS SEEN AT KASABONIKA LAKE, MAY 27TH -- JUNE 5TH, 1953.

by
A. T. Cringan

The writer and D. VanVliet, Student Assistant, spent the period May 27th - June 6th, 1953, at Kasabonika Lake, engaged in beaver disease investigations. We were guided for part of this time by Sammy Albany, a Treaty Indian of the area. Bird observations made during this period were recorded. Adequate records were kept for only ten days, excluding June 6th.

The area investigated lay about the west end of Kasabonika Lake, around Lat. 53° 45' N., Long. 88° 35' W. The west end of the lake is some 290 miles N.N.E. of Sioux Lookout, and about 170 miles S.S.W. of the Hudson Bay Coast.

Breakup of Kasabonika Lake occurred on May 26th, and there was still drifting ice present on the day of our arrival. This fact undoubtedly has an important bearing on the waterfowl noted during our trip.

Common Loon

Between one and three loons were seen on four out of the ten days afield.

American Bittern

One bittern was seen on May 28th.

Canada Goose

One or two Canada geese were seen along a river to the south of Kasabonika Lake on June 4th. In view of the date of this observation, it is likely that this species nests locally, if only in small numbers.

Mallard Duck

From one to eight mallards were noted on nine out of the ten days afield. Thirty-six birds noted included seven pairs, ten drakes, two ducks, and nine unidentified. Nesting activity may be indicated by this sex-ratio. Most mallards were seen in marshy stretches along the streams flowing into Kasabonika Lake.

Black Duck

Two black ducks were seen on May 28th, and three on June 4th. This species is decidedly less common than the mallard, but occurs in the same general places.

Baldpate

Between two and six baldpates were noted on three different days. These birds were seen principally along rivers, or else around marshes on bays of the lake. Six of the birds were paired off, and we were unable to ascertain whether the other six were or not.

Green-winged Teal

Remains of a green-winged teal were found around our camp. The bird had probably been killed by an Indian shortly prior to our arrival.

Ring-necked Duck

Two male and one female ring-necked ducks were seen along a stream to the south of Kasabonika Lake, on June 3rd.

Lesser and Greater Scaup

Scaups, from two to ten daily seen between May 27th and 29th on the lake, were considered to be greater scaups. A pair of scaups on June 1st, four birds on June 3rd, and two pairs on June 4th, all seen on rivers, were judged to be lesser scaups.

Common Golden-eye

This was one of the commonest ducks present in late May and early June, and from two to twenty birds were seen on eight days out of ten. The last pair seen was on May 28th, but a female was seen on June 5th. The first definite flocking of males was noticed on May 31st, and flocks of males were seen until June 4th. The favourite haunts of these flocks of males appear to be the small, shallow lakes which are mere stream expansions.

Old-squaw

A male and two females were seen on Kasabonika Lake on May 27th, and a female on a broad stretch of the Asheweig River on June 1st.

White-winged Scoter

A total of eighty-eight white-winged scoters was seen, from one to thirty-four birds per day on seven out of the ten days. All white-winged scoters seen were on the larger lakes. Greatest numbers were seen from the 28th to the 31st of May, after which they were seen much less frequently and in smaller flocks.

Surf Scoter

Twenty-seven seen on May 28th, ten on May 29th, and three on June 1st, were all on the larger lakes. One surf scoter was seen in a small, shallow lake along a stream travelled on June 4th.

American Scoter

Four American scoters were seen on Kasabonika Lake on May 29th.

Hooded Merganser

One male and two female hooded mergansers were seen on Kasabonika Lake on May 31st. A group of three males was seen on a small lake near the Asheweig River on June 1st. Three individuals of this species, unidentified as to sex, were seen along the stream travelled on June 2nd.

Common Merganser

Between one and five common mergansers were recorded on seven different days. Pairs were seen on June 1st and 2nd, and otherwise nine drakes and 12 unidentified individuals of this species were seen. It occurred along streams as well as on large lakes.

Red-breasted Merganser

From one to seven birds of this species were seen on five days, and a flock of 20 on a sixth day. It was seen only on Kasabonika Lake. In all, eighteen males, eleven females, and four unidentified were seen.

Sharp-shinned Hawk

One sharp-shinned hawk was seen on June 3rd.

Marsh Hawk

A marsh hawk was seen on June 4th.

Osprey

Only one osprey was seen, on May 28th.

Killdeer Plover

One bird was noted on two days, May 27th and June 5th, near the Kasabonika Post on both occasions.

Spotted Sandpiper

Between one and five spotted sandpipers were seen on five different days. None was seen until May 30th, which may indicate arrival at that time. Seen both around large lakes, and along streams.

Solitary Sandpiper

One seen on June 2nd, and 4th, and eight on June 3rd. Seen only along streams, and it would appear to be fairly common in places.

Greater Yellow-legs

One was seen on June 3rd, and two on June 4th along streams.

Lesser Yellow-legs

Five lesser yellow-legs were seen on June 3rd, along a stream and its associated lakes.

Semipalmated Sandpiper

This species was identified only twice, on June 3rd and 4th, one bird having been seen on both occasions.

Herring Gull

Herring gulls were seen daily, in numbers ranging from one to seven. Two nests of this species were seen on June 4th. The first was made of moss, on top of a boulder five feet across, and contained two eggs. The other was on another boulder rising out of the same lake, was extremely well constructed out of grasses, horsetail, and contained one egg. The lake where these nests were found was one of the small, shallow lakes, little more than a stream expansion.

Common Tern

Commencing May 28th, from one to eight common terns were seen on six different days. No breeding record was established.

Great Horned Owl

A great horned owl was seen on the evening of June 5th.

Nighthawk

Only one nighthawk was seen on June 1st. This probably represents the arrival date for the area.

Belted Kingfisher

A few kingfishers occur around Kasabonika Lake. One or two were recorded on three different days.

Yellow-shafted Flicker

This was the only woodpecker recorded by us, and even it was not particularly common. From one to three noted on four different days.

Least Flycatcher

One least flycatcher was noted on June 1st, and four on June 3rd.

Tree Swallow

Irregularly noted, from one to twenty individuals having been seen on five different days. This species appeared to be fairly common about certain small lakes and streams travelled.

Canada Jay

Canada jays were noted on seven different days, with daily totals ranging from one to ten. A brood of three young out of the nest was seen on May 30th, and one juvenile was seen on May 31st.

Raven

From one to three ravens were seen on six different days. A raven carrying food was seen on May 31st.

American Robin

The robin is quite common around Kasabonika Post, and not uncommon elsewhere in the area covered. Between two and ten robins were seen on each of five different days.

Hermit Thrush

Two hermit thrushes were heard on May 30th, and two seen on June 1st.

Olive-backed Thrush

One individual of this species was seen on June 4th.

Ruby-crowned Kinglet

This kinglet was quite conspicuous, owing to its singing, during the time of our field trip, and from one to five were noted on nine of the ten days for which records were kept.

Yellow Warbler

Not seen until June 1st, when one bird was recorded daily on four occasions.

Magnolia Warbler

I did not become aware of the presence of magnolia warblers until June 2nd, and suspect that I overlooked them prior to that time. They were quite common along the willow-and alder-bordered streams, and as many as ten were recorded daily.

Myrtle Warbler

This warbler was quite common at the time of our visit, and, among the warblers, was probably second in abundance only to the northern water-thrush. From two to twenty individuals were recorded on seven of the ten days afield. This species was commonest along streams.

Black-poll Warbler

Two individuals of this species were seen on June 3rd, and another on June 4th.

Palm Warbler

One palm warbler was seen on June 3rd.

Northern Water-Thrush

Water-thrushes are very common in the area, and are round both along the lakeshore and along streams. The species was seen or heard daily, with daily totals ranging from two to twenty.

Maryland Yellow-throat

Two birds of this species were recorded on June 3rd. They were occupying a stream-bank habitat.

Rusty Blackbird

Not noted until June 1st, when we began encountering them along the streams travelled. From one to six were seen on three different days.

Redpolled Linnet

Two birds of this species were seen at Kasabonika Post on May 27th.

Savannah Sparrow

One savannah sparrow was seen on June 3rd, in a meadow along a stream travelled that day.

Slate-coloured Junco

Juncos are not uncommon in the area visited. Between one and ten were noted on six different days.

Tree Sparrow

A tree sparrow was seen on June 2nd. I believe that several others were heard, but I did not recognize them.

White-crowned Sparrow

One individual of this species was seen at Kasabonika Post, on May 27th.

White-throated Sparrow

This sparrow is one of the commoner and better-distributed birds around Kasabonika Lake. From one to three were noted daily on nine out of ten days afield.

Fox Sparrow

Three fox sparrows were seen on June 3rd. As in the case of tree sparrows, I believe I heard others, but was uncertain of their identity.

Song Sparrow

Song sparrows occur here and there in good sites along streams. Single birds were seen or heard on six different days.

Summary and Comment

Fifty-seven species of birds were noted during the field trip in the Kasabonika area. Undoubtedly, several of these are merely migratory in this area, but field work stopped too early to establish which species belong in this category.

Proof of nesting was established only for the herring gull and the Canada jay. It also appeared that ravens were nesting at the time of our trip.

REPORT

OBSERVATIONS OF SMALL MARSH DEVELOPMENT IN UPPER NEW YORK STATE

by J. B. Dawson

A small marsh development program has been in effect since 1948 in New York State. This program, under Section 48D (amended in 1951) of the Pittman-Robertson Act, was initiated to provide additional wildlife areas with particular attention to nesting and migration rest areas for ducks. The 48D program actually stemmed from an anticipated post war recession and work shortage.

The New York State Conservation Department has built upwards of 500 ponds in the last six years, most of these utilizing runoff water from the surrounding watershed. The majority have been constructed during the last three years.

For the three-year period, 1948 to 1951, construction costs of wildlife marshes were borne in part by the State and in part by the landowner. Under this system costs of $25.00 up to a maximum of $250.00 per developed marsh acre were borne by the State. Agreements were made with landowners concerning the operation of water control structures and the posting of the pond areas for a certain length of time.

Under the above system, many problems arose: water control structures were tampered with, ponds were not posted, and muskrats became a real problem because of undertrapping. Since it was felt that marshes should be under more rigid control by the State, the 48D act was amended in 1951. This act, now in effect, gives the State power to construct marshes at a cost of $50.00 per water acre, total cost not to exceed $500.00 and the total cost to be borne by the State.

Under the present system land leases are obtained from the landowner, the length of lease being arrived at by the following formula:

$$\text{Length of lease} = \frac{\text{Total Cost to State}}{\$5.00 \times \text{size (acres at normal water level)}}$$

The landowner, under such a lease, agrees to post his land to hunting for the length of the lease. Fishing and trapping are allowed, however.

48D marshes are constructed both on state and private land, most work being done on the latter, since acreage owned by the State is small.

Although a number of the marshes visited in upper New York State are located on good agricultural soil, marshes are generally situated on the poorer agricultural soils. Of the

marshes visited in Erie, Niagara, Genessee and Eyoming Counties, limiting factors to agriculture are: general topography and fertility, drainage, (especially in the Niagara and Erie clay plains), acidity, and soil texture. As mentioned, some ponds are constructed on good agricultural land. This is in large part due to the fact that some land owners are not interested in tilling their land since they work in urban areas. This type of landowner is usually very pleased to have work done on his land by the State Conservation Department.

Marshes visited built on good agricultural soil were mainly of a pasture-type nature. These ponds, completely devoid of other than herbaceous cover, were built to attract such species as the Mallard which favors the open grassland type of nesting area. Such areas apparently are scarce in New York State. Marshes situated on marginal lands usually have considerable cover, usually in the form of trees, such as willows, alders and other water-tolerant species. Some ponds are built on wooded areas; this type has good nesting sites for both the wood duck and the black duck.

The success of an impoundment in large part depends upon the type and fertility of the soil on which it is built. Soil texture must, of course, be of such a type as to hold water, if the pond utilizes runoff water; fertility determines in large part the productiveness of the vegetation and hence of the waterfowl using the established impoundment.

I shall but briefly outline the basic principles and engineering standards, along with a few of the problems, encountered in the construction of P. R. marshes; a detailed description of engineering standards and marsh construction can be obtained from the New York State Conservation Department's Engineering Handbook.

All but one of the marshes visited in New York were of the "runoff" type. This type of pond utilizes the natural runoff from its watershed to maintain water levels. It appears that very few ponds other than the "runoff" type are built in New York State.

Engineering standards limit watersheds to a maximum of 40 acres of watershed to each water acre of marsh. Minimum area of watershed is not specified, and at least two marshes visited had no more than one acre of watershed for each water acre of marsh. These ponds were built on heavy impervious clays, the only "drawdown" caused by normal evapo-transpiration from the marsh.

None of the marshes visited were built on permanent streams; some were said to be spring-fed but they were very much in the minority.

Some marsh improvement work done in New York State does not come under Section 48D. Several large marshes have been bought and improved by the State, one of which we visited.

This was the Schmitt marsh near Corfu, New York. This area, of 417 acres, was bought from a Mr. Schmitt by the State in 1942 for $10.00 per acre. Dikes were built and the high water of spring freshets from an adjoining creek used to replenish water levels.

Although dike construction costs on such a site are naturally much higher than on a regular 48D marsh, the cost per bird utilizing the area is less than that of those using the regular 48D marshes. Revenue from the large muskrat population on such a marsh would go far in meeting maintenance costs.

We were particularly impressed with this large marsh. To us it appeared that for the money expended, good wildfowl value was being returned. It is quite true that some of the smaller marshes visited appeared productive as far as ducks are concerned. Various factors limit the duck utilization of a very small water area, however, one of which is species tolerance. If migrating ducks do use these small areas in fall in any numbers (and it is said they do) one may visualize their vulnerability in years to come when ponds are no longer posted.

Site selection plays a very important role in the success of marsh development, and is a factor which cannot be too strongly emphasized. Under the present system of state financing, there seems to be no problem in obtaining sites for development; the problem lies in the screening of proposed sites. This is not easily done and experience is the greatest aid in site assessment.

Following a preliminary inspection the proposed marsh area is surveyed to obtain slope and ground levels. It is preferable to conduct this survey in the spring or autumn when tree leaves do not hinder transit sightings.

Contours are generally plotted at one foot intervals. Plans are drawn up and the dike dimensions, depth of water and area of land to be flooded are computed.

Of the impoundments visited, all but one were built by bulldozer. The exception was a small concrete overfall dam controlling the runoff of some 60 acres of watershed along with the water arising from a small spring.

The New York Conservation Department owns and operates two bulldozers, others being brought in from private sources as required. It is generally conceded that the larger the bulldozer the more economical the operation, especially if a large dike is to be constructed.

Cost of moving earth varies with size of bulldozer, type of soil and moisture conditions. Dry soil can be moved at a cost of 10 to 20 cents per yard, depending on dozer size.

A large International TD18 costs approximately $15.00 per hour, and the smaller TD 9 costs about $10.00 per hour.

Bulldozers do not work efficiently in muck soils; if these are to be moved, draglines must be set up on mats. This is an expensive method costing from 50 to 70 cents per yard. For this reason, wet, low-lying situations are avoided if possible. In any case, dike work is generally done in late July and August when the earth is fairly dry.

In dike construction, the organic topsoil is not used, this being pushed away from above the dike site and also from above the "borrow pit". A narrow core trench, triangular in cross section, is dug on the centre line of the dike. This is filled with the heaviest clay available and acts as a seal between the ground and the dike fill. Dike fill is obtained from the "borrow pit". This fill should not contain stones or other debris; the closer that dike fill approaches the clay in texture the better. Fill is compacted during dike construction by the heavy bulldozer which is driven back and forth over the dike.

Dikes are constructed so that there is one foot of freeboard above water level, one foot of dike until the emergency spillway level is reached and at least another foot of fill above this.

Vegetative spillways are constructed as a safety feature to take off excess runoff or rainfall. It is imperative that sufficient cover be grown on the spillway to withstand the spring runoff. It was pointed out that wherever possible, a natural grassed spillway should be utilized since the cost of spillway construction is usually high and since a sod cover is sometimes hard to establish.

Water control structures are generally of the concrete box type with wooden flashboards controlling the water level. Overflow is removed by means of a corrugated metal pipe through the base of the dike.

It has been found that dike upkeep constitutes a major problem. Dikes must be seeded down as quickly as possible to curb erosion. Weeds, and trees especially, must be kept off the dike and muskrats must be controlled.

Muskrat damage to dikes is a serious problem in many instances. Dikes afford excellent situations for muskrat residences and they readily take advantage of them. Dikes become virtually riddled with muskrat burrows and occasionally ponds are seriously lowered because of muskrat tunnelling.

Much research on muskrat control is being carried on by the New York State authorities. Suggested controls include: wire screen on dike face, lower dikes, stone riprapping on dike face, cement or wire core in dike and earthern

berms extending out into the pond from the dike. This last feature has proved fairly successful. As seen in the accompanying diagram the berm is situated just lower than normal water level.

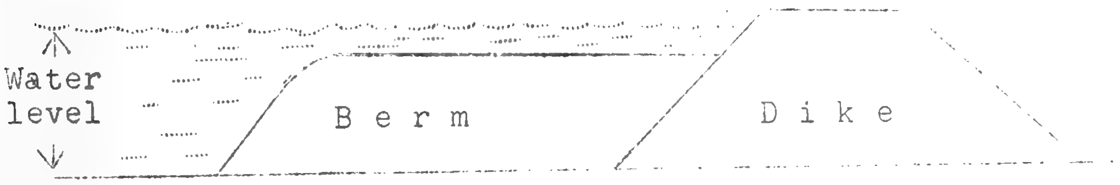

Diagram 2

Muskrats construct their entrances just below water level, and with a berm present cannot stay under water long enough to make a burrow from the berm's edge to the dike. Muskrats can, of course, be controlled by trapping, but landowners appear reluctant to trap intensively, if at all.

I have mentioned the fact that the New York authorities do not favour the construction of dikes or dams on permanent streams. For one thing, the area of watershed involved is usually too large to permit such a structure under State Engineering standards. These standards have rigid specifications concerning size and safety features of concrete over-fall dams and thus costs are generally prohibitive. We did visit, however, a spring fed, marshy situation which was greatly improved by means of a very small concrete overfall dam constructed across a small ditch draining the marsh. The watershed was composed of just 60 acres and the dam was not built to Engineering specifications. There was some doubt as to whether or not this dam would be allowed to stand. In this case the dam cost $200.00 and produced 6 acres of water area, and appeared perfectly adequate as far as water safety and control were concerned. If built according to engineering specifications it was estimated that costs would probably double or even triple.

During the summer of 1953 a "Pot hole" program was initiated in New York State. Under this program water areas of one acre or less may be constructed with a vegetated spillway as the only water control feature. These small ponds are usually built in conjunction with the larger P. R. marshes, and several P. R. marshes visited had up to half a dozen pot holes within a radius of one or two hundred yards. These pot holes can be constructed at a very low cost, perhaps averaging $40.00 each. Several of these pot holes which we visited were considerably larger than one acre and most of them appeared equally as productive as the more costly "engineered" ponds. Considering the sites which we visited, these small ponds appeared quite incapable of damage no matter what the runoff or rainfall might be.

Discussion and Criticisms

There seems to be a certain amount of antagonism by biologists towards the rigid adherence to engineering standards by engineers. It is generally thought by biologists that costs could be greatly lowered and impoundments would be more successful if each pond site could be treated individually, according to individual site specifications, with lowered engineering standards.

A debatable point is height of water control boxes. Boxes were designed in such a way that water levels could be manipulated and thus be used as a biological control. Biologists feel that the fact that runoff ponds can not be recharged during the summer was not considered when water control structures were designed. A water "draw-down" is advocated early in the summer in order to obtain maximum vegative growth; the fact that this "human" drawdown coupled with normal evapotranspiration drawdown sometimes results in a completely dry pond may not be fully appreciated by pond designers. Some biologists feel that water control boxes should be installed at a greater height; this would result in a greater than optimum (2½ feet) level during spring and early summer, but would insure at least some water during the dry periods in August and September.

Overemphasis of safety features is another point criticized by biologists. In some cases it would appear that this criticism is justified. One site visited had a watershed of not over 75 acres. The pond, about 10 water acres, had a tremendous dike (on which two cars could easily pass each other), a very large drainage tube, and wide spillways rip-rapped with stone. Under no stretch of the imagination could one visualize the need for the dike size and safety features present.

The cost of P. R. marshes is high, and unofficially, is actually much higher than allowed through the 48D Act. It appears that high construction costs are caused, in some instances at least, by over-engineered structures.

Several biologists stated that dike costs rose tremendously after a height of approximately 6 feet was reached. Thus a 9-foot dike was said to cost approximately twice as much as one 6 feet in height. This sharp rise in construction cost results, in the main, from reduced bulldozer efficiency.

It appears that some woody cover is essential in providing good nesting habitat for ducks. The New York Conservation Commission, in its attempt to attract Mallards through construction of the previously mentioned grassland-type ponds, is perhaps sacrificing total duck numbers.

For some time the lack of vegetation in many established marshes has been thought to be correlated with acid conditions. "Die off" in some impoundments seems to commence

about five years after flooding. Dr. Arthur H. Cook, Game Research Investigator, working on this problem at Cornell University, feels that he is about to arrive at a solution in the near future. Dr. Cook has shown, on the marshes which he has studied, that the presence of soluble iron is correlated with vegetative die off. The cycle goes somewhat like this: In a runoff type pond, the pond acts as a bank. Various elements are deposited by runoff water, but none are withdrawn. As a runoff pond ages, its dissolved O_2 content goes down while its dissolved CO_2 content goes up. When water containing CO_2 comes in contact with iron in the ferrous form, ferrous bicarbonate is formed.** This soluble $Fe\ H(CO_3)_2$ is readily taken up by plants and in the presence of manganese (taken up as manganous bicarbonate) is oxidized to the insoluble ferric form. Chlorosis develops and according to Curtis & Clarke (1950) this chlorosis is directly caused by an iron deficiency due to the presence of excess manganese.

When a pond suffering from iron and manganese toxicity is drained, however, soluble ferrous compounds are oxidized to insoluble ferric forms. Following drainage, ponds become most productive; photos taken by Dr. Cook before and after ponds were drained show remarkable vegetative comeback.

It appears that ponds must be completely drained to achieve satisfactory results; vegetation did not appear on soils that remained saturated, even though they were exposed.

If Dr. Cook's theories are correct, and present results would indicate that they are, then one can visualize the problem of the New York State Conservation Department -- none of their wildlife ponds have facilities for drainage!

Suggestions for Marsh Development in Ontario

If runoff ponds are to be constructed in Ontario, it appears that, if iron and manganese toxicity is wide spread, facilities for draining should be incorporated in the pond design. The toxicity problem might well be present in most Ontario soils and particularly in Eastern and Northern Ontari soil types.

In my opinion, much work might be done utilizing concrete overfall structures on very small streams or springs and particularly in stream head-water areas. Streams or springs overcome in large part the toxicity problem, since dissolved O_2 content is kept up and CO_2 content kept down. Concrete structures soon pay for themselves in lower main-

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**A reduction of iron to the ferrous form must first take place and the presence of a reducing agent is necessary for this. Decomposing organic matter is very effective, even in small amounts, in this respect. This reaction takes place only if dissolved oxygen is nearly absent ($\frac{1}{2}$ ppm or less) and pH is not above 7.5.

tenance costs; in fact it is said that maintenance costs on concrete structures are virtually non-existant. Cost of maintaining earthen structures is very high, especially if a muskrat problem is encountered.

Dams or dikes must, of course, be engineered for permanency and safety. However, overemphasis on engineering can soon push costs to a prohibitive height, especially with concrete structures.

Very small ponds should be avoided, in my opinion, unless they are in conjunction with a larger water area. Used in this manner, they serve a very useful purpose, in providing nesting areas for ducks.

The larger the water area, the greater protection afforded migratory waterfowl. Although additional ponds will spread hunting pressure, small impoundments afford little protection.

Although grassland-type ponds do possibly attract some mallards, it would appear that ponds with at least some woody cover produce a greater number of ducks.

State of New York
Conservation Department
Albany 1, New York

January 7, 1955

Dr. C. H. D. Clarke,
Supervisor of Wildlife Management,
Department of Lands and Forests,
Parliament Buildings,
Toronto 2, Ontario.

Dear Doug:

First, I want to express appreciation to Tony de Vos for supplying this office with a copy of his letter to you of September 9th and the report written by J. B. Dawson entitled "Observations of Small Marsh Development in Upper New York State."

We were all interested in Mr. Dawson's report, but I regret to say that we were made quite unhappy by several, of what appear to be, misunderstandings which have resulted in statements which we cannot accept as justified and in many instances are actually inaccurate. We are concerned because we understand that this report might be duplicated and distributed rather widely in Canada and if this were done, a biased picture would be presented which might possibly lead to harmful effects as regards our mutual efforts and interests in improving wildlife management practices.

I requested that Mr. Dawson's report be reviewed critically by those members of the Bureau of Game who are most concerned with the prosecution of our 48-D project. These include - Ben Bradley, Art Cook, Ralph Colson, Earl Westervelt, Barney Kelleher of the Engineering Staff of the Division, and A. S. Taormina, Ass't. Game Research Investigator, who was with Dawson on part of his tour of inspection of our 48-D program. They provided comments on Mr. Dawson's report, by page and paragraph, copy of which I am attaching. You will see from this why we are concerned.

I realize that many of Mr. Dawson's observations were not objective with respect to New York conditions because he at all times was probably thinking in terms of the applicability of what we were doing in New York to conditions in many regions of Canada which are far from comparable. For this reason we do not judge him too harshly and I am inclined to take a more charitable attitude because of this consideration.

Former Secretary Robert A. Wells felt that this communication should be sent to you so that you would know what your neighbor to the south was thinking regarding Dawson's report. I have full confidence that there will be no hard feelings and can assure you that we wish only to improve cooperation between our two countries and shall continue working to that end.

It would be splendid if we could see you, or one of your representatives, at the next Atlantic Waterfowl Council meeting in Richmond this month and I shall look forward to this pleasure. If I don't see you there, I am sure we can visit at Montreal.

With best wishes for a successful New Year,

Cordially yours,

ELC:B

(signed) E. L. Cheatum, Chief
Bureau of Game

cc.
A. deV
RAW

COMMENTS ON REPORT

Observations of Small Marsh Development in Upper New York State

by
J. B. Dawson

p. 1, par. 1 The 48-D program did not stem "from an anticipated post war recession and work shortage." The 48-D program developed from a known need for game habitat development on private lands where the majority of game production occurs. Food and cover plantings (shrubs and trees) and fencing were the first phases of the program in 1948. Small marsh development was added in 1949 as a multiple purpose habitat improvement technique to benefit waterfowl, furbearers, and upland game. The program was able to be expanded considerably because of the larger amounts of Federal Aid funds which became available and because it was obvious that this type of habitat restoration program was the most productive and effective way of using these additional funds. There is no "Section 48-D of the Pittman-Robertson Act." It is Project W-48-D of New York's Federal Aid in Wildlife Restoration Program.

p. 1, par. 3 For the two year period 1949 (not 1948) to 1950 the project paid half the cost of the construction, but not to exceed $10. per acre with a maximum of $100. per marsh. In 1951 the project paid $50. (for the first acre and $25. for each additional marsh acre) up to a maximum of $250. per developed marsh, not "per developed marsh acre" as stated in the report. There is quite a difference.

p. 1, par. 4 The tampering of water control structures, non-posting and muskrat damage were minor problems on a few of the marshes constructed. The 48-D project (this is not an "Act") was amended in 1952 to allow for expansion of the program to secure the desired quantity of units and to give the Department more adequate control (for management) of the areas for a longer period of time.

The last sentence of this paragraph is entirely without foundation. No such limits have been established. Certain operating standards were established as a guide to eliminate the more expensive sites. These limitations were based on size of watershed, size of flooded area and cubic yards of fill required per acre of marsh.

Muskrat damage continues to be a problem and considerable effort has been expended in finding ways and means of eliminating or reducing it.

p. 1, par. 6 The areas are posted by the Department against hunting. Trapping (by the landowner) is allowed and fishing (by the landowner) is allowed from June 15 to Oct. 1 only to allow for non-harassment of nesting (spring) and resting (fall) waterfowl.

p. 1, par. 8 Most marshes are located on lands unsuitable for crops or pasture. It would be absurd to ask a landowner for his tillable lands for this type of wildlife use. Nevertheless, the low wet spots where marshes are generally located some times contain the best soils in the area through run-off and siltation and not being cropped out.

p. 2, par. 9 The Lake Plains (Clay Plains?) of Erie and Niagara are made up of the more fertile soils in New York State including many of the marsh sites in those areas. In general we have found most landowners interested in the program - not just absentee, or individuals who do not crop their lands.

p. 2, par. 13 Impoundments, other than the run-off type, or spring fed, usually involve costly water control structures and are not, in general, considered feasible in the program.

p. 3, par. 14 The limit of watersheds is a maximum of 400 acres for standard design marshes. Special engineering approval is possible for plans with larger watersheds.

p. 3, par. 18 The construction costs on the larger marshes is much higher than on the small marshes. Also, the waterfowl utilization (nesting) cannot compare, on an acre for acre basis, with the small marshes. The utilization of the small areas for nesting is much greater. Resting and feeding are probably equal, large marsh against small marsh, on a per acre basis.

p. 3, par. 19 Productivity of the small marshes not only appears to be greater but due to the much greater proportion of shoreline per acre of water area they provide more nesting sites per acre than the large marshes. Species tolerance does not appear to be an important limiting factor, especially with the use of the pot hole program in conjunction with small marshes and the fact that intra-species tolerance allows nesting close together by different species. Migrating ducks do use the areas to a considerable extent. Shooting, even on unposted units, is limited to the first day or two and the birds leave. Production of waterfowl is the basis for the program, not public shooting on the areas. Public shooting is helped on the larger areas by feeding in waterfowl produced on the small areas. The basis for any waterfowl production program is to provide additional shooting opportunities for the hunter.

<u>p. 3, par 20</u> Site selection is of utmost importance and more emphasis is to be placed upon it as research and experience point the way.

<u>p. 4, par. 28</u> Dikes are built with at least one foot of differential between the top of the concrete drop inlet and the base of the emergency spillway. Design depth of flow in the emergency spillway is variable with a maximum depth of two feet in hardpan soils. A minimum of one foot of freeboard is always provided between maximum high water level and the top of the dike. In order to reduce costs it is always endeavored to design the dike at the lowest possible height contingent with safety.

<u>p. 4, par. 31</u> Dike upkeep has not presented a major problem in marshes contracted up to 5 years. Muskrat control is essential and general maintenance of the dike is required at intervals. Many artificial ponds in N.Y.S. constructed 50 years ago with ensuing muskrat damage, trees and brush on the dike are still serving their purpose adequately. The same maintenance is also required on dikes of the large impoundments.

<u>p. 4, par. 32</u> Muskrat damage is a problem but thus far has not been considered impossible to alleviate or that we should hold up the program until methods of control are developed. The same problem also exists on large areas such as the Schmitt marsh.

<u>p. 5, par. 34</u> See memo from A. S. Taormina attached.

<u>p. 6, par. 36</u> You might call it antagonism - there is certainly room for improvement. See also memo from ATS.

<u>p. 6, par. 37</u> We do not advocate "drawdown" on an annual basis. Drawdown every fourth or fifth year may be necessary to maintain soil conditions necessary for proper aquatic plant growth. Marshes managed on an annual "drawdown" must be capable of reflooding in the fall and are for <u>food production</u> only, whereas our objective is to manage for <u>duck production</u>.

<u>p. 6, par. 38</u> Engineering standards require only an 8' top width of dike. It appears that the particular case mentioned is an exception in that the engineering standards were exceeded during construction. We employ engineers for the purpose of obtaining adequate and substantial structures and we believe they have good reasons for applying certain safety factors in designing dams.

p. 6, par. 38a The cost of building small marshes is high when considering all overhead and incidental costs. It is estimated to cost about $250.00 per marsh acre developed. Actual construction costs probably average $150.00 per acre with surveying, designing, leasing and other miscellaneous expenses making up the difference. However, we feel that the productivity of these marshes justifies the cost. There are no rigid cost limitations imposed by the 48-D project (not Act).

p. 6, par. 39 This increase in cost is not due so much to the inefficiency of the bulldozer as to the simple mathematical fact that by increasing the height of a dike by 50% increases the total amount of earth fill (cubic yards) by 100%.

p. 6, par. 40 Most of our small marshes have some woods and brush cover and we are not aiming entirely for grass land type ponds for mallards. Woody cover probably limits utilization by certain species (mallard, blue-wing teal) to a much greater degree than herbaceous cover limits use by wood and black ducks for nesting.

p. 7, par. 42 The report states "Various elements are deposited by runoff water, but none are withdrawn" and is not correct. It is true there seems to be a deposition of plant food elements in marsh soils and thus an accumulation. We are sure that some of these elements remain water borne and are carried away by overflow. Also, present indications are that "age" of the pond may or may not control or influence O_2 concentrations.

p. 7, par. 44 There is nothing to substantiate that complete drainage is necessary. Partial drainage or natural drawdown are sufficient in many cases to induce satisfactory growth of plants on whatever portion of the pond bottom that is drained. Our water control structures are usually capable of draining 75% of the pond and evaporation will often increase the drainage to 90% or more. (see also par. 37).

p. 7, par. 45 To the contrary, the majority of wildlife marshes have facilities for drawdown (see design sheet included in report). Only the potholes have no mechanical method of drawdown and natural drawdown seems to be accomplishing the purpose. Even if mechanical drawdown is not available the dikes on the potholes are so constructed that the dike could be opened and then filled again later for complete drainage if this becomes necessary.

Toronto, Ontario,
January 11th, 1955.

Mr. E. L. Cheatum, Chief,
Conservation Department,
Albany 1, New York,
U. S. A.

Dear E. L.:

I am delighted with your letter of January 7th and enclosures on the New York small Marsh Program.

As one who has yet to make the conducted tour to your projects the comments are a big help towards a proper perspective on your program. You should certainly not apologize when you have actually gone to some trouble to help us. I am confident that Mr. Dawson will be grateful. I wish someone had done as much for me on many occasions. He may yet wish to ask a few questions.

We hope to have a good representation at the Wildlife Conference in Montreal, and suppose that you, being even closer, will try to do likewise.

My regards to Mr. Wells, whom you describe as "former secretary." I hope that this does not mean that we shall not be seeing him.

Yours very truly,

CHDC:NN

C.H.D. Clarke, Supervisor,
Wildlife Management.

January 13, 1955.

Mr. E. L. Cheatum,
Chief, Bureau of Game,
Conservation Department,
ALBANY 1, New York.

Dear Cheatum:

Thank you for forwarding to me a copy of your letter to Doug. Clarke. Doug was good enough to send me the comments by your staff on Dawson's report.

I wish to emphasize that we are appreciative for all the trouble that was taken to straighten out certain discrepancies in the report. However, I should bring to your attention that it was prepared by a student who was just starting to feel his way into this problem, and based on only a four-day visit. The only reason why you received this report was that you asked me personally for it. I had no idea that you were going to give it such serious consideration. We had no intention of giving it wide circulation in Canada; it was simply meant as a routine intra-department report and not treated as a carefully scrutinized survey of your program.

It was unfortunate that we did not have the opportunity to discuss the overall program with Mr. Bradley. An interview with him might have eliminated certain rather biased impressions which were obtained from discussions with your field staff.

Regarding your comments, I wish to make the following remarks:

<u>p. 1, par. 4</u> We definitely received information from one of your Area Game Managers that the total allowable cost on certain marsh developments in his district was not to exceed $500.00.

<u>p. 1, par. 8</u> We were actually taken to at least three sites on level land, land classes I - III, which were, in our opinion, quite productive agricultural lands. We were surprised that this was allowable, considering the increasing scarcity of good agricultural land.

<u>p. 4, par. 31</u> It was stressed by several Area Game Managers that dike upkeep presented a major problem.

p. 7, par. 44 & 45 It was pointed out to us on two occasions that as complete draw-down as possible is necessary to aerate the soil. It was also indicated by field men that in order to meet such drainage requirements, most dikes would have to be re-engineered.

I sincerely hope that any of the remarks made are not causing any embarrassment to your staff members, who were so very cooperative in explaining your program to us. I wish to express my personal thanks for your kind efforts to get us up-to-date, and I only regret that Dawson's report caused you further trouble.

Yours very truly,

A. deV/ae

A. de Vos,
Lecturer in Wildlife Management.

cc: Dr. Clarke

State of New York
Conservation Department
Albany 1, New York

January 14, 1955.

Dr. C. H. D. Clarke,
Supervisor,
Wildlife Management,
Department of Lands and Forests,
Toronto, Ontario.

Dear Doug:

I was very happy to receive your January 11th letter and your kind comments regarding our report to you giving our version of Mr. Dawson's report on New York's Small Marsh Program.

I shall be looking forward to seeing you at Montreal.

Cordially yours,

ELC:B

E. L. Cheatum, Chief,
Bureau of Game.

STATUS OF MOOSE IN TWEED DISTRICT, 1954.

by
H. G. Lumsden

Moose numbers were again discussed with trappers at the spring meetings this year, and the entries on the trappers' returns were used to supplement the information gathered in conversation.

Only 50 trap-lines out of a total of about 175 have moose living on them for most of the year, and these all lie in the northwestern quarter of the District. Only 18 of these trappers have reported every year on the status of their moose since checking began at Tweed in 1952. The total number of animals reported by them has been as follows:

1952	1953	1954
77	76	60

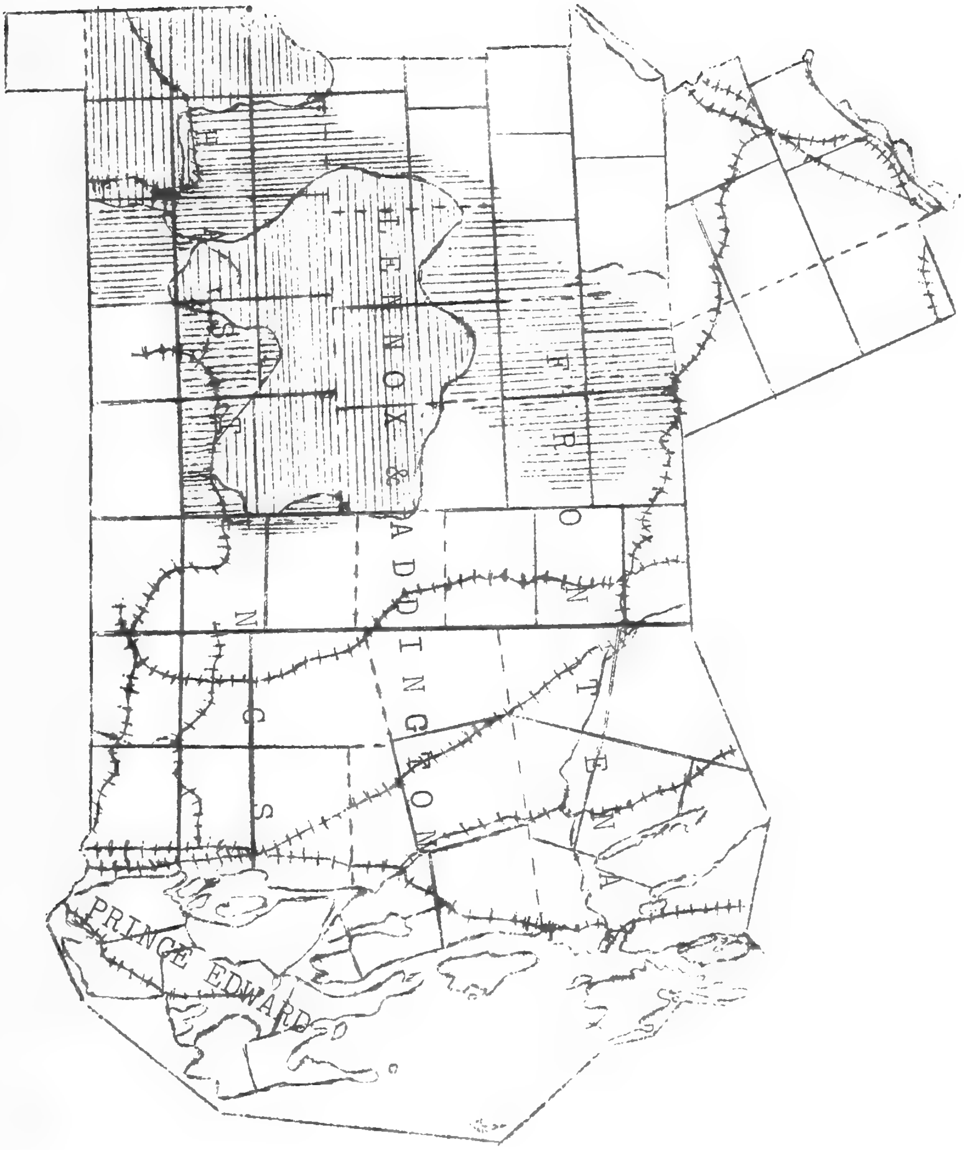
The drop in these moose totals in 1954 is thought to be due to the greater thought and care that trappers are putting into their estimates and not to an actual decrease in moose. Many of these trappers reported an increase in moose numbers on their lines while actually giving a lower numerical estimate.

The following table gives the status of moose as reported by some trappers for 1953 compared with 1954.

	Increase	Same	Decrease
1953	9	12	1
1954	10	5	3

That moose are extending their range in the District is supported by the fact that six trappers who have never had moose on their lines before reported their presence during the past year.

TWEED
DISTRICT



Plan Showing
Status of Moose - Tweed District, 1954

▥ Permanently occupied range

▤ Casual

Miles
20 10 0 20 40

The following table gives the results of the trappers' interviews for the past three years.

	Trappers Interviewed	Trappers With Moose Wintering	Number of Moose Estimated
1952	103	26	106
1953	84	22	111
1954	91	19	116

The accompanying map gives the present range occupied by moose in Tweed District.

SURVEY OF HUNGARIAN PARTRIDGES IN THE NEW LISKEARD FARMING DISTRICT,

FEBRUARY, 1955.

by
W. L. Sleeman

(Text of correspondence to Dr. C. H. D. Clarke
Feb. 24, 1955)

Further to our radiogram of February 21st, we wish to advise you that a survey of Huns was carried out in the New Liskeard Farming District.

The following birds were located:

(1) Flock of fifteen near McCool

(2) Flock of ten near Milberta

(3) Two flocks of seven near Thornloe

Most of the farmers interviewed claimed they had seen Huns occasionally before Christmas. Very few birds were seen afterwards, except for the flocks mentioned above.

The weather conditions in this area have been favourable to date; the snow fall was fairly heavy but there has been no crust to hamper burrowing.

During the past years when the crust was heavy Huns would congregate near farm buildings, where farmers would feed them.

In your letter of February 10th 1955, we note that by having rural snow ploughs deliberately expose green grass on the road shoulders Vitamin A could be made available from said grass.

We would like to point out that grass is exposed on most concession roads in the Hun range here.

We have no explanation for the falling off of population.

We had reports of numerous road kills before Christmas. Predators in the form of foxes are plentiful. The hunting pressure was very light.

ADDITIONAL NOTES ON THE ABUNDANCE OF WILLOW PTARMIGAN IN NORTHWESTERN ONTARIO, 1952-1953.

by
A. T. Cringan

A report on willow ptarmigan was prepared on July 4th., 1952,* at the request of C. D. Fowle, of the Division of Research. Since then, some more information about this species has been collected, which forms the content of this report.

Fort Severn: During the summer of 1952, J. Macfie and R. Moir saw a pair of adult willow ptarmigan with a brood of six young, on the coastal flats near the mouth of the Severn River. They also saw one pair and one single bird near the mouth of the Goose River.

Fort Severn Indians reported a moderate kill of ptarmigan in 1952-53, and considered the birds present in average numbers. A definite increase in numbers seems to be indicated by these reports.

Winisk: According to Mr. Robert Cooke, of Iroquois Falls, ptarmigan were abundant at Winisk during the winter of 1932-33.

Indians in the Winisk area reported ptarmigan as present in average numbers during the winter of 1952-53. This again indicates an increase over the 1951-52 population level, when they were considered to be scarce.

Big Trout Lake: Residents report that ptarmigan were plentiful in the Big Trout Lake area from November 15th., until December 15th., 1952, then decreased sharply, and remained present in small numbers throughout the winter. One person estimated that 65 or more ptarmigan were killed within two miles of the village in the fall. Again, reports indicate an increase during the past year.

Lansdowne House: A moderate flight occurred into the Lansdowne House area. Specimens acquired in March were turned over to the Royal Ontario Museum, H. G. Lumsden, and various District Offices of the Department of Lands and Forests.

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* See Fish and Wildlife Management Report #7, October, 1952.

We have no information on the past status of ptarmigan in this area.

Big Beaverhouse Lake: A light flight occurred into the Big Beaverhouse area. Mr. Wm. Gordon saw three ptarmigan there in November, but knew of no other records. Difference since 1951-52 should be recorded as no change, since very few were reported during that winter.

Fort Hope: Two ptarmigan were seen near the post by J. Brisson in November. This is the only 1952-53 record reported for this area.

Ogoki: No ptarmigan were seen in 1952-53 up until early January. This is a decrease in numbers from those present in 1951-52.

Sandy Lake: The 1952-53 ptarmigan flight into the Sandy Lake area consisted of scattered small flocks. This appears to be a heavier flight than that in 1951-52.

Deer Lake: No ptarmigan reported in 1952-53.

Round Lake: No ptarmigan reported in 1952-53

Summary and Comment

Increased ptarmigan populations were present in 1952-53 in the Severn, Winisk and Big Trout Lake areas. The entire area covered by the 1952-53 flight extended into the Sandy Lake area in the west, Big Beaverhouse area centrally, and Fort Hope area in the east. Ptarmigan densities in these outlying areas were about the same as in 1951-52, except in the Sandy Lake area, where an increase occurred. The only area reporting a decrease is the Ogoki area, missed by this year's flight.

The over-all picture is definitely that ptarmigan are increasing. The main areas, Severn and Winisk, have now shown increases for the second consecutive year. This has been the third complete winter since the peak population of 1949-50 which induced flights as far south as Red and Casummit Lakes.

PRELIMINARY MOOSE MOVEMENT STUDIES, 1952.

by
A. de Vos and R. L. Pearson

A moose movement study was conducted on Little Missinaibi Lake in the Chapleau Crown Game Preserve during the periods July 2nd - July 21st, and August 2nd - August 5th, 1952. Data were collected on the sex and age ratio of the moose and their movements during the summer. Methods of marking moose were tested in order to aid in the recognition of individuals.

Little Missinaibi Lake is ideally situated for a survey of this type. The large area covered by numerous arms enables one to make extensive trips by canoe. The presence of a fairly recent burn near the southeastern section of the lake provides extensive feeding grounds for the moose in winter. This suggests that this section might be more heavily populated than the adjacent areas, which are covered mainly with sub-climax forests.

Field Observations

Observations of moose were obtained by travelling various arms of the lake by canoe regularly. Approximately half of the canoe travelling was done by paddling, and half by using a 2½ horse-power outboard motor. Such data as time of observation, and age, sex, and location of moose observed were recorded. Special peculiarities of individuals were noted. Bulls could be differentiated by such characteristics as deformities of antlers, the shape and length of the bell, and the relative age of the animal. Individual cows cannot be identified as readily as bulls. The shape of the bell and the relative age (adult, two year old or yearling) are the main distinguishing characteristics for cows.

Records were also kept of the weather, time spent in the field, and the distance travelled.

TABLE I - Sex and Age of Moose Observed*

Adult Bulls	Adult Cows	Two Year Olds		Yearlings		?	Cow With 1 Calf	Sex Unknown
		♂♂	♀♀	♂♂	♀♀			
24	18	5	6	5	4	1	6	2

* This table does not include animals which in the opinion of the observer were repeats.

The small sample indicates a high percentage of adult bulls as compared with cows. Observations which were considered repeats were excluded from Table I. It is not unlikely that a few repeats not recognized as such, occurred among the total of 66 animals observed. However, in the opinion of the observers this error is small. In total 17 animals, or 25% of the actual number of animals observed were thought to be repeats. This may indicate that only a relatively limited percentage of the total population was observed, as the number of repeats would have been greater if a higher percentage of the actual population had been observed. The seven cows which were recorded without calves, did not appear to have any progeny.

TABLE II - Correlation Between the Number of Moose Observed Per Hour and Time of Day.

Time Observed	Total No. of Moose Observed	No. of Hours in Field	No. of Moose Observed Per Hour	No. of Moose Observed Per Hour During Three Hourly Periods.
5- 6	1	2	.50	
6- 7	2	3	.67	
7- 8	3	4	.75	.30
8- 9	0	10	0	
9-10	2	37	.054	
10-11	4	37	.11	.071
11-12	2	38	.053	
12- 1	3	33	.091	
1- 2	6	33	.18	.15
2- 3	5	27	.19	
3- 4	7	21	.33	
4- 5	8	17	.47	.32
5- 6	1	12	.084	
6- 7	7	11	.64	
7- 8	9	11	.82	.60
8- 9	4	12	.33	
9-10	2	3	.67	

The sample shown in Table II is too low for statistical analysis. Data were pooled into three hourly periods in order to see whether there might be obvious differences in the number of moose observed per hour during different times of the day. Data seem to indicate that the highest number of observations can be obtained during the evening, and the least during the middle of the day.

However, it should be pointed out here that less efforts were made to visit likely spots where moose could be observed during the middle of the day than either early morning or evening. One moose was observed per 4.7 hours of field work and per 9.2 miles travelled. The latter figure was arrived at by adding up the total mileage for each day travelled and dividing this by the number of moose observations.

The longest period during which any one animal was observed was from June 21st until July 15th.* This was an old bull which could be recognized by the fact that the outer rim of the left antler appeared white, possibly the result of rubbing or accidentally injuring the antler. This animal was not noticed between June 22nd and July 12th, although daily visits were made to where it was seen first. In that time interval it may have left the lake entirely. Except for the July 12 observations, this animal was noticed in a restricted area of only a few hundred square yards. On July 12th it was observed about $\frac{3}{4}$ mile east of this location.

Table III lists the moose which were observed more than once, as well as the date, the hour and site of observation.

In all 6 cows with calves were observed. Table IV shows the date and hour that these moose were observed, as well as some particulars. In the opinion of reporters these represent all different cows with calves.

Map I** shows the distribution of moose based on observations. Lines interconnecting sites of observation indicate how animals which were observed more than once may have travelled. The distribution of localities where suitable aquatic food plants are present to attract moose into the water, is also indicated. Most moose observations are concentrated around these spots. Whether the animals are mainly attracted by the aquatic vegetation is a debatable point. However, the majority of the animals observed were feeding or were disturbed in that activity.

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* Possibly until July 21st when a large bull was sighted in the same location from the aircraft.

** A large scale map accompanied this report.

Well travelled moose trails, as indicated on the map, were generally observed near good feeding grounds, also indicating a concentration of moose around these areas.

Table V shows the relationship between the period of observation and moose observed per hour from June 13 - August 5. No change can be noticed in moose observations as the season progresses.

Weather data were kept. No correlation can be established as yet between the number of moose observations and weather conditions.

TABLE III - Moose Observed More Than Once.

Date	Time	Observation Site	Recognition Marks
Mature Bulls			
1. June 21	Noon		Old bull, outer rim of left antler whitish, whitish streaks on same antler. Antlers well developed.
2. June 22	Afternoon	Same location as 1st observation.	
3. July 12	4.00 p.m.	$\frac{3}{4}$ mile E. of 1st observation.	
4. July 12	7.45 p.m.	Same location as 1st observation.	
5. July 13	10.20 a.m.	"	
6. July 13	4.20 p.m.	"	
7. July 14	6.00 p.m.	"	
8. July 15	9.30 p.m.	"	
1. July 3	9.30 a.m.	"	Two prongs joined on right antler.
2. July 3	2.30 p.m.	"	
1. July 15	7.50 p.m.	"	Two prongs joined on right antler. Different prongs than in case of preceding moose.
2. July 16	4.30 p.m.	"	
1. Aug. 3	3.15 p.m.	"	Relatively young bull, antlers not very well developed as yet.
2. Aug. 4	7.00 a.m.	"	

Date	Time	Observation Site	Recognition Marks
Yearling Bulls			
1. July 14	12.15 p.m.	"	
2. July 15	8.45 p.m.	"	
Two Year Old Bulls			
1. July 6	10.30 a.m.	Same location as 1st observation.	Spike horn, body size too large for yearling.
2. July 6	10.45 a.m.	1/4 mile northeast of location of 1st observation.	
1. July 16	8.45 a.m.		Forked antlers slightly developed.
2. July 16	8.45 p.m.		
3. July 18	2.20 p.m.	1/4 mile W. of location of 1st observation.	
Mature Cows			
1. July 19	6.00 a.m.		Bell 8-10" long.
2. July 19	6.00 p.m.	Same location as 1st observation.	
Yearling Cows			
1. July 11	3.20 p.m.		
2. July 15	7.45 p.m.	1 mile N. of location of 1st observation.	Bell about 4" long.

TABLE IV - Cows with Calves.

(1)	June 22	7.30 p.m.	Calf painted white.
(2)	June 29	Noon	Calf 6 weeks.
(3)	June 30	9.00 a.m.	
(4)	June 30	11.30 a.m.	Calf tagged.
(5)	July 5	2.10 p.m.	Young cow.
(6)	July 6	10.55 a.m.	Calf 3 weeks old.

TABLE V - Relationship Between Period of Observation and Moose Observed.

Date	No. of Hours in Field	No. of Moose Observed	No. of Moose Observed Per Hour
June 13-19	28	1	.039
June 20-26	29	10	.39
June 27-July 3	48	14	.29
July 4-10	78	16	.21
July 11-17	71	22	.31
July 18-24	25	7	.28
Aug. 2- 5	23	8	.35

Marking Techniques

In the summer moose travel definite trails regularly to and from feeding areas situated in shallow bays of the lake. "Paint traps" were located on these runways in an effort to mark as many individuals as possible, to enable more definite identification.

The following methods were tested for marking moose:

Method I

A metal tray (A) (see fig. 1) is fastened to a pole (B) which is supported at (E) and (E^1), allowing pole (B) to rotate freely. A crosspiece (C) is fastened to one end of (B) parallel to the ground. A string attached to a nail in (C) runs down to a tree through a staple (D) and then crosses the trail and is tied to another tree. This string is situated at such a height that moose of various ages, excluding calves, will trip it, but not deer or wolves. When a moose pushes against the string, arm (C) is rotated in the direction shown by the arrow, and pan (A) is tipped releasing its contents.

This method is mechanically practical, but the paint in the pan, which is exposed to the air, rapidly settles and a crust forms in one to two days. This means that the traps must be visited frequently and refilled with fresh paint, making the method both wasteful and expensive. In all six moose were marked, or at least tripped the trays, as evidenced by paint rubbed onto leaves and twigs along moose trails. None of these marked animals were observed.

Method II

The trap operates on the same principle as described in method I. A plastic bag is filled with paint and tied securely to a fixed pole (F) (see fig. 2). A stick (G), about one foot in length, is nailed to rotating pole (B). A razor blade is attached to one end of (G). When tension is applied to the string, (B) is rotated and (G) rises upwards, cutting the bag and releasing its contents. Pole (F) is on the opposite side of the tree of pole (B), allowing paint to fall freely, missing (B).

This method seems more suitable than method I, as air is excluded from the bag and the paint remains fluid for several weeks. Only two traps have been tried so far for the period of one week. No moose tripped these traps.

Method III

An effort was made to tag and paint newly born calves. Two of them were captured while swimming. One was tagged with an ear tag, and one marked with paint.

Discussion and Summary

(1) The number of moose observed per day amounts to around two, which is not high. The number of observations can possibly be increased when more travelling is done by using an outboard motor between locations where moose are likely to occur. However, moose are at times more alerted by an engine, and this may result in less accurate observations of individuals.

(2) Data obtained so far indicate a high ratio of bulls as compared with cows. The observation of six single calves and seven cows without calves, indicates a rather poor reproductive success as compared with findings in Sweden.

(3) Twenty-five percent of the actual number of moose observed were thought to be repeats. This may indicate that only a relatively limited percentage of the total population was observed.

(4) Evening hours, between 6-9 p.m., appear to be most suitable and midday hours least suitable for moose observations.

(5) The longest period during which a moose (an old bull) was repeatedly observed was 24 days. He was not seen between June 22nd and July 12th, when he appeared to have left the lake.

(6) The distribution of moose observed coincides largely with the distribution of suitable feeding areas of aquatics.

(7) Moose observations did not appear to decrease in frequency as the season progressed.

Recommendations for Future Study

(1) It is recommended that this movement study be undertaken again next year, as obviously only limited results and conclusions can be obtained from such a restricted study, as was made. The number of moose observations compares favourably with those made on Big Island. Although the number of observations per day is small, it might be advisable to concentrate on relatively few moose whose movements can be traced, rather than many.

(2) A definite effort should be made to find a paint which sticks to hair, even if it is wet.

(3) Data should be obtained on which percentage of the animals were observed feeding on aquatics, and on which species.

(4) At least two men are needed to carry out the project. It should commence about the first of June and terminate around August 15th.

(5) A 2½ H. P. outboard motor and a 16' canoe should be made available to the project.

FIGURE I

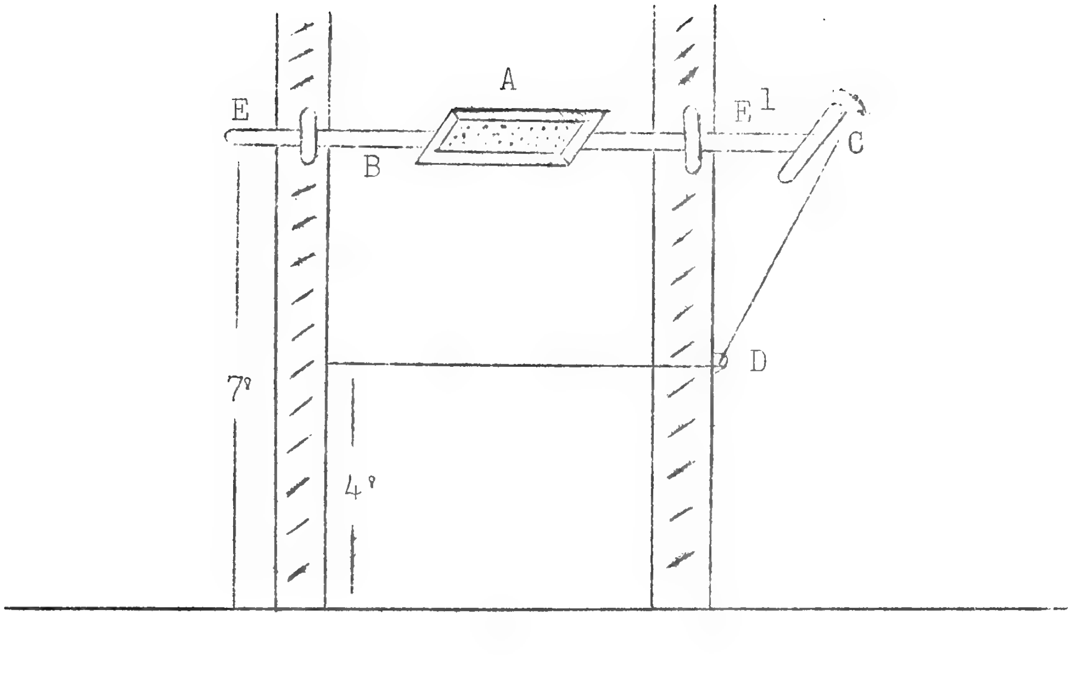
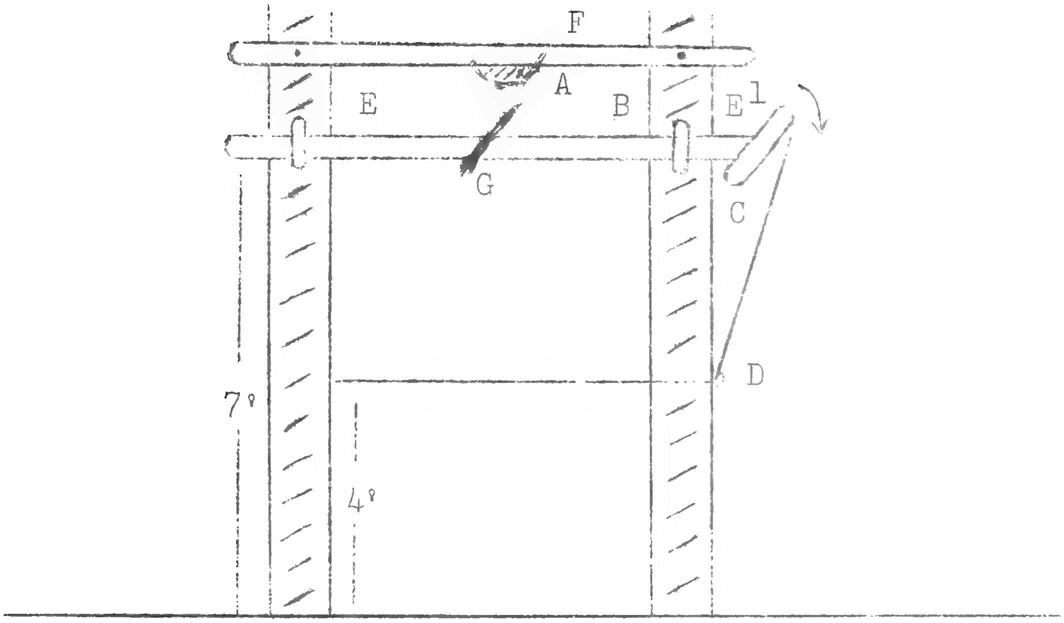


FIGURE II



WATERFOWL NOTES FROM WHITEFISH BAY, LAKE OF THE WOODS.

by
J. Carswell

The following notes were taken on a course from Sioux Narrows south along the east shore of Whitefish Bay to Turtle Lake thence north along the west shore of the bay to Belle Island, July 5, 1955.

Species	No. of Broods	No. of Young	Average Brood Size
American Merganser	3	28	9.3
Ring-necked Duck	2	9	4.5
Golden-eye	11	48	4.4
Mallard	6	58	9.7
Unidentified	8	38	4.7

The distance covered in this survey was forty miles.

ADDITIONAL AGE AND GROWTH RATES OF ONTARIO FISH -- BLUEGILL (*Lepomis macrochirus*) and Black Crappie (*Pomoxis nigro-maculatus*)

by
O. E. Devitt

Where these two pan fish occur in the province they provide the angler with excellent sport. Both inhabit warm, weedy lakes, ponds and streams. Both have similar ranges being found in the drainage systems of Lakes Ontario, Erie and St. Clair, the St. Lawrence River and in many of the Rideau Lakes. The Black Crappie also occurs in Lake of the Woods. The ages of the following fish have been determined by the scale method.

Bluegill

Lower Beverley Lake, Rideau District

Collector -- N. D. Patrick
Date - November, 1952.

Age Group	No. of Fish	Average Total Length (ins.)	Length Range
IV	10	5.4	(5.0-6.0)
V	15	5.9	(5.7-6.5)
VI	14	6.5	(6.0-7.0)
VII	15	6.9	(6.2-8.2)

Upper Beverley Lake, Rideau District

Collector -- N. D. Patrick
Date -- November, 1952.

Age Group	No. of Fish	Average Total Length (ins.)	Length Range
II	1	5.2	-
III	16	6.0	(5.2-6.6)
IV	10	7.1	(6.7-7.6)
V	3	8.0	(7.9-8.2)
VI	3	8.7	(8.5-9.0)

Lake Whittaker, Lake Erie District

Collector -- A. H. Berst
Date -- September, 1951.

Age Group	No. of Fish	Average Total Length (ins.)	Length Range	Average Weight (grams)	Weight Range (grams)
II	5	3.8	(3.4-4.2)	15.4	(10.1-21.8)
III	6	5.2	(4.3-5.9)	45.1	(33.5-63.2)
V	1	7.4	-	145.2	-

Rondeau Bay, Lake Erie District

Collector -- A. H. Berst
Date -- February 3, 1954.

Age Group	No. of Fish	Average Fork Length (ins.)	Length Range
V	1	7.0	-
VI	5	8.4	(8.0-8.7)
VII	4	8.8	(8.7-9.0)

Black Crappie

Lake Whittaker, Lake Erie District

Collector -- A. H. Berst
Date -- September, 1951.

Age Group	No. of Fish	Average Fork Length (ins.)	Length Range	Average Weight (grams)	Weight Range (grams)
II	4	5.3	(4.7-5.7)	39.5	(25.9-47.2)
III	4	7.1	(7.0-7.2)	101.0	(97.4-110.0)
IV	1	8.1	-	169.4	-
VI	1	10.7	-	241.6	-

Rondeau Bay, Lake Erie District

Collector -- A. H. Berst
Date -- February 3, 1954

Age Group	No. of Fish	Average Fork Length (ins.)	Length Range
VI	1	9.7	-
VII	2	10.8	(10.7-11.0)
VIII	12	11.4	(10.7-12.0)
IX	1	12.0	-
X	2	12.9	(12.7-13.2)

Oakland Creek, Lake Huron District

Collector -- J. F. Gage
Date -- May 12, 1953.

Age Group	No. of Fish	Average Fork Length (ins.)	Length Range	Average Weight (grams)	Weight Range
III	8	6.8	(5.9-7.3)	69.7	(43.9-79.5)
IV	2	8.0	(7.9-8.0)	108.2	(107.5-109.0)

Devil Lake, Bedford Township, Frontenac County

Collector -- K. K. Irizawa
Date -- May 9-18, 1954.

Age Group	No. of Fish	Average Fork Length (ins.)	Length Range	Average Weight (ozs.)	Weight Range (ozs.)
IV	1	9.5	-	4.0	-
VI	10	11.4	(11.0-12.0)	5.1	(4.0-8.0)

A COMPARISON OF THE RATE OF GROWTH EXHIBITED BY THE PROGENY OF HATCHERY REARED SPECKLED TROUT AND LAKE NIPIGON WILD TROUT RETAINED AT THE DORIAN REARING STATION, 1950.

by
G. C. Armstrong

Introduction

The renovation of the Dorian Rearing Station and the subsequent re-stocking of the hatchery with the progeny of two strains of speckled trout, namely, hatchery reared speckled trout from the Hill's Lake Provincial Hatchery and wild trout from Lake Nipigon, afforded an excellent opportunity to study one phase of the controversial topic of, hatchery trout versus wild trout.

The following report will describe and compare the rate of growth of a selected potential breeding stock from these two strains of trout at the age of 20-21 months.

History

The potential breeding stock of approximately 30,000 Hill's Lake trout and 3,000 Lake Nipigon wild trout was selected during the course of rearing the original stock of approximately 800,000 Hill's Lake trout and 330,000 Nipigon wild trout for distribution in the fingerling and yearling stages. As the fish developed considerable variation in the rate of growth within each group necessitated sorting to prevent excessive cannibalism and to permit proper care. In conducting these operations the largest fish in each group were selected and segregated to form the present breeding stock.

During the course of development the two strains of fish were cultured in a similar manner. The feeding, sorting and general management was conducted on a comparative basis whenever possible. Both groups of fish were reared to the fingerling stage on beef liver before being introduced to a variable mixed diet, dependent on the availability, of beef liver, hog spleen and rolled oats. The sorting and general management received the undivided attention of the hatchery staff and no significant difference in the care of either group could be attributed to the cause of any variation in the resultant growth rate.

Method

Three hundred trout of each group were weighed and measured during the examination. The trout were anesthetized in a one percent ether solution to reduce the possibility of injury through handling and to permit a more accurate examination. The fish were measured for total length and standard length (tip of the snout to the end of the vertebral column) to the nearest eighth of an inch and were weighed in groups of five in water on a Fairbanks-Morse beam scales.

The sex of the fish was also considered during the examination. The Hill's Lake trout had been previously segregated for spawning purposes and presented no problem in collecting a random sample of 150 fish of each sex. The Lake Nipigon progeny, however, were not separated owing to the extreme difficulty encountered in sexing the fish, therefore, during the course of the measuring and weighing procedure, the writer identified as many fish as possible for further analysis of the growth studies. A total of 78 fish, 60 females and 18 males, were identified during the exercise.

Results

The Hill's Lake hatchery stock proved to be much the larger of the two strains of fish. The average total length of the former was more than one inch greater than the Lake Nipigon progeny and the average weight of the domestic stock almost doubled the weight of the wild trout. See Table 1.

A comparison of the average, maximum and minimum rates of growth for each sex in the two groups is described in Table II. Although these measurement are not strictly comparable, due to the limited number of wild trout identified, they do, nevertheless, provide some indication of the trend in the rate of growth between sexes.

Discussion

Such a report would not be complete without including some remark on the general behaviour of the two strains of fish. From the earliest development of the young fingerlings a marked contrast readily distinguished the two groups of fish. The Lake Nipigon trout appeared to inherit their wild instincts while the hatchery reared fish were more docile and domesticated in their reactions.

Just how much these inherent qualities effect the rate of growth of the two groups of fish would be

difficult to assess, however, the writer is of the opinion that these characters are probably the principal factor in the variation of the rate of growth between the two groups of fish.

Conclusion

(1) The rate of growth exhibited by the progeny of hatchery reared speckled trout is considerably greater than that of Lake Nipigon wild trout cultured under similar conditions.

(2) The first generation of hatchery reared Lake Nipigon wild trout, up to the age of 20-21 months, display a distinct wildness not exhibited by the progeny of hatchery reared trout.

Recommendation

(1) That the rate of growth studies to be continued, on a yearly basis, on the two strains of parent fish in order to complete the picture on this aspect of fish culture.

(2) That the two strains of trout be interbred and that the rate of growth be determined for the progeny.

(3) That related subjects such as, mortality, hardiness (disease), degree of fertility etc. be considered in conjunction with the rate of growth studies.

(4) That some effort be made to determine the rate of mortality, percentage return and rate of growth of these two strains of fish following their release in a natural environment.

Table I - A Comparison of the Average Rate of Growth Exhibited by the Two Strains of Speckled Trout.

Strain	Number Examined	Average Total Length	Average Standard Length	Average Weight
Hill's Lake Hatchery Stock	300	8.85	7.46	3.24
Lake Nipigon Wild Stock	300	7.32	6.11	1.87

Note: Length and weight measurements are described in inches and ounces.

Table II - A Comparison of the Rate of Growth Exhibited by the Males and Females in the Two Strains of Speckled Trout.

Measurement	Hill's Lake Hatchery Stock		Lake Nipigon Wild Stock	
	Males (150)	Females (150)	Males (18)	Females (60)
Average:				
Total Length	9.30	8.40	8.16	7.45
Standard Length	7.88	7.04	6.84	6.21
Weight	4.61	3.24	not determined	
Maximum:				
Total Length	12.375	11.500	9.125	8.625
Standard Length	10.625	9.875	7.625	7.250
Minimum:				
Total Length	7.375	6.625	6.875	6.000
Standard Length	6.125	5.375	5.625	4.875

Note: (a) Numbers in brackets indicate the number of specimens examined.

(b) Length and weight measurements are described in inches and ounces.