

A STUDY OF THE TERRITORIES OF THE RED-EYED VIREO
(VIREO OLIVACEUS) ON GRAPEVINE POINT

by

Carlita Nessleringer
Staten Island, New York

A field study conducted at the
University of Michigan
Biological Station

August 13, 1949.

TABLE OF CONTENTS

	Page
Introduction.....	1
Acknowledgements.....	1
Scope of study.....	1
Environment.....	2
Flora.....	2
Avifauna.....	2
Method.....	3
Observations.....	3
Discussion.....	5
Summary.....	7
Literature Cited.....	9
Map	

This study of the territories of the Red-eyed Vireo, (Vireo olivaceus, Linnaeus), was made at the University of Michigan Biological Station at Douglas Lake, Cheboygan County, Michigan, during the summer of 1949.

I wish to acknowledge the guidance of Dr. Olin Sewall Pettingill, Jr. of the University of Michigan Biological Station in directing the course of the work. I am also grateful for his advice in the preparation of the manuscript.

An area 600 meters in length and averaging 75 meters in width was kept under observation from June 29 to August 6. This strip of land follows the western shore of South Fishtail Bay, Douglas Lake, and observations were made largely from the Grapevine Trail which runs parallel to the shoreline (see map).

The lower peninsula of Michigan is generally a region of transition between coniferous and deciduous trees with the result that forested areas of both types of vegetation occur. On Grapevine Point, aspens (Populus grandidentata) are present due to burning and clearing within the last 50 years. Hardwoods are invading, and a young maple forest is dominant in the northern portion of the point. In this portion, the trees of Acer saccharum and A. rubrum form

a 30- foot stand. At the south end of the Point aspens are dominant. These reach a height of 50 feet. Below the crowns of the aspens, maple saplings are gaining a hold. Other characteristic trees of the area as a whole, include paper birch (Betula papyrifera), beech (Fagus grandifolia), ash (Fraxinus americana), red oak (Quercus borealis), and striped maple (A. pennsylvanicum). A few hemlocks (Tsuga canadensis), and some white pines (Pinus strobus) are present in the area.

The forest floor is open and has a leafy cover. In the aspen dominated area, some shrub growth occurs. The principal shrubs include the red-osier dogwood (Cornus circinata), the June-berry (Amelanchier canadensis), and sumac (Rhus glabrus borealis). Ground plants are principally the bracken fern (Pteridium latiusculum), and wintergreen (Gaultheria procumbens).

The avifauna in the environment of the Red-eyed Vireo on Grapevine Point includes the American Redstart (Setophaga ruticilla), Cedar Waxwing (Bombycilla cedrorum), Robin (Turdus migratorius), Ovenbird (Seiurus aurocapillus), Least Flycatcher (Empidonax minimus), Crow (Corvus brachyrhynchus), Blue Jay (Cyanocitta cristata), Song Sparrow (Melospiza melodia), Baltimore Oriole (Icterus galbula), Scarlet Tanager (Piranga olivacea), Wood Pewee (Contopus virens), Black-capped Chickadee (Parus atricapillus), Yellow-billed Cuckoo (Coccyzus americanus americanus), and

the Whip-poor-will (Caprimulgus vociferous).

A total of 56 hours was spent in the field locating singing perches of males, and observing flights, feeding habits and other activities of the Red-eyed Vireos. Equipment consisted of a pair of 7 X 35 millimeter Bausch and Lomb binoculars. Stations were established by placing wooden markers in the ground at 25 meter intervals. This was done along the Grapevine Trail for a distance of 600 meters.

Observations were made by walking along the trail until a Vireo was heard or sighted. The bird was observed with the intention of locating singing perches and following flights. Such data were then plotted, using as coordinates, distance from the station and distance from the trail in meters. When all locations were plotted on a composite map, the territories were outlined following the method of Kendeigh (1944).

OBSERVATIONS

That territorial relationships exist between individuals of a species was clearly demonstrated by the Red-eyed Vireos along the Grapevine Trail. Points where vireos were observed tended to aggregate into groups which were interpreted as territories. Outlining these points yielded a total of 12 territories along the 600 meter length studied. Territories were found to average 0.8 of an acre. Territory boundaries in some cases were found to meet but in no instance did territories overlap.

During the entire period of study, no active defense of territory by the male was observed. Proclamation of territory was evidenced by vigorous singing of males, often in the heat of day. However, singing occurred most persistently in the early morning. Singing perches were usually located about 30 feet above the ground in tall aspens, maples or birches.

The female Vireo is the active defender of the nest. In one instance when a young bird was taken from the nest daily for weighing the female hopped from branch to branch within three feet of the nest, scolding continuously with the Catbird-like call and intermittently snapping the bill, thus producing a loud click. The male was attracted to the nest by this disturbance, and although he scolded vigorously, his behavior was less aggressive in that he failed to approach the nest as closely as did the female.

Nests found included one occupied nest and four robbed or abandoned nests of the present year. In addition, three nests of the past year were found. The nest in territory B was located close to the south boundary. Both birds usually flew north or west when leaving the nest but were never seen more than a few feet to the south. On one occasion while the female was incubating and the male was vigorously singing in territory B, a pair of Vireos in territory A were observed feeding in a birch 12 meters south of the B nest. Another instance of nest building near a boundary was the incompleted nest in territory C

which was located in the crotch of a maple branch eight feet from the ground and only three meters from the water's edge. Territorial activity such as singing bore no apparent relationship to the location of the nest. Singing of the male did not occur particularly close to the nest.

Territorial maintenance occurred throughout the breeding season. The period of study began on June 29 when the first broods were well underway. In general, no decline in male singing activity was noticed between broods. On August 13 the males in some territories had stopped singing while others were singing vigorously. This indicates that when the second brood has been fledged and nesting activity is over, male singing ceases and territorial maintenance is over.

DISCUSSION

A comparison of this study with the work of Proffitt (MS 1946) in the same area showed that the nesting population was higher in 1949 than it was in 1946. Whereas ten territories were outlined in the 600 meter strip observed by Proffitt, 12 territories were found to occur in the same area in the present study. There was no close correlation between the territory sites in the two years. Only territories A and B in 1949 correspond fairly well with B and C of 1946. In practically no cases did the territories recorded by Proffitt extend as close to the water's edge as they were found to in this study. This may be due

to the fact that more data were obtained in 1949 which would permit a more accurate interpretation of territories according to the method of Kendelgh. In both studies, however, territories were found to cross the trail in almost all cases.

Proffitt reports the beginning of territorial disintegration around July 18. This was based principally on his assumption that the nesting cycle is over in the middle of July, since the last nest which he found containing young was empty by July 25. One brood, according to Proffitt, is "logical" for the area. Forbush (1929) states that occasionally a pair may raise two broods in a season, and Barrows (1912), writing about the Michigan region, feels that two broods seem probable.

The present study indicates that two broods are not uncommon. On July 27 a fledgling was seen in territory A. Singing of males was vigorous on August 4, which indicates territorial maintenance. On August 4, three fledged young in territory C were observed being fed. The male bird in the same territory was seen singing at this time. In the territory B nest the first egg was laid July 14. In another nest in the vicinity of the Biological Station the first egg was laid July 20. Judging from the dates, these were the second nestings of the season.

SUMMARY.

1. A study of the territories of the Red-eyed Vireo, (Vireo olivaceus, Linnaeus), was made under the direction of Dr. Olin Sewall Pettingill, Jr. at the University of Michigan Biological Station in Cheboygan County, Michigan, during June, July and August, 1949.
2. A plot 600 meters long and averaging 75 meters wide (11.25 acres) was observed on Grapevine Point, along the shore of Douglas Lake. Singing perches of males and behavior of the Vireos were observed and recorded in relation to stations established along the trail at 25 meter intervals.
3. The Grapevine Point area is a young maple forest with aspens and some shrubs present.
4. Outlining the groups of observed points of activity indicated the presence of 12 territories in the area studied.
5. Territories cover an average area of 0.8 acres and their boundaries may coincide. Territories do not overlap.
6. Singing served as a means of proclamation of territory.
7. No territorial defense on the part of the male was observed. On several occasions a female Vireo was observed

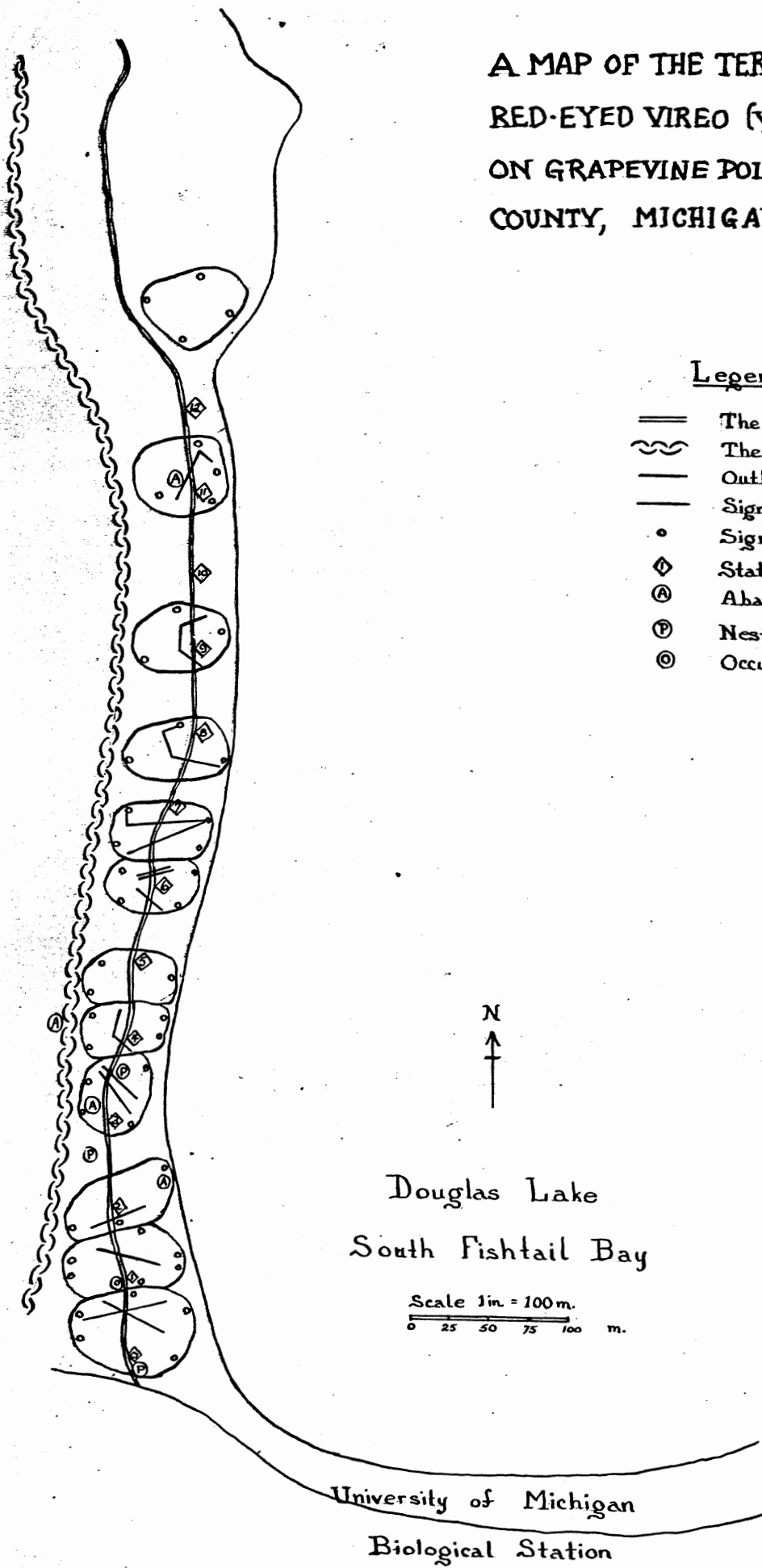
to defend the nest by emphatic scolding and bill snapping three feet from the nest and the intruder.

8. Nests found included one occupied and four abandoned nests of the present year and three nests of the preceding year. One nest was located three meters from the water's edge and another was very close to the boundary of it's territory.

LITERATURE CITED

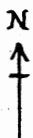
- Barrows, W. B.
1912 Michigan Bird Life. Michigan Agricultural
College, Lansing, Michigan.
- Forbush, E. W.
1925-29 Birds of Massachusetts and Other New England
States, Vol. 3, Massachusetts Department of
Agriculture, Boston.
- Kendeigh, S. C.
1944 Measurement of Bird Populations. Ecological
Monographs, 14:67-106
- Proffitt, M. A.
1946 Red-eyed Vireo Territories in a Thirty-Acre
Tract of Aspen-Young Maple Forest. Unpublished
report in Blanchard Laboratory.

A MAP OF THE TERRITORIES OF THE
 RED-EYED VIREO (VIREO OLIVACEUS)
 ON GRAPEVINE POINT, CHEBOYGAN
 COUNTY, MICHIGAN, 1949.



Legend

- == The Grapevine Trail
- ~ The ridge
- Outline of territory
- Significant flight
- Significant singing perch
- ◇ Station marker
- Ⓐ Abandoned nest
- Ⓟ Nest of preceding year
- Ⓞ Occupied nest



Douglas Lake
 South Fishtail Bay

Scale 1 in = 100 m.
 0 25 50 75 100 m.

University of Michigan
 Biological Station

A STUDY OF THE LIFE HISTORY
OF THE RED-EYED VIREO

by

Kathryn Ann Grave
Minneapolis, Minnesota

A field study conducted at the
University of Michigan
Biological Station

September 26, 1949

TABLE OF CONTENTS

	Page
Introduction	1
Scope of Study	1
Methods of Study	1
Acknowledgments	2
Environment	3
Ecological History of the Region	3
Flora of the Region	3
Climate of the Region	4
Avifauna of the Region	4
Fauna of the Region	5
Territory	6
Early Morning Song	11
Nests	13
Protection of Nests	17
Selection of the Nesting Site	18
Nest Building	18
Duration of Nest Building	18
Participation of the Sexes	20
Mechanics of Nest Building	22
Re-use of Old Nests	24
Egg Laying	25
The Clutch	29
Size of the Clutch	29
Description of the Clutch	29

	Page
Incubation	30
Duration of Incubation	30
Participation of the Sexes	32
Rhythm of Incubation	34
Behavior of the Sexes	38
Reactions to Intruders	40
Incubation at Night	42
Abnormalities of Incubation	42
Hatching	43
Newly Hatched Young	43
Development of the Young	45
First Stage of Development	45
Second Stage of Development	48
Third Stage of Development	49
Fourth Stage of Development	50
Daily Weight Increase	52
Parental Care	53
Removal of Eggshells	53
Care of the Young	53
Food	56
Nest Sanitation	57
Leaving the Nest	57
Enemies	58
Cowbird	60
Summary	63
References	

Tables

Figures

Graphs

Diagram

Plates