

AN
ECOLOGICAL SURVEY
OF
REESE'S BOG

1939

Harry H. Wilcox Jr.

and

Royal Bruce Brunson

Preface

As a requirement of the advanced course in Ornithology given at the University of Michigan Biological Station by Dr. Olin Sewall Pettingill, Jr., the co-authors of this paper attempted an ecological survey of Reese's Bog. Owing to the fact that the work was begun late in the season and the time of carrying out the work was limited the following report is quite incomplete, and the opinions and conclusions drawn from this survey may be proved groundless upon further study.

The co-authors wish to express their gratitude to Dr. Theodora Nelson for her kind suggestions and unlimited help, to Dr. Pettingill for his suggestive information and to Eugene Kenaga for his aid in the identification of the Flora of the area.

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Description

Reese's Bog is a triangular piece of land on the northern shore of Burt Lake, Cheboygan County, Michigan. It lies in Tier 36 North, Row 3 West, section 3. It is bounded on the South by the shore of the lake, on the ~~East~~ West by a private road running N.E., on the North by the Brutus-Topinabee road, and on the West by a road running a trifle West of due North from the lake toward the U. of M. Biological Station.

The Bog is a lake formation, originally a piece of Burt Lake proper. Sand bars cut off the tip of the old lake to form a beach-pool. Vegetation filled in this pool and with its debris formed the peat base of the bog. Above this peat base grows a thick mat of Sphagnum moss. In this humid substratum is rooted the cedar and balsam association of the bog which forms Zone 5.

The area studied and discussed in this report is the southern half of this piece of land as indicated on the map (plate # 1). This area was selected for study because of the various plant associations it contains and because it offered an opportunity for studying a fairly good ecological succession in bird life.

The first duties of the authors at the outset of this problem was to survey and measure the area, and to divide it up into different life zones. The area due to its geological history as a filled-in beach-pool can be divided into ten zones based upon the different types of vegetation.

Zone 1 is a strip of beach extending about twenty eight feet back from the water's edge and offering enough cover for the nests of the Spotted Sandpiper.

Zone 2 is a grassy strip from the beach to the edge of the

trees. In it grow low shrubs and young trees which afford excellent habitat for certain birds such as the Northern Yellowthroat.

Zone 3 is a narrow strip of thick woods extending in width from the edge of zone 2 to the edge of an abandoned road.

Zone 4 is this abandoned road, which is heavily overgrown and bordered by dense woods on both sides, and open path areas crossing the road.

Zone 5 is the bog proper. This is the area which perhaps contains the most interesting information of all, but which due to the limited time in which this problem was carried on, was hardly touched. This zone is very heavily forested with cedar and balsam. A few paths cross this zone and investigation is carried on with great difficulty. It is the hope of the authors to at some later date carry on the problem which they have begun and thoroughly work this part of the Bog.

Zone 6 is a bluff, arising sharply from the bog itself up onto a typical upland area of this region. The vegetation of this zone is extremely thick and very difficult to penetrate. It consists, for the most part, of large balsams with an intermixture of scattered beech and striped maple trees.

From this bluff (Zone 6) the land continues to rise at approximately a one percent slope to the North-easternmost boundary of the Bog area. Along with this slope a change in vegetation occurs. Here we have Zones 7, 8, and 9. The limits of these zones are not sharply defined because of the way the types of vegetation intergrades. Zone 7 is typed by a birch - oak association, Zone 8 by a beech - maple, and Zone 9 by a

Plant	Zone									
	1	2	3	4	5	6	7	8	9	10
Carex sp.			x							
Cercum arvense			x	x						
Chemopodium sp.							x			
Chitonium borealis			x		x					
Cornus canadensis				x						
Cornus stolonifera		x	x		x					
Cornus sytica		x								
Dryopteris thelypteris		x			x					
Equicetum arvenae			x							
Equicetum hymale	x									
Erigeron canadensis					x					
Eupatorium purpureum	x	x	x		x					
Fagus grandifolia								x		
Fraxinus niger		x	x	x						
Gammani sp.	x									
Habenaria hyperboreae					x					
Iris versicolor	x	x								
Lathyrus palustris			x							
Lepidium virginicum							x			
Linnea borealis					x					
Maranthum canadensis			x							
Mentha piperita	x				x					
Monotropa hypotropila			x							
Oenothera muricata				x						
Phleum pratense				x						
Picea mariana		x	x	x						

Fauna

The fauna of the Bog area, other than birds, consists of mammals typical of this region (as indicated by the U.B.S. Mammalogy collection), snakes, amphibians, and numerous invertebrates. Mammals observed in the area were Gray Squirrel (Sciurus carolinensis leucotis), Red Squirrel (Tamiasciurus hudsonicus loquax), chipmunk (Tamias striatus lysteri), flying squirrel (Glaucomys sabrinus macrotis), meadow mouse (Microtus p. pennsylvanicus), deer (Odocoileus virginianus borealis), and snowshoe rabbit (Lepus americanus). A large number of Garter and Ribbon snakes were found in Zones 1 and 2. Amphibians are numerous. Insect life is very abundant; the more abundant forms being mosquitoes, lace-wing flies, May flies, deer-flies, wood-borers, grass-hoppers, and crickets, all of which are food for a great variety of birds.

Birds of the area consisted of two major types: resident birds and non-resident birds. In the following list the resident birds are those apparently with territories within the bog boundary; the non-resident birds are those not residing in the area but whose territory included a portion of the bog.

Comprehensive List of Birds Found in Reese's Bog

A. Resident Birds. (*Nesting?*)

I. Birds with nests located.

1. Spotted Sandpiper - (2 nests) - 8 adults, 4 young.
2. Mourning Dove - (1 nest) - 3.
3. Yellow-billed Cuckoo - (nest?) - 1.
4. Ruby-throated Hummingbird - (2 nests) - 2 pairs.
5. Eastern Wood Pewee - (1 nest) - 4 pairs.
6. Blue Jay - (1 nest) - 2 adults, 2 young.
7. House Wren - (1 nest) - 2 adults, 4 young.
8. Robin - (7 nests) - 20.
9. Red-eyed Vireo - (1 nest) - 2 pairs.
10. Cowbird - 4 eggs only.
11. Chipping Sparrow - (1 nest) - 4 pairs, 2 young.

II. Birds with nests not located.

12. Ovenbird - 2 pairs.
13. Northern Yellow-throat - 1 pair.
14. Nighthawk - 4.
15. Whip-poor-will - 3.

III. Birds with families raised in the area.

16. Flicker - 2 adults, 4 young.
17. Black-capped Chickadee - 24 adults.
18. Red-breasted Nuthatch - 2 adults, 2 young.
19. Winter Wren - 2 adults, 4 young.
20. Black and White Warbler - 12 adults.

IV. Other Resident birds.

21. Ruffed Grouse - 1.
22. Killdeer - 2.
23. Black-billed Cuckoo - 1 or 2.
24. Downy Woodpecker - 1.
25. Eastern Kingbird - 2 pairs.
26. Crested Flycatcher - 1.
27. Eastern Phoebe - 1 pair.
28. Least Flycatcher.
29. White-breasted Nuthatch - 1.
30. Hermit Thrush 1.
31. Veery - 1.
32. Cedar Waxwing - 2.
33. Nashville Warbler - 2 pairs.
34. Parula Warbler - 1.
35. Black-throated Green Warbler - 5 pairs.
36. Black-poll Warbler - 1.
37. American Redstart - 4 pairs.
38. Scarlet Tanager - 1 pair.
39. Rose-breasted Grosbeak - 1 pair.
40. Indigo Bunting - 2 pair.
41. Purple Finch - 2.
42. Goldfinch - 3.
43. Towhee - 1.
44. Song Sparrow - 2 pairs.
45. Water Thrush - 2.

B. Non-resident Birds.

I. Birds seen near area.

46. Lesser Loon - 3.
47. Cerulean Warbler 1.
48. Common Tern

Comprehensive List of Birds Found in Reese's Bog (2)

II. Birds flying over area.

49. Cooper's Hawk - 1.
 50. Marsh Hawk - 1.
 51. Belted Kingfisher - 1.
 52. Purple Martin - 5.
 53. Herring Gull
 54. Crow - 3.

From the above list certain birds were seen in more than one zone. The following chart indicates the zones in which each resident bird was seen. The nighthawk was purposely omitted from this list since it is largely aerial.

Bird	Zone									
	1	2	3	4	5	6	7	8	9	10
Spotted Sandpiper	x									
Mourning Dove	x	x	x		x			x		
Yellow-billed Cuckoo				x				x		
Ruby-throated Hummingbird							x	x		
Wood Pewee							x	x	x	
Blue Jay				x	x					
House Wren		x	x							
Robin		x	x	x	x	x	x	x	x	x
Red-eyed Vireo							x	x		x
Cowbird							x	x	x	x
Chipping Sparrow							x	x	x	
Ovenbird				x	x	x	x	x		
Northern Yellow-throat		x								
Flicker			x	x	x					
Black-capped Chickadee			x	x	x					
Red-breasted Nuthatch				x	x					
Winter Wren					x					

Bird	Zone									
	1	2	3	4	5	6	7	8	9	10
Black and White Warbler			x	x	x					
Grouse					x					
Killdeer	x									
Black-billed Cuckoo		x					x	x		
Downy Woodpecker				x	x					
Kingbird		x								x
Crested Flycatcher		x		x						
Eastern Phoebe		x								
Least Flycatcher								x		
White-breasted Nuthatch					x					
Hermit Thrush					x					
Veery			x	x	x					
Cedar Waxwing		x								
Nashville Warbler				x	x					
Parula Warbler			x	x	x					
Black-throated Green Warbler					x					
Black-poll Warbler					x					
American Redstart			x	x						
Scarlet Tanager					x	x	x			
Rose-breasted Grosbeak				x	x					
Indigo Bunting				x						x
Purple Finch				x						
Goldfinch		x								
Towhee								x	x	
Whip-poor-will			x	x			x	x	x	
Song Sparrow			x							x
Water Thrush			x							

Territories and Nests

From this chart we find that certain birds inhabit certain types of areas. That these birds establish territories within these areas was evident from their singing and actions in the fields. The Northern Yellowthroat established its territory entirely in zone 2 (Fig. 2 plate 3); the flicker established its territory within Zone 5 (Fig. 1 plate 3), other territories are shown in Figures 1 and 2 of Plates 3 and 4. The territories of some of these birds are approximation because the nests were not found. As an example - the Parula Warbler's nest was not found but the presence of *Osnia* (chief nesting material) and the fact the adult male had certain located singing perches indicated a territory and a probable nest within. Likewise the presence of a family of young birds, as in the case of the winter wren, indicated the presence of a nest within a territory previously outlined by the singing male.

However, some territories are established not only by the singing male but by the location of the nest itself. The House Wren established its territory within Zone 2 (Fig. 1 plate 3) and built its nest in a rotten birch stub. While the female took care of the young, the male proclaimed the territory by singing from located perches within the boundaries of the territory. On the other hand, although the nest of the Blue Jay was found (Plate 5), there seemed to be no definite territory unless it was approximated by the boundaries of the Bog, outside of which the birds were never seen. Locations of nests of other birds are shown on Plates 5 and 6. Data was taken on all nests found but limited time and space prevents a description of each in this paper.

Physical relationships

From observation during the survey it is apparent that light and temperature are factors for bird song and activity. The Whip-poor-will was the first bird to show activity in the morning, singing just as the sky began to lighten, continuing until a half hour before sunrise. Shortly after the Whip-poor-will began its song, the Robins began their "twittering," followed by the Red-eyed Vireo, Wood Pewee, the Veery, the Hermit Thrush and the Winter Wren. Just as the first rays of the sun struck the tops of the taller trees the warblers began their songs. Singing activity seems to reach its zenith at about eight o'clock a.m., begins to decrease toward nine o'clock a.m. and ends about ten o'clock a.m., except for the birds that sing nearly all day. In the late afternoon singing activity increases, fading towards dusk, ending with the Whip-poor-will's song from dusk to darkness. Variations of this time succession during the day are caused by changes in the weather such as cloudiness, rain, heat, cold et cetera. Thus on cool, cloudy days we find only such birds as the Red-eyed Vireo, the Winter Wren, the Robins singing. A slight rain in the morning seems to keep the birds active for a longer time, while a very warm muggy morning retards singing activity.

Conclusions

From seven weeks work of observations in Reese's Bog and information from data compiled in this paper, the co-authors drew the following conclusions:

1. That an area of this size and type will support a total population of from 250 - 300 birds.
2. That most birds have quite definite territories, the

size depending upon the species of bird.

3. That there is an ecological succession of birds corresponding to the ecological succession of plants. This conclusion is supported by the fact that certain birds are typical to certain areas. Thus we find the Spotted Sandpiper and Killdeer are typical of a sandy beach; the Northern Yellow-throat is found in low grassy and bushy places; the Parula Warbler, the Nashville Warbler, Black and White Warbler, Winter Wren, Chick-a-dee, Red-breasted Nuthatch, and Black-throated Green Warbler are typical of deep bog; the Red-eyed Vireo, Wood-Pewee, Indigo Bunting and Least Flycatcher are found in more open woods of upland areas; and there are certain species as the Robin and Blue Jay, that are not restricted to any definite location, but may be found in any type of area.

4. That roads seem to form a common boundary between territories of the same species. This was especially noticeable in the case of the Winter Wren and Ovenbird. In the case of the Winter Wren the singing males were observed defying each other with their songs, each proclaiming his respective side of the road. The same actions were observed in the Ovenbird.

5. That favorite nesting places are located near roads and paths, and around clearings and open places.

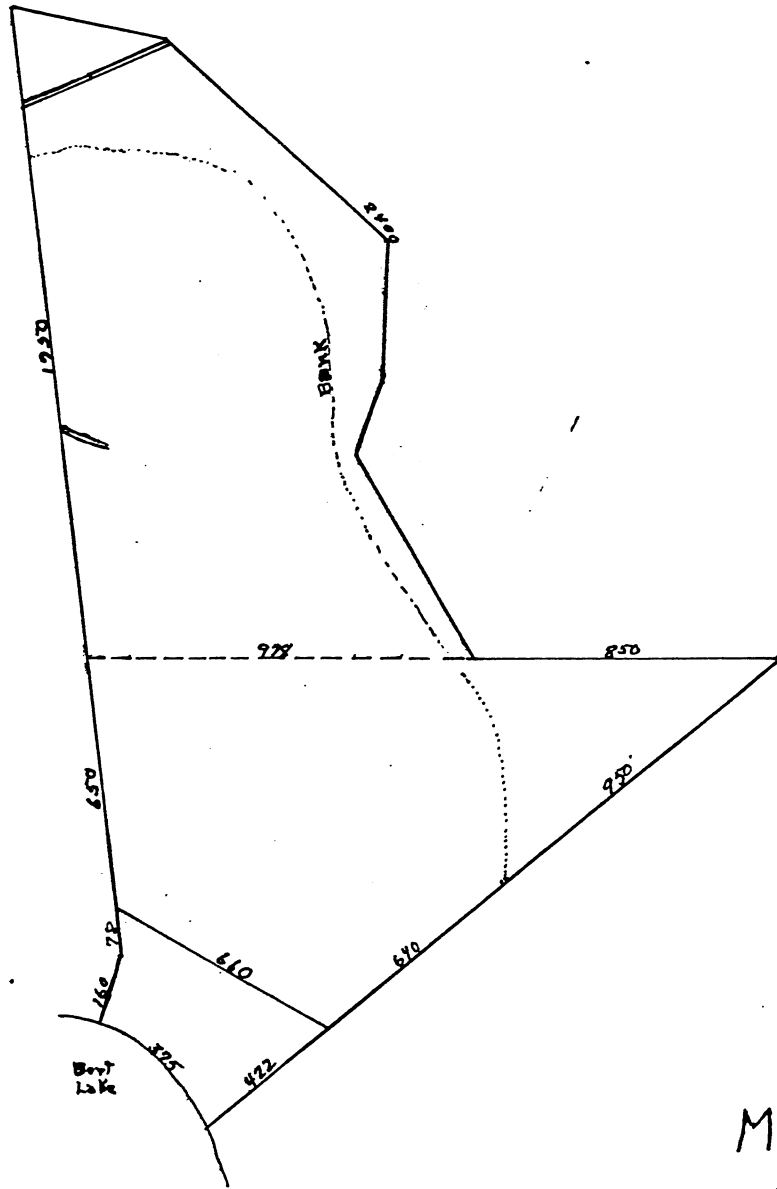
6. That the upland area is parasitized by cowbirds.

7. That the lack of ground-nesting birds of zones land 2 may be due to the large number of snakes found there, and the number of nesting birds as a whole may have been lessened by the destructive mammals and birds - such as the Red Squirrel, Flying Squirrel, and Blue Jay.

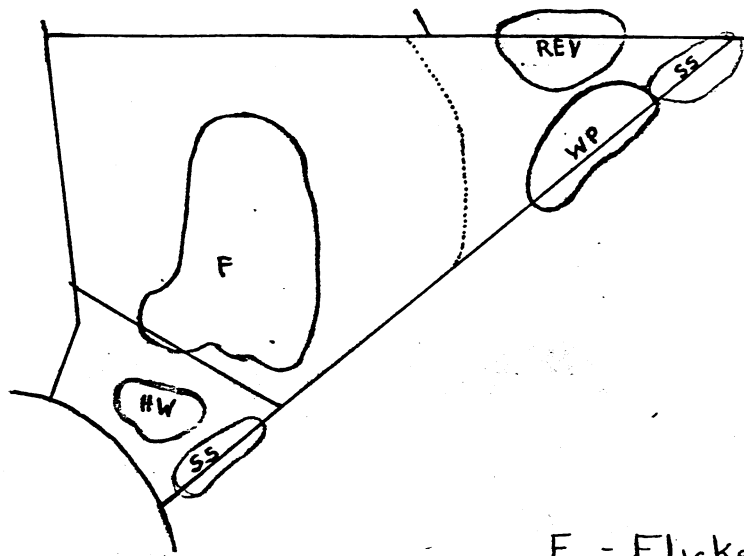
8. That temperature and light are definite factors in the singing activity of birds.

Summary

1. 54 species of birds observed, including the Black Poll Warbler.
2. 200-225 different birds seen in the area.
3. Nests of 11 species of birds found.
4. Families of 5 additional species found including Winter Wren.
5. Tentative territories of 25 birds established.
6. 15 billion mosquitoes killed. RESQUIANT IN PACE.

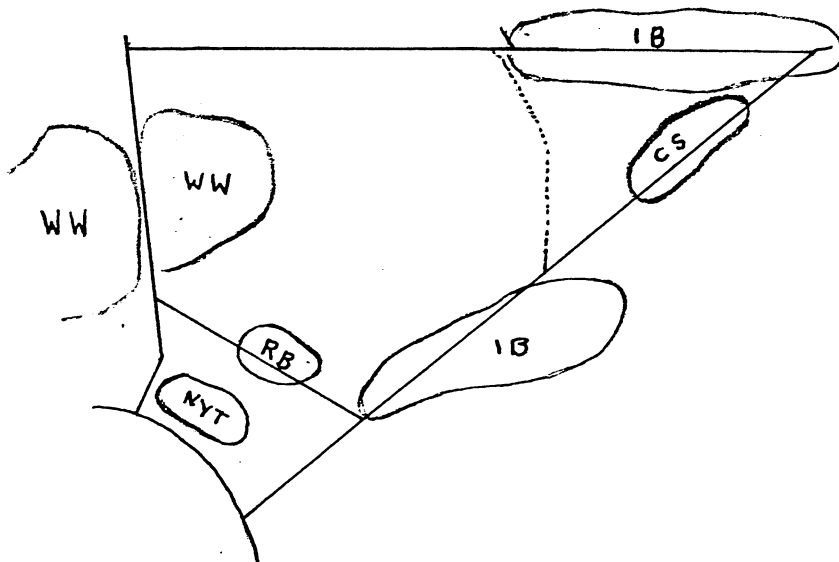


MAP
OF
REESE'S BOG



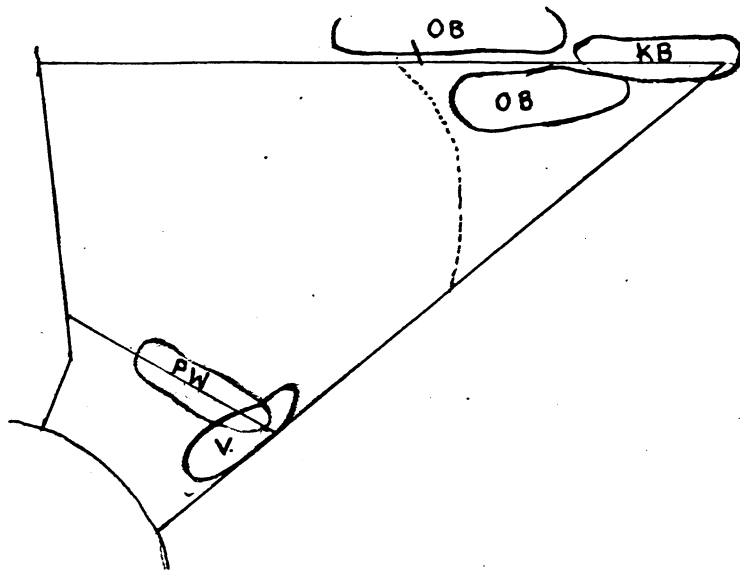
F. - Flicker
 HW- House Wren
 REV- Red-eyed Vireo
 SS - Song Sparrow
 WP- Wood Pewee

Fig. I TERRITORIES



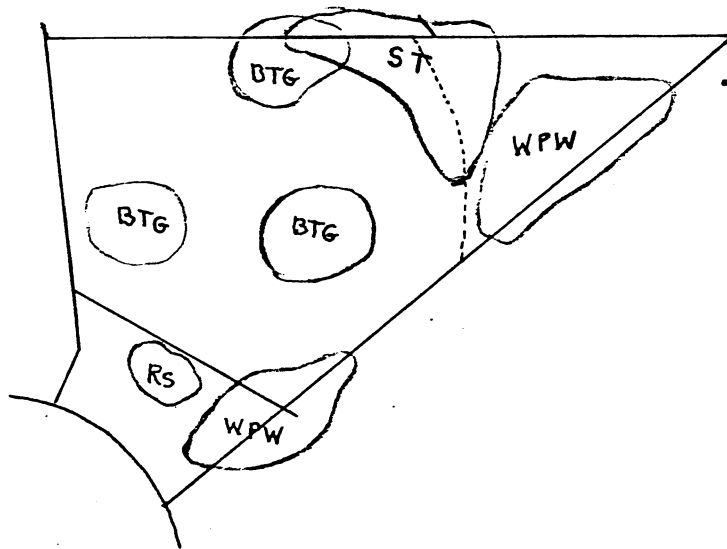
CS - Chipping Sparrow
 IB - Indigo Bunting
 NYT- Northern Yellow-throat
 RB - Red-breasted Nuthatch
 WW- Winter Wren

Fig. II TERRITORIES



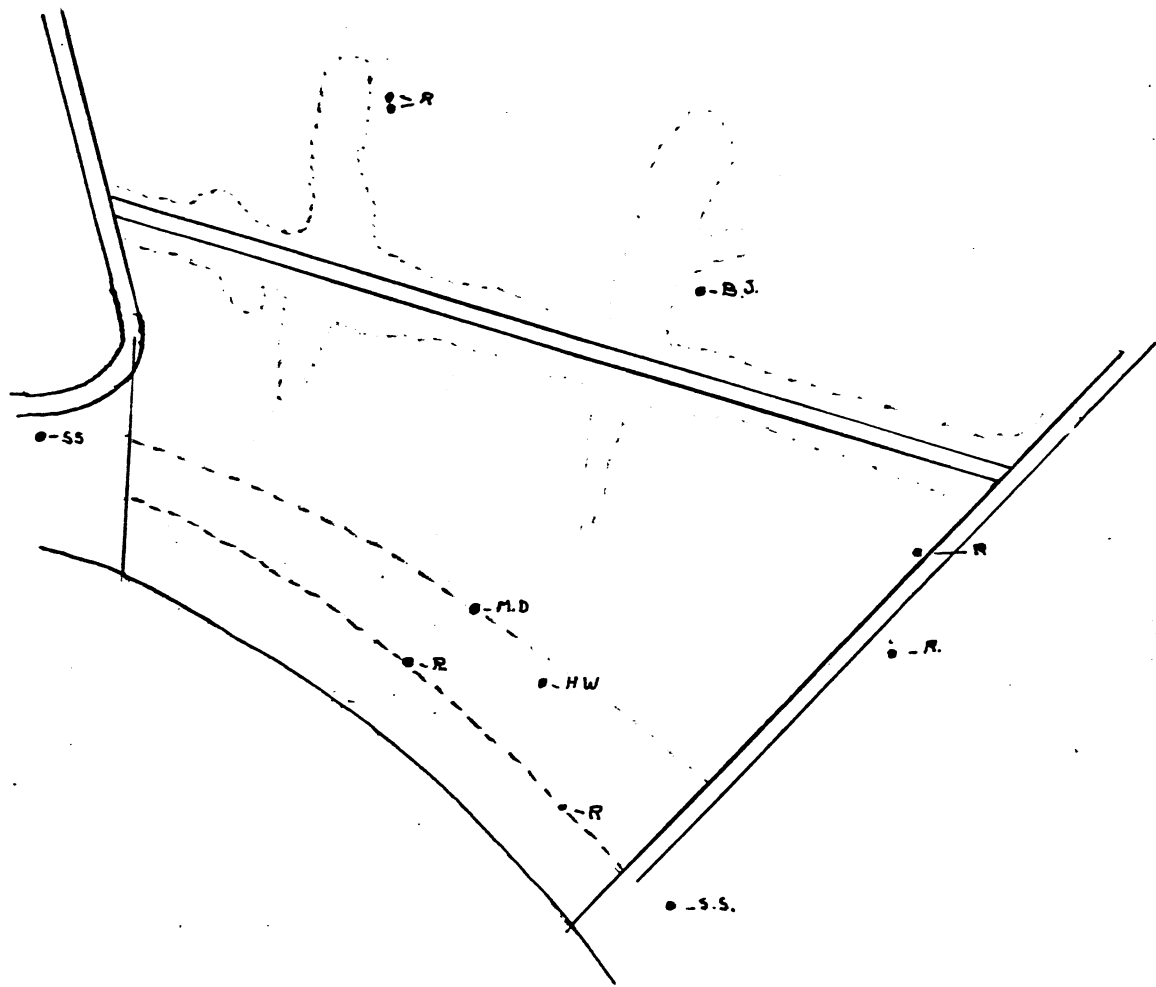
KB - Kingbird
 OB - Ovenbird
 PW - Parula Warbler
 V - Veery

Fig. I TERRITORIES



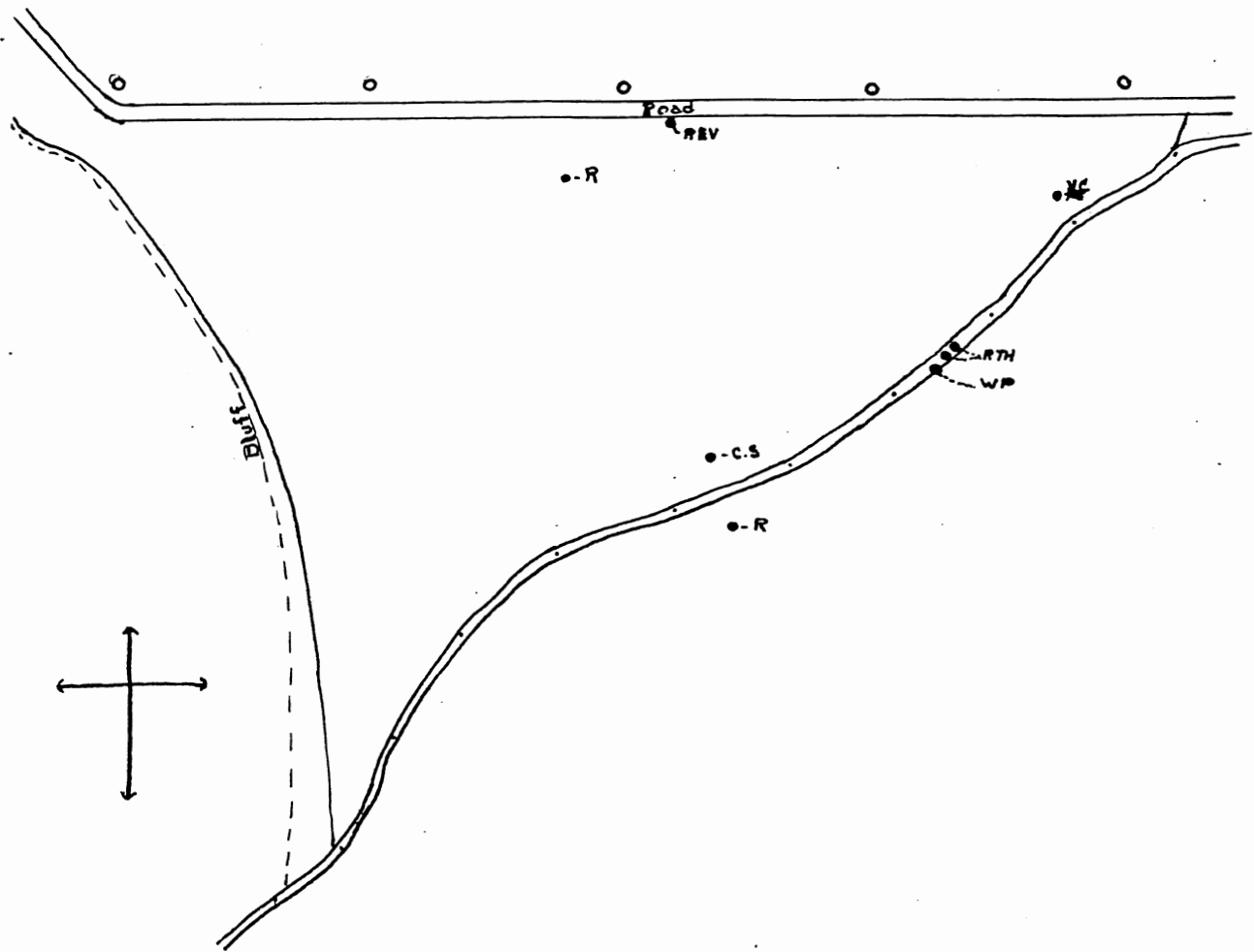
BTG - Black-throated Green Warbler
 RS - Redstart
 ST - Scarlet Tanager
 WPW - Whip-poor-will

Fig. II TERRITORIES



NESTS OF BEACH-ROAD AREA

- M.D. - Mourning Dove
- S.S. - Spotted Sandpiper
- H.W. - House Wren
- B.J. - Blue Jay
- R. - Robin



NESTS OF UPLAND AREA

- R.T.H. - Ruby-throated Hummingbird
- R.E.V. - Red-eyed Vireo
- Y.C. - Yellow-billed Cuckoo
- C.S. - Chipping Sparrow
- W.P. - Wood Pewee
- R. - Robin



Fig. 1 Zones 1, 2 & edge of Zone 3



Fig. 2 Zone 4

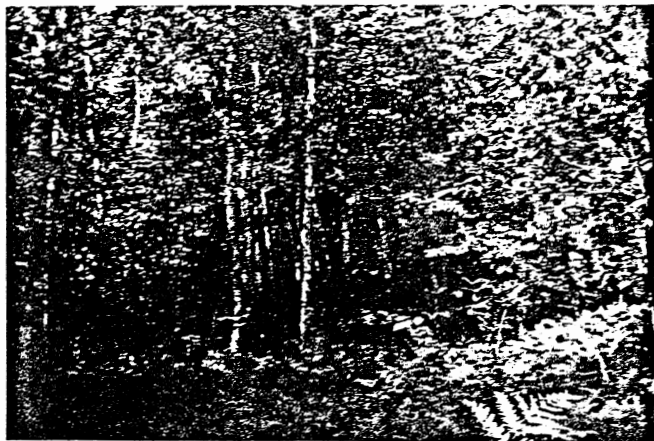


Fig. 3 Zone 7

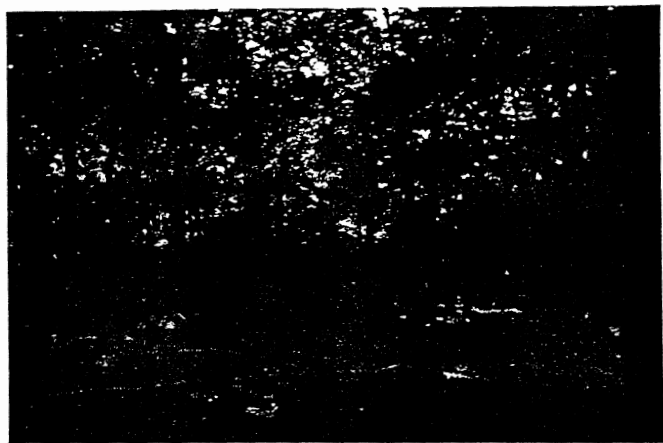


Fig.1 Zone 8



Fig. 2 Zone 9



Fig. 1 Great Blue Herons in Zone 8?

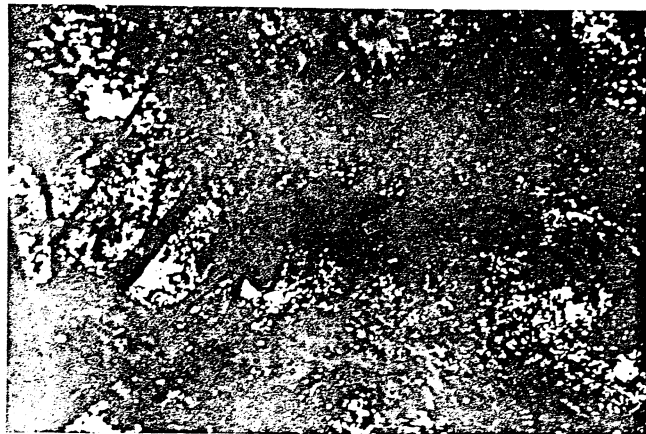


Fig. 2 Move over Vireo!

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Erigeron canadensis					x					
Eupatorium purpureum	x	x	x		x					
Fagus grandifolia								x		
Fraxinus niger		x	x	x						
Gammani sp.	x									
Habenaria hyperborea					x					
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Picea mariana		x	x	x						

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42. Goldfinch - 3.
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Yellow-billed Cuckoo				x				x		
Ruby-throated Hummingbird							x	x		
Wood Pewee							x	x	x	
Blue Jay				x	x					
House Wren		x	x							
Robin		x	x	x	x	x	x	x	x	x
Red-eyed Vireo							x	x		x
Cowbird							x	x	x	x
Chipping Sparrow							x	x	x	
Ovenbird				x	x	x	x	x		
Northern Yellow-throat		x								
Flicker			x	x	x					
Black-capped Chickadee			x	x	x					
Red-breasted Nuthatch				x	x					
Winter Wren					x					

Bird	Zone									
	1	2	3	4	5	6	7	8	9	10
Black and White Warbler			x	x	x					
Grouse					x					
Killdeer	x									
Black-billed Cuckoo		x					x	x		
Downy Woodpecker				x	x					
Kingbird		x								x
Crested Flycatcher		x		x						
Eastern Phoebe		x								
Least Flycatcher								x		
White-breasted Nuthatch					x					
Hermit Thrush					x					
Veery			x	x	x					
Cedar Waxwing		x								
Nashville Warbler					x	x				
Parula Warbler				x	x	x				
Black-throated Green Warbler						x				
Black-poll Warbler						x				
American Redstart			x	x						
Scarlet Tanager						x	x	x		
Rose-breasted Grosbeak					x	x				
Indigo Bunting					x					x
Purple Finch					x					
Goldfinch			x							
Towhee									x	x
Whip-poor-will				x	x			x	x	x
Song Sparrow			x							x
Water Thrush				x						

Territories and Nests

From this chart we find that certain birds inhabit certain types of areas. That these birds establish territories within these areas was evident from their singing and actions in the fields. The Northern Yellowthroat established its territory entirely in zone 2 (Fig. 2 plate 3); the flicker established its territory within Zone 5 (Fig. 1 plate 3), other territories are shown in Figures 1 and 2 of Plates 3 and 4. The territories of some of these birds are approximation because the nests were not found. As an example - the Parula Warbler's nest was not found but the presence of Osnia (chief nesting material) and the fact the adult male had certain located singing perches indicated a territory and a probable nest within. Likewise the presence of a family of young birds, as in the case of the winter wren, indicated the presence of a nest within a territory previously outlined by the singing male.

However, some territories are established not only by the singing male but by the location of the nest itself. The House Wren established its territory within Zone 2 (Fig. 1 plate 3) and built its nest in a rotten birch stub. While the female took care of the young, the male proclaimed the territory by singing from located perches within the boundaries of the territory. On the other hand, although the nest of the Blue Jay was found (Plate 5), there seemed to be no definite territory unless it was approximated by the boundaries of the Bog, outside of which the birds were never seen. Locations of nests of other birds are shown on Plates 5 and 6. Data was taken on all nests found but limited time and space prevents a description of each in this paper.

Physical relationships

From observation during the survey it is apparent that light and temperature are factors for bird song and activity. The Whip-poor-will was the first bird to show activity in the morning, singing just as the sky began to lighten, continuing until a half hour before sunrise. Shortly after the Whip-poor-will began its song, the Robins began their "twittering," followed by the Red-eyed Vireo, Wood Pewee, the Veery, the Hermit Thrush and the Winter Wren. Just as the first rays of the sun struck the tops of the taller trees the warblers began their songs. Singing activity seems to reach its zenith at about eight o'clock a.m., begins to decrease toward nine o'clock a.m. and ends about ten o'clock a.m., except for the birds that sing nearly all day. In the late afternoon singing activity increases, fading towards dusk, ending with the Whip-poor-will's song from dusk to darkness. Variations of this time succession during the day are caused by changes in the weather such as cloudiness, rain, heat, cold et cetera. Thus on cool, cloudy days we find only such birds as the Red-eyed Vireo, the Winter Wren, the Robin singing. A slight rain in the morning seems to keep the birds active for a longer time, while a very warm muggy morning retards singing activity.

Conclusions

From seven weeks work of observations in Reese's Bog and information from data compiled in this paper, the co-authors drew the following conclusions:

1. That an area of this size and type will support a total population of from 250 - 300 birds.
2. That most birds have quite definite territories, the

size depending upon the species of bird.

3. That there is an ecological succession of birds corresponding to the ecological succession of plants. This conclusion is supported by the fact that certain birds are typical to certain areas. Thus we find the Spotted Sandpiper and Killdeer are typical of a sandy beach; the Northern Yellow-throat is found in low grassy and bushy places; the Parula Warbler, the Nashville Warbler, Black and White Warbler, Winter Wren, Chick-a-dee, Red-breasted Nuthatch, and Black-throated Green Warbler are typical of deep bog; the Red-eyed Vireo, Wood-Pewee, Indigo Bunting and Least Flycatcher are found in more open woods of upland areas; and there are certain species as the Robin and Blue Jay, that are not restricted to any definite location, but may be found in any type of area.

4. That roads seem to form a common boundary between territories of the same species. This was especially noticeable in the case of the Winter Wren and Ovenbird. In the case of the Winter Wren the singing males were observed defying each other with their songs, each proclaiming his respective side of the road. The same actions were observed in the Ovenbird.

5. That favorite nesting places are located near roads and paths, and around clearings and open places.

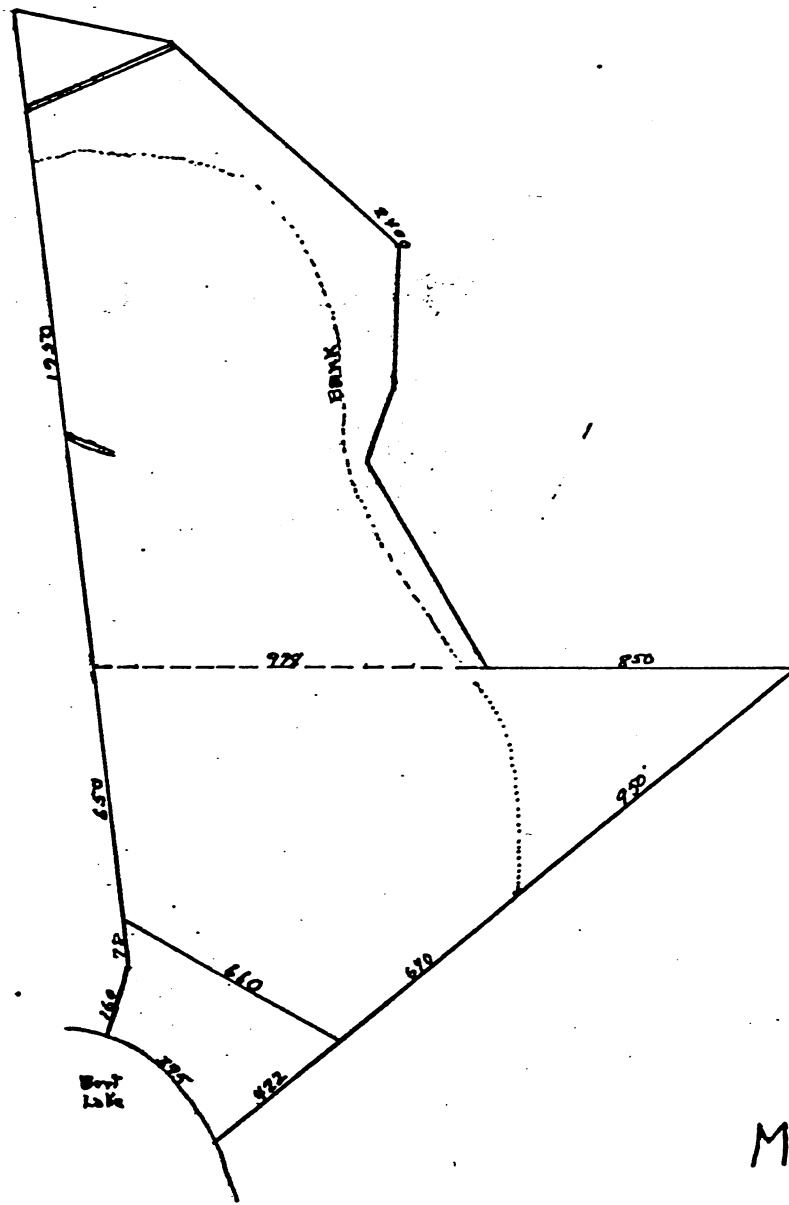
6. That the upland area is parasitized by cowbirds.

7. That the lack of ground-nesting birds of zones land 2 may be due to the large number of snakes found there, and the number of nesting birds as a whole may have been lessened by the destructive mammals and birds - such as the Red Squirrel, Flying Squirrel, and Blue Jay.

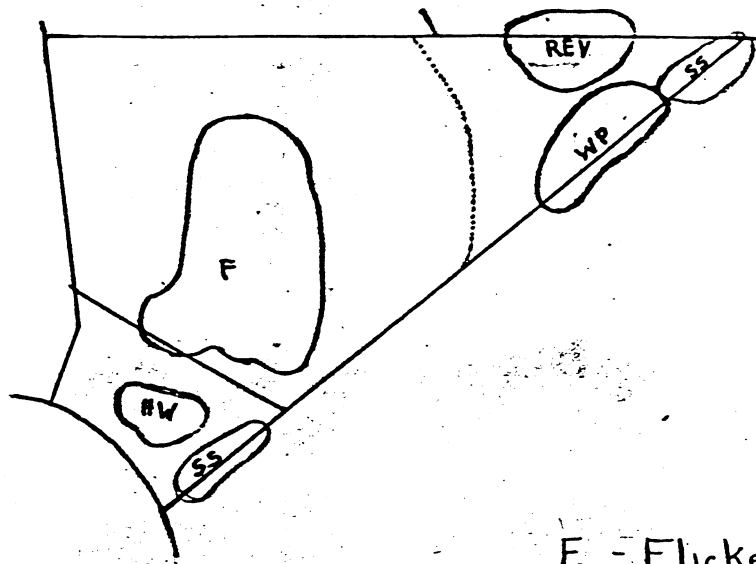
8. That temperature and light are definite factors in the singing activity of birds.

Summary

1. 54 species of birds observed, including the Black Poll Warbler.
2. 200-225 different birds seen in the area.
3. Nests of 11 species of birds found.
4. Families of 5 additional species found including Winter Wren.
5. Tentative territories of 25 birds established.
6. 15 billion mosquitoes killed. RESQUIANT IN PACE.

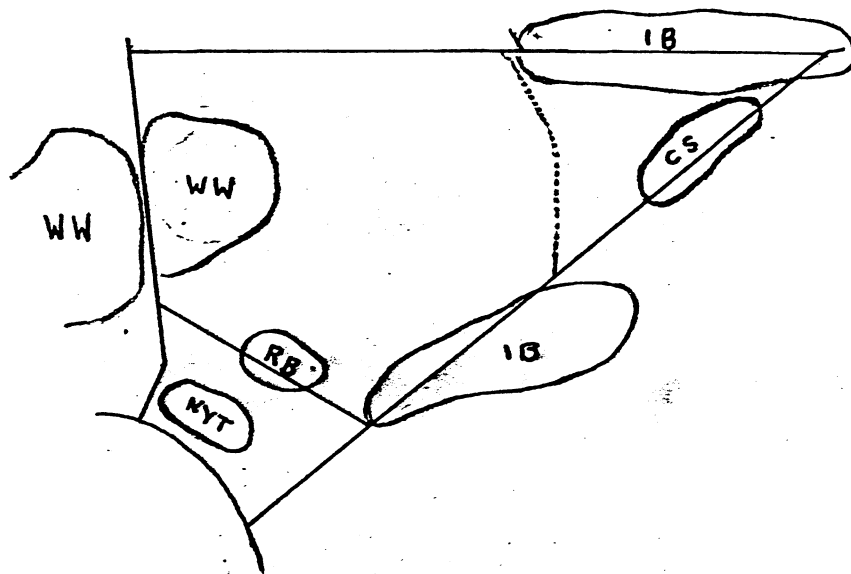


MAP
OF
REESE'S BOG



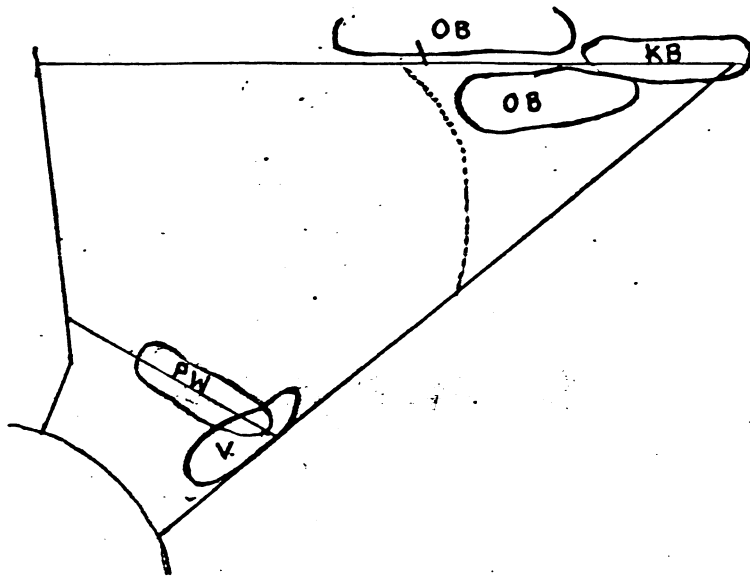
F - Flicker
 HW - House Wren
 REV - Red-eyed Vireo
 SS - Song Sparrow
 WP - Wood Pewee

Fig. I TERRITORIES



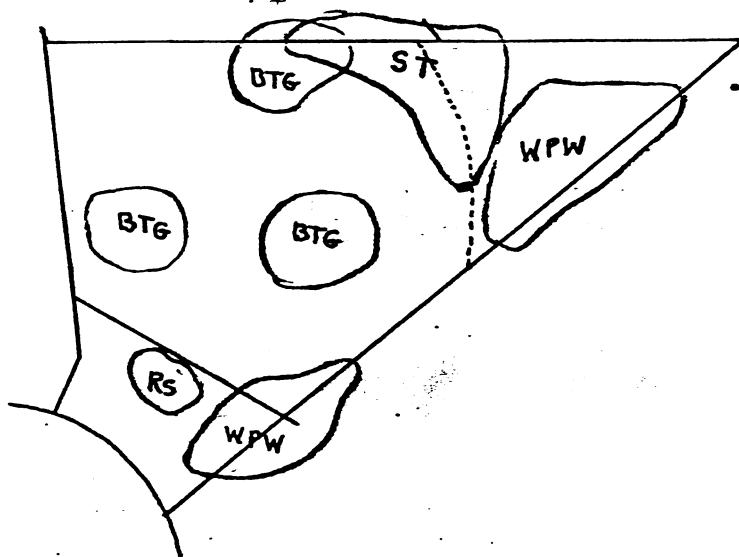
CS - Chipping Sparrow
 IB - Indigo Bunting
 NYT - Northern Yellow-throat
 RB - Red-breasted Nuthatch
 WW - Winter Wren

Fig. II TERRITORIES



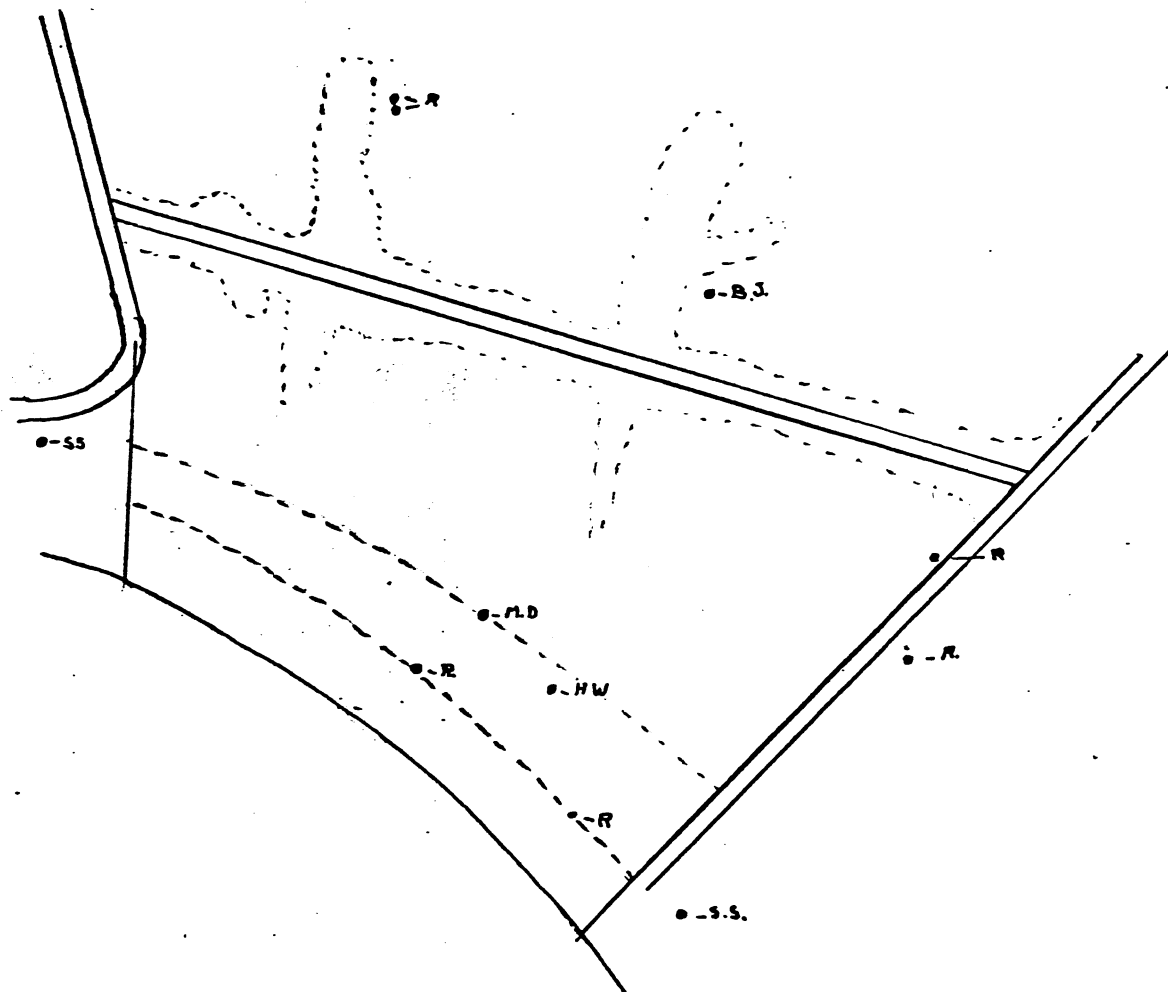
KB - Kingbird
 OB - Ovenbird
 PW - Parula Warbler
 V - Veery

Fig. I TERRITORIES



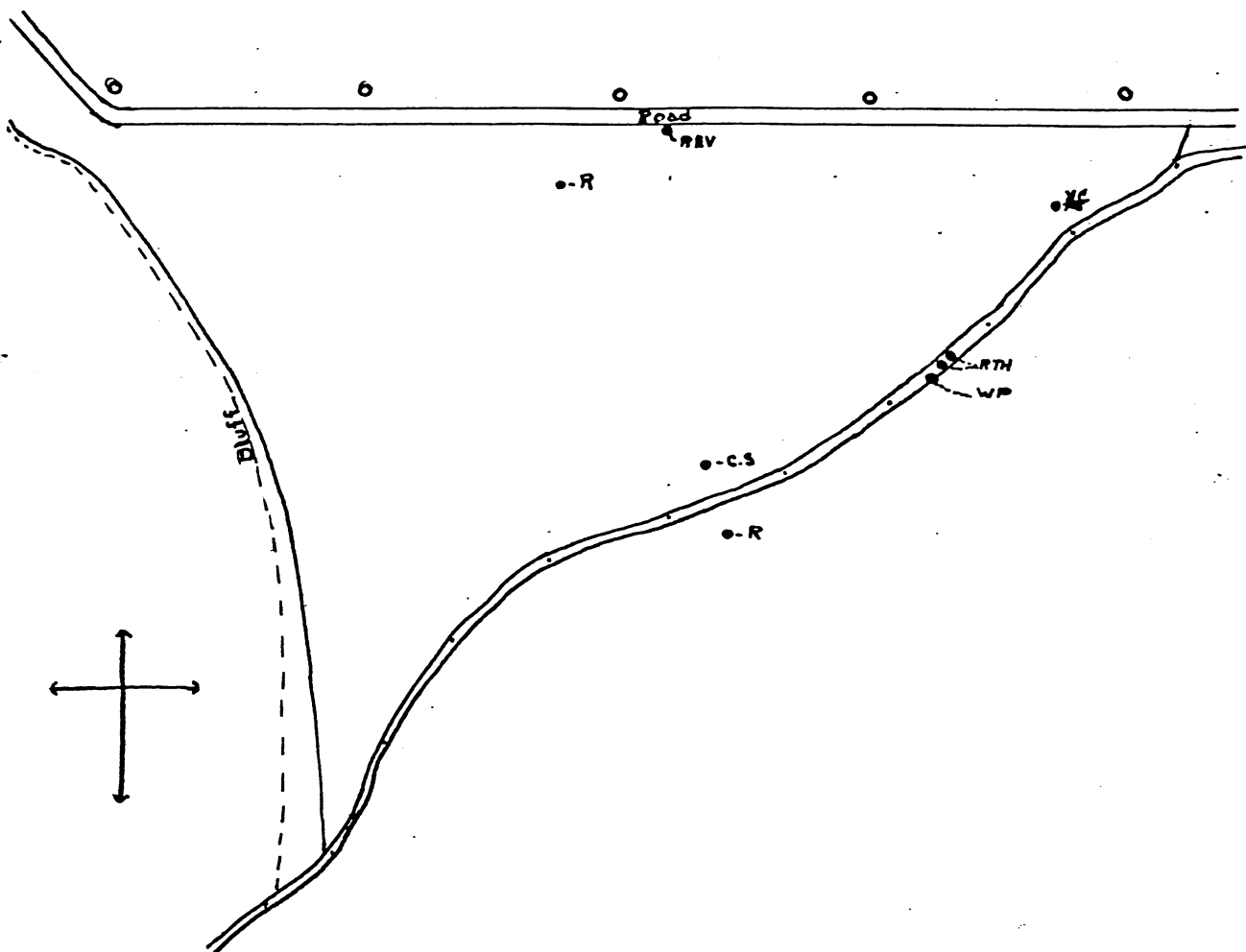
BTG - Black-throated Green Warbler
 RS - Redstart
 ST - Scarlet Tanager
 WPW - Whip-poor-will

Fig. II TERRITORIES



NESTS OF BEACH-ROAD AREA

- M.D. - Mourning Dove
- S.S. - Spotted Sandpiper
- H.W. - House Wren
- B.J. - Blue Jay
- R. - Robin



NESTS OF UPLAND AREA

- R.T.H. - Ruby-throated Hummingbird
- R.E.V. - Red-eyed Vireo
- Y.C. - Yellow-billed Cuckoo
- C.S. - Chipping Sparrow
- W.P. - Wood Pewee
- R. - Robin

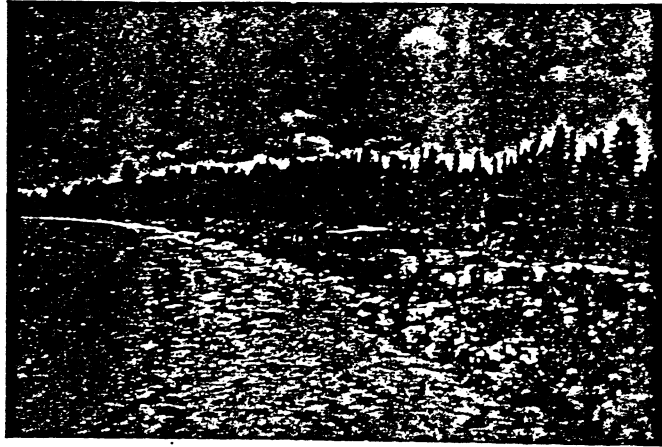


Fig. 1 Zones 1, 2 & edge of Zone 3



Fig. 2 Zone 4



Fig. 3 Zone 7



Fig.1 Zone 8



Fig. 2 Zone 9



Fig. 1 Great Blue Herons in Zone 8?



Fig. 2 Move over Vireo!