

# The Redstart

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**NOTICE:** The heading Volume 23, No. 2 should read March 1956 not 1955

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Editor's Note

The following paper is most significant and should be studied by all serious bird students especially those interested in avian population dynamics and those who have attended the Brooks Bird Clubs "Forays".

AN ANALYSIS OF THE BREEDING BIRD POPULATION DATA  
OBTAINED ON THE BROOKS BIRD CLUB FORAYS

Part I

By George A. Hall

Introduction

Since 1948 the principal effort of the ornithological workers at the Brooks Bird Club Forays has been directed towards making quantitative breeding bird census on selected study areas. Over the years a total of twenty-five such studies on twenty-one different areas has been carried out (four areas were censused on two different years). With this large mass of data, it seems desirable to attempt to carry out an analysis of the results obtained and to attempt to draw some generalizations about bird populations in West Virginia.

There are, of course, several methods of approach to this problem and different conclusions may be drawn from each. This first paper will present a discussion of the reliability of the data and an analysis of the species of birds found to occur on the study areas. It is hoped that a subsequent paper giving a comparison of the areas based on the quantitative population data will appear in the near future.

The Data

Full descriptions of the study areas and the results of the population studies have been published in THE REDSTART (DeGarmo - 1949; 1950a, 1950b, 1952, 1953; Hall - 1952, 1955; Heimerdinger - 1954). A full listing of the twenty-one areas is given in Table V in the appendix to this paper. Table I summarizes the vegetational types represented by the areas.

Table I

Vegetational Types of the Various Study Areas

<u>Type</u>	<u>No. of Areas</u>	<u>Type</u>	<u>No. of Areas</u>
Deciduous Forest	9	Wooded Marsh	1
Coniferous Forest	2	Brushy Field	2
Mixed Coniferous-Deciduous	3	Orchard	1
Oak-Pine Forest	3		

As might be expected most of the studies have been in forest types and of these the deciduous forest is most prevalent. Several different growth stages are represented in each type although most of the studies have been in mature or near mature stands. All of the principal forest types occurring in West Virginia are represented by at least one study. Little attention has been paid to greatly dis-

turbed or man-made habitats and only three such are represented. It is suggested that in the future more attention might be paid to brushy habitats which have been poorly represented. Most of the areas have been pure stands of their type, but some have been of mixed type and this leads to some difficulty in evaluating the data.

### Reliability of the Results

All attempts to determine the populations of wild animals are necessarily in some error and these studies are no exception. The errors may be divided into two categories: (1) those inherent in the method used, and (2) those due to the observers or observational techniques used.

The populations were determined in every case by the Williams "Singing Male Method" which, as is well known, involves a number of inherent inaccuracies (Kendeigh - 1944; Dice - 1952). The method fails for colonial birds, for polygamous birds such as the Redwing (Agelaius phoeniceus) and Cowbird (Molothrus ater) for shy secretive birds, and of course of all non-singing birds. Fortunately, the populations studied have contained few examples of these species and the majority of the species represented are small passerine birds for which the method is quite satisfactory. Even for these species, however, the very fundamental objection can be raised that a singing male defending a territory is not necessarily representative of a breeding pair. (Indeed such a case was fairly well established for a House Wren (Troglodytes aedon) on the overgrown pasture area studied in 1955). This objection is not valid for common species in the writer's opinion. Since the unpaired male is occupying a territory which could hold a pair and hence the effect on the population density (if not the true population) is the same; however, for rare species in extralimital situations the objection is valid.

More serious are the errors resulting from the observers and the observational techniques used.

The observers have varied in competence from those of the highest abilities to those of only moderate abilities. Since most of the work has been done in teams rather than by individuals the error introduced here is probably very small. In the early years all the observers were more or less inexperienced in census work and this may have introduced some error.

All of the studies concerned were made for only one week during early or middle June. Thus large errors no doubt prevail in the populations of such early nesters as the Titmice (Parus spp.), Nuthatches (Sitta spp.), Owls and others. Late nesters such as the Common Goldfinch (Spinus tristis) and Cedar Waxwing (Bombycilla cedrorum) are usually not found on the areas. Again, fortunately these species probably represent only a small portion of total populations.

Most of the study areas were long narrow strips. This introduces the difficult problem of ascertaining the true state of territorial relationships at the strip boundaries. On a narrow strip a larger fraction of the total pairs will have territories near the boundaries and large errors can arise from incorrect decisions as to the fraction of these territories properly on the census area. It is felt that this is one of the two principal sources of error involved in these studies.

In many cases the strips were actually curved on the existing terrain since usually trails or old roads were used as center lines. In such cases there exists the possibility of counting birds twice, once on each side of the curve. No doubt the data are in some error from this cause.

The nature of the terrain itself can introduce errors. If the strip follows a ridge top, as was true in many cases, it is often difficult to decide whether or not a given song given from down-slope is or is not properly within the strip boundaries.

Perhaps the most serious error has been that most of the difficult decisions in delineating territories have been made from the species maps in camp or even in some cases at home after a period of time has elapsed. This can lead to large errors in the populations. Since the time available for the census work is limited this is, in part, unavoidable but every effort should be made to decide the difficult cases in the field on the territories involved.

It is, of course, not possible to evaluate the effects of these errors at present. For all of the analysis that follows, the population figures will be taken as available but the possibility of such errors should be realized. It is the writer's opinion that in most cases the errors are small and that they will not vitiate the conclusions that will be drawn. Certain quantitative tests of the data are possible and these will be made where pertinent in the hopes of testing the accuracy of the data.

#### The Species List

A total of 108 species have been listed as breeding on the study tracts. During the same period a total of 157 species has been listed as summering in the regions studied (This figure compiled from the published Foray Bird Lists: Handlan - 1949; DeGarmo - 1950c; Breiding - 1950; Hall - 1951, 1953; Heimerdinger - 1952; Conrad - 1954; and Phillips - 1955). As of 1955 the list of breeding birds for the state of West Virginia stands at about 160. (This figure determined from personal judgement and from the lists of Brooks (1944) and Handley (1954). It should be noted here parenthetically that the ratio of 175 species recorded to the 160 species on the breeding list is not as favorable as might first be thought. Approximately 12-15 species on the Foray Lists have not been known to breed in West Virginia even though they may occasionally be recorded in summer.

The gross total of 108 is subject to some correction due to the ambiguous status of the so-called "plus" birds. This designation has three distinct connotations in most of the published data: (1) It has been used to designate species whose territory, even though small, is less than one-half included in the census tract. Such species may well contribute significantly to the total population density when this is computed on the standard 100-acre basis, although this contribution cannot be calculated and is more or less determined by accident in locating the areas. (2) It has been used to designate species such as the Pileated Woodpecker (Dryocopus pileatus), certain Hawks, etc., whose territories are in general much larger than the small census tract. On the 100-acre basis these also might contribute significantly to the total population. (3) It has been used to designate species which have wandered through the area and have been recorded on several occasions but whose territorial relations are not fixed (or at least not determinable) at the time of the census. Ruffed Grouse (Bonasa umbellus) and Wild Turkey (Meleagris gallopavo) may be cited as examples. While the first two meanings are legitimately included in the "plus" category, the last one is not. Further in some of the published censuses the "plus" category has been used to designate species which are purely visitors observed flying over the areas. At this late date it is not possible to separate completely the "plus" birds into these various categories and it seems desirable for some purposes to delete them completely and to focus most attention upon those species which have contributed a numerical population to the studied area. If this is done the list

of species totals only 88 and many of the more unusual species have been eliminated. In much of the following discussion both the gross list, including the "plus" birds and the contributing list, omitting them, will be included.

#### Phylogenetic Analysis of the Species List

The habitats studied are most suitable for occupation by small passerine birds and it comes as no general surprise that most of the species fall into this category. Table II lists the occurrences of species by families.

Table II

Number of Species of Each Family Occurring on the Study Areas

Family	No. on Gross List	No. on Contributing List	No. on State Breeding List
Hérons	1	0	2
Hawks	2	0	11
Gallinaceous	3	2	4
Shorebirds	3	2	5
Doves	1	1	1
Cuckoos	2	2	2
Owls	3	0	6
Goatsuckers and Swifts	1	0	3
Hummingbirds	1	1	1
Kingfishers	1	0	1
Woodpeckers	5	5	7
Flycatchers	7	6	8
Larks	1	1	1
Crows	3	1	3
Titmice	3	3	3
Nuthatches	2	2	2
Creepers	1	1	1
Wrens	5	4	6
Mimic Thrushes	2	2	3
Thrushes	6	6	6
Old World Warblers	2	2	2
Waxwings	1	1	1
Starlings	1	0	1
Vircos	4	4	5
Wood Warblers	25	25	28
Troupials	3	2	7
Tanagers	2	2	2
Fringillids	17	13	22
Totals	108	88	144

Thus 85 (79.5%) of the gross list are passerine birds and 85% of the contributing list are in this order. Passerines represent 72% of the state breeding list.

It is of interest to note the sizeable number of families for which complete or nearly complete representation is given.

It is a trite fact to most bird students of the Appalachian region that the

family Parulidae represents a major portion of both the species listed and of the total population, but the above table shows clearly that 23% of the total species comes from this family and later consideration of the population figures will show that 44.5% of the pairs are Wood Warblers. It came as some surprise to the writer to find that only three Warbler species known to breed in West Virginia are not included. These are: (1) the Prothonotary Warbler (Prontothotaria citrea) which is known to breed in only a very few isolated stations, most of which are along the Shenandoah River; (2) the Blue-winged Warbler (Vermivora pinus) which is a common breeding bird only in the Upper Ohio Valley where studies have not been made; and (3) the Yellow-throated Warbler (Dendroica dominica) which has been found breeding in only one or two places. It is of interest to note that this bird has been found in summer along Twelvepole Creek in Wayne County where one of the censuses was made (Brooks - 1954).

The only vireo missing from the list is the Warbling Vireo (Vireo gilvus), a bird of spotty distribution in the state and one not found in the types of habitat mostly studied.

The fringillid list also carries a substantial fraction of the total known to breed in the state. The five omitted species are all in the category with (at present) very restricted breeding ranges in West Virginia; the Blue Grosbeak (Guiraca caerulea), Dickcissel (Spiza americana), Lark Sparrow (Chondestes grammacus), Bachman's Sparrow (Aimophila aestivalis), and the White-throated Sparrow (Zonotrichia albicollis). Indeed, it is doubtful if the Lark Sparrow may still be considered as a breeding bird in West Virginia. In addition to these, two birds on the gross list (but not on the contributing list), the Red Crossbill (Loxia curvirostra) and the Pine Siskin (Spinus pinus) have not been actually found breeding in the state. Several of the sparrows of the open grassland habitats have not been found on the contributing list.

The troupials seem to be poorly represented but the four missing species, while common in the state, are not usually found in the habitats investigated. These are the Bobolink (Delichonyx oryzivorus), Orioles (Icterus spurius and I. galbula), and the Common Grackle (Quiscalus quiscula). In addition the Cowbird, while definitely breeding on many of the census areas, does not present a population susceptible to determination by our methods.

Three passerine families are unrepresented: the House Sparrows, the Shrikes, and the Swallows. Several species of Swallows have been recorded as visitors flying over the areas but in view of the breeding habits of these birds and the complete omission of man-made habitats from the studies it is not surprising that none have been recorded as residents.

#### Distributional Analysis of the Species List

Table III shows the distribution of species in the various areas for both the gross and contributing lists.

Table III

Frequency of Occurrence of Species in Various Areas

<u>No. of Areas</u>	<u>Number of species occurring</u>	
	<u>Gross List</u>	<u>Contributing List</u>
17	1	-
15	2	1
14	1	1
12	1	2
11	2	-
10	4	3
9	6	1
8	8	3
7	6	5
6	7	8
5	15	10
4	9	11
3	6	9
2	14	10
1	26	24

Superficially the results seem reasonable as it is to be expected that few species will be found in many areas and that many species will be found in only a few areas; however, the minor fluctuations in the values make further analysis difficult. The plant ecologists have used a technique which is useful here to subject the data to a more exacting test (Oosting - 1950). The number of species falling in each of five classes is computed: 1. Those occurring in 0-20% of the areas; 2. Those occurring in 21-40%; 3. Those occurring in 41-60%; 4. Those occurring in 61-80%; and 5. Those occurring in 81-100%. The number of species in each of these two classes is given in Table IV, again for the two lists.

Table IV

Numbers of Species in the Five Occurrence Classes

<u>Class</u>	<u>Gross List</u>	<u>Contributing List</u>
I (0-20% of areas)	55	54
II (21-40% of areas)	36	26
III (41-60% of areas)	13	7
IV (61-80% of areas)	3	2
V (81-100% of areas)	1	0

The numbers of species in the various classes are then plotted as a bar graph against the class numbers as shown in Figures 1 and 2. The appearance of the

Fig. 1 Gross List

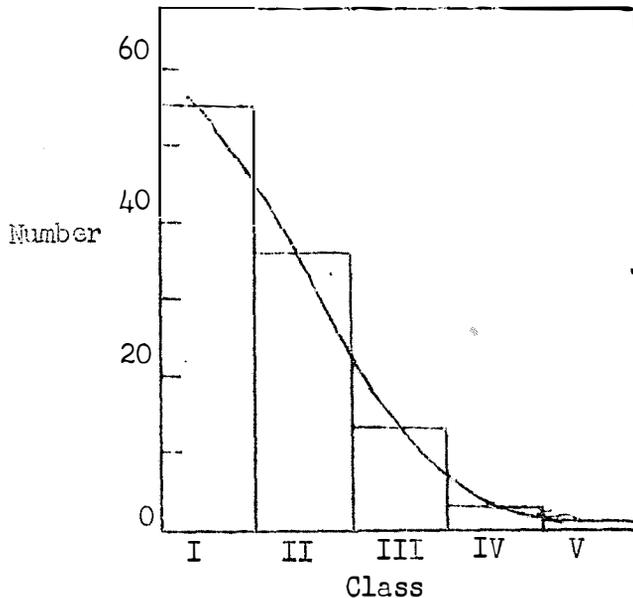
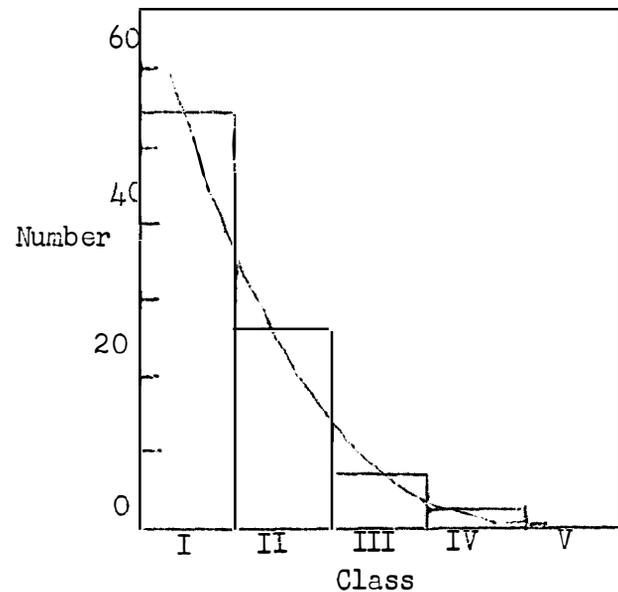


Fig. 2 Contributing List



bar graphs is typical of many counts made with plants and if the data are reasonably accurate a curve drawn through the midpoints of the bars should approximate half of the bell-shaped normal distribution curve. As is seen the present data do this reasonably well. There is a suggestion from the shape of the curve, however that on the contributing list too many species fall into the Class I which might indicate that in some cases species were assigned numerical populations which might better have been included in the "plus" category.

It is of interest to examine the extreme species, that is those which occur in few areas, to be called here intolerant species and those occurring in many areas, to be called here tolerant species.

#### Tolerant or Widespread Species

Examination of the data reveals that seven species are found in at least half the study areas, but only four species contribute numerical population counts to at least one half the areas. This result is somewhat distorted by the bias in selecting the study areas since most of these are forested areas. If more brushy or open areas had been included, fewer species would have been classified as tolerant on this basis.

It is not surprising that the Red-eyed Vireo (Vireo olivaceus) is the most wide-spread species, being found in 17 areas and contributing to the population of 15. The bird is missing from only the two young spruce areas, the marsh, and the overgrown pasture, and it did not contribute to the population of the brushy field or the orchard. This species then can be seen to have a wide tolerance for type of forest and age class. Populations are low, however, in the mature coniferous forest.

The Wood Thrush (Hylocichla mustelina) occurs in 15 areas (missing from the young spruce areas, the marsh, the brushy field, the over-grown pasture, and rather oddly from one of the oak-pine areas) and contributes to the population of 14 areas (the missing one is again another oak-pine area). It is apparently

anomalous that this species should be absent from the two oak-pine areas in Hardy County in 1955 but the general population of this species was not high in that region in that year. Like the Vireo the Wood Thrush is tolerant of most all types and age classes but it contrasts with the Vireo in that the populations in each area are not usually high.

After considering the two leaders which are birds of the more mature forest, it is surprising that the third most tolerant bird is a species of the brushy edges, habitats which are poorly represented. The Towhee (Pipilo erythrophthalmus) appears in 15 areas and contributes to 12. The missing areas are the virgin spruce-hardwoods, mature northern hardwoods, virgin hardwoods-white pine, marsh, and the two mature central hardwoods areas and it does not contribute to the orchard, the central hardwoods ridge, or the oak-pine ridge. It is likely that the wide occurrence of this species is explained by the nature of some of the study tracts. In many cases these were laid out along existing trails or old roads and such breaks in the normal plant cover would possibly supply a long narrow strip of more brushy habitat for the Towhee.

The Scarlet Tanager (Piranga olivacea) another bird of the mature forest but with wide limits of tolerance for forest type, occurs in 14 areas and contributes to 12. The areas from which it is missing are the expected ones, the young forest types and the open or semi-open areas.

Even though most of the areas studied represent marginal habitats for it the Robin (Turdus migratorius) appears in 12 areas and contributes to 10. In no case is the population very high. There is little regularity in the areas from which it is missing. Such a situation is to be expected for this very tolerant bird.

Despite the dominance of the Wood Warblers in all areas it is noteworthy that none fall in the first five most tolerant species. The next three species are Warblers, however, but they are found in only about half of the areas. The Black and White Warbler (Mniotilta varia) occurs in 11 and contributes to 10, the Black-throated Green Warbler (Dendroica virens) occurs in 11 and contributes to only 8, and the Ovenbird (Seiurus aurocapillus) occurs in and contributes to 10 areas. This is the situation to be expected for a group which has evolved into so many diverse forms. Intraspecific competition must be high and most species have adapted themselves for highly specialized niches. The Black and White Warbler, a bird of the mature forest but not partial to forest type, is missing only from the young forests and more open areas. This is also true for the Ovenbird although it is also missing from one or two areas more mature forest where apparently the understory is not adequate (Hall - 1955).

The Black-throated Green Warbler is missing from these same areas as well as from some mature areas which are outside its normal geographical or altitudinal range. It has been pointed out many times before (Brooks - 1944; DeGarmo - 1949; Hall - 1952) that in West Virginia this bird is very little dependent upon the presence of conifers, and we see this borne out in the present study by the variety of habitats in which it has been found. Indeed, it was the dominant bird in both the mature northern hardwoods and in the second-growth central hardwoods, areas in which conifers were almost completely lacking. In regions more near the center of the geographical range of this species it is indeed a bird of the mixed hardwood-conifer forest but here at the periphery of its range it is apt to occur in more unusual places. It seems likely that this species may be considered a relict in much of its West Virginia range. It was formerly widespread in glacial or post-glacial times when the extent of the coniferous forest was much greater

in this region and with the gradual disappearance of that type of forest it has been able to adapt itself to other habitats and apparently has found no numerous competitors within its new niche. Perhaps its presence has indeed prevented the influx of such competitors.

It is of interest to note the species which are missing from the above list of tolerant or widespread species. If asked to name the most common woodland birds of West Virginia it is likely that most informed persons would name: the Red-eyed Vireo, the Redstart (Setophaga ruticilla), the Ovenbird, and the Indigo Bunting (Passerina cyanea). Both the Redstart and the Bunting, which are missing from the list of tolerant species, were found to occur in only five areas. The Bunting is, of course, a bird of the brushy woods and as has been pointed out this habitat is not well represented in the studies. The case of the Redstart is more difficult to understand and no simple explanation presents itself. It is a bird of the forest intermediate between brush and mature but such areas have been studied. It is also true that the bird has been found to be uncommon in the whole region of some of the studies, notably the Cheat Mountain region where five of the areas are located.

#### Intolerant or Restricted Species

Species which occur or contribute to three or less areas have been classified as intolerant. As is to be expected the number of these is large. There appear to be four principal reasons for the limited occurrence of these species: (1) species of restricted habitat types in which few studies have been made, truly intolerant birds; (2) species which are very rare in West Virginia; (3) species which while not rare have a very restricted geographic range in the state; and (4) species whose territories are so large that they will usually not be found to contribute to the small areas studied. These categories are not mutually exclusive and some species may fall into more than one.

In the category of truly intolerant species the following have been listed: American Bittern (Botaurus lentiginosus), Killdeer (Charadrius vociferus), Spotted Sandpiper (Actitis macularis), Belted Kingfisher (Megascops alcyon), Traill's Flycatcher (Empidonax traillii), Horned Lark (Eremophila alpestris), Short-billed Marsh Wren (Cistothorus platensis), Brown Thrasher (Toxostoma rufum), Bluebird (Sialia sialis), White-eyed Vireo (Vireo griseus), Yellow Warbler (Dendroica petechia), Meadowlark (Sturnella magna), Redwing, Savannah Sparrow (Passerculus sandwichensis), Grasshopper Sparrow (Ammodramus savannarum), Henslow's Sparrow (Passerherbulus henslowii), Vesper Sparrow (Pooecetes gramineus), and Swamp Sparrow (Melospiza georgiana). Some of these species are not particularly intolerant when their overall range is considered but may be classified as so on the basis of the present analysis.

Rare birds or birds of restricted range in the state are: Yellow-bellied Sapsucker (Sphyrapicus varia), Olive-sided Flycatcher (Nuttallornis borealis), Red-breasted Nuthatch (Sitta canadensis), Brown Creeper (Certhia familiaris), Winter Wren (Troglodytes troglodytes), Olive-backed Thrush (Hylocichla ustulata), Golden-crowned Kinglet (Regulus satrapa), Swainson's Warbler (Limnithlypis swainsonii), Nashville Warbler (Vermivora ruficapilla), Northern Waterthrush (Seiurus noveboracensis), Mourning Warbler (Oporornis philadelphia), Pine Siskin and Red Crossbill.

The birds of large territories included: Red-shouldered Hawk (Buteo lineatus), Marsh Hawk (Circus cyaneus), all gallinaceous birds, all owls, and to a lesser extent the Flicker (Colaptes auratus), and Pileated Woodpecker.

Some of the species on the intolerant list fail to fit into any one of the categories, examples being Least Flycatcher (Empidonax minimus), Bewick's Wren (Thryomanes bewickii), and Golden-winged Warbler (Vermivora chrysoptera). In such cases a combination of several of the four factors is playing an important part, and it is not possible to settle one primary cause.

Appendix

Table V

A List of the Population Study Areas in West Virginia - 1948 - 55

<u>Habitat Type</u>	<u>County</u>	<u>Elevation</u>	<u>Year</u>
Virgin Spruce-Northern Hardwoods	Randolph	4100 ft.	1948, 53
Young Spruce	Randolph	4400	1948, 53
Mature Northern Hardwoods	Pocahontas	4000	1948, 53
Young Northern Hardwoods	Randolph	4100	1948, 53
Northern Hardwoods-Hemlock River Bottom	Pocahontas	3000	1948
Oak-Pine Second Growth	Berkeley	600	1949
Apple Orchard	Berkeley	600	1949
Virgin White Pine-Hardwoods	Greenbrier	1900	1950
Virgin Cove Hardwoods	Greenbrier	1900	1950
Young Spruce Plantation	Tucker	3750	1951
Young Northern Hardwoods	Tucker	3700	1951
Partly Wooded Marsh	Tucker	3200	1951
Brush Field	Tucker	3100	1951
Second Growth Central Hardwoods Ridge Top	Wayne	1200	1952
Mature Central Hardwoods	Wayne	800	1952
Central Hardwoods River Bottom	Wayne	750	1952
Disturbed Central Hardwoods Stream Bottom	Fayette	1300	1954
Brushy Strip-mined Area	Fayette	1500	1954
Second Growth Oak-Pine	Hardy	1100	1955
Young Oak-Pine	Hardy	1600	1955
Pasture Overgrown in Cedar	Hardy	950	1955

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## FIELD NOTES

1956THE SPRING SEASONApril 1 to June 30

Most observers reported a fine spring migration for the first time in several years. A record number of species was observed and the numbers of most species was high. It was not however, a "normal" season.

Winter seemed reluctant to leave, and although early April was warm the cold weather soon returned and much of the middle of the month was cold and wet. Snow fell at places as late as April 23. The Pittsburgh, Pa. weather station reported an excess of 1.12 inches of rain for the month and an average daily temperature of two degrees below normal. The cold weather broke about April 25 but after a brief warm spell, the weather was again unseasonably cool and wet. May was cooler than normal and much wetter than normal - with rain every day until the middle of the month and a two inch excess in rainfall for the month. June was cooler than normal with about normal rainfall. One hot spell occurred in middle June.

At the end of March the migration was already behind and it continued to move slowly in early April. The mid-month cold weather stopped movement completely and most of the species expected during April were late in arriving. The break in the cool weather in late April produced a tremendous influx of birds which arrived on April 27-29 (fortunately for most birders, a weekend). All the overdue species, all the ones expected for that period and a few not due until a week or two later arrived in one big wave. Observers afield that weekend found a record number of first arrivals. The cooler weather in early May slowed but did not stop the migration and another big influx, this time both in species and in numbers, arrived on May 12-13 (again a weekend). The migration remained in full swing until about May 25 and a few stragglers were still going through at the end of the month. Several observers reported amazing concentrations of birds but the most interesting came from Presque Isle, Pa. on the southern shore of Lake Erie. On May 19, H. Heimerdinger witnessed a remarkable concentration of birds exhausted from beating against a strong north wind as they attempted to cross the Lake.

The only observer who commented on the June breeding season was B. Van Cleve who reported low numbers of breeding birds in the Pittsburgh, Pa. region.

The season produced its share of rarities including Snowy Egret, Yellow-crowned Night Heron, Goshawk, Franklin's Gull, Bohemian Waxwing, Blue Grosbeak, and Smith's Longspurs.

COMMON LOON: No heavy flight anywhere. There were some late records; May 6 at Pymatuning Lake, Pa. (Heimerdinger), May 6 and 13 at Morgantown (G. Hall); and May 28 at Youngstown, O. (V. McLaughlin).

HORNED GREBE: Scattered reports and apparently a light flight.

EARED GREBE: Two seen near Columbus, Ohio in April (H. Burt).

- DOUBLE-CRESTED CORMORANT: An unusual spring record at Morgantown when two were seen on May 6 (Hall).
- GREAT BLUE HERON: McLaughlin reported three nesting sites in Mahoning County, O.
- AMERICAN EGRET: Reported from Barnesville, O. April 23 (Mrs. D. Cain and Mrs. H. Chapman) and from Youngstown, O. April 20 and May 20 (McLaughlin).
- SNOWY EGRET: L. Barbour reported one at Painesville, O. May 20. A very unusual record at any time for that region and all the more remarkable for a Spring record.
- YELLOW-CROWNED NIGHT HERON: One seen at Youngstown, O. May 11 and 12 was the second record for that location (McLaughlin and Heimerdinger). Since this species was found nesting near Columbus, O. recently it may be that it is going to turn up in our area more often in the future.
- LEAST BITTERN: Only one report; from Westmoreland Co. Pa. on May 6 (D. & C. Auerswald and J. Beatty vide Van Cleve). For the first time in several years the B.B.C. field trip group failed to find it in the Eastern Panhandle.
- WATERFOWL: The migration continued well into April and at some places the peak came in early April. Many species lingered in our region well past their normal departure times.
- WHISTLING SWAN: Late March had seen a fine flight in the Youngstown, O. region and these birds were still present in early April (McLaughlin). Very late records were: Westmoreland Co. Pa. on April 22 (Auerswald); Presque Isle, Pa. on April 23 and Pymatuning Lake, Pa. on May 6 (Heimerdinger) and Columbus, O., in early May (Burt).
- SNOW GOOSE: M. Skaggs saw one near Cleveland, O. on April 14.
- EUROPEAN WIDGEON: Three records for this species in one season is rather unusual. Heimerdinger saw one at Youngstown, O. on April 13 and E. Gressel saw one in the same region the same day. Hall found one at Deep Creek Lake, Md. on April 9.
- WOOD DUCK: J. Appel reported that the first brood left the nest on May 5 at the McClintic Wildlife Station at Point Pleasant and that 39 broods were raised there this year.
- REDHEAD: A moderately unusual record was of a female seen at Wheeling on June 30 (T. Shields).
- AMERICAN GOLDENEYE: There were two rather late departure records; April 15 at Morgantown (Hall) and April 20 at Pittsburgh (Van Cleve).
- WHITE-WINGED SCOTER: Van Cleve found one at Highland Park, Pittsburgh, Pa. on April 26. Unusual as to location and remarkable as to date.
- HOODED Merganser: Appel saw a brood of eight young at Point Pleasant on May 19. To the writer's knowledge this is only the second breeding record for West Virginia.

- RED-BREASTED MERGANSER: There were three rather late records: May 7 at Bluefield (Mr. M. Dickinson), May 13 at Morgantown (Hall) and May 19 at Presque Isle, Pa. (Heimerdinger).
- HAWKS: Apparently this has not been a very good season as few reports of the commoner species were received.
- GOSHAWK: Shields reported one at Bearden Knob. Tucker Co. on June 6.
- RED-SHOULDERED HAWK: The B.B.C. group observed an unusual number along a short stretch of road in Pocahontas County on April 21. Shields found a nest at Wheeling on April 22.
- ROUGH-LEGGED HAWK: Heimerdinger observed a black-phased individual at Presque Isle, Pa. on May 19.
- BALD EAGLE: McLaughlin reports that the nesting eagles in the Youngstown, O. region have disappeared after having nested there for 17 years.
- OSPREY: More than the usual number of reports from all over the region.
- PIGEON HAWK: One at Morgantown on May 13 (Hall) was very unusual for that location.
- GALLINACEOUS BIRDS: Shields reports that the Bobwhite have increased over last year in the Wheeling region and Barbour reports that they continue to do well in Northern Ohio. In late June C. Handley found that Wild Turkey broods in West Virginia were few in number and that the broods were small. Many of the young were quite small indicating late broods. The wet cool late May and June probably is responsible for this.
- KING RAIL: Only one record: Shields and C. Conrad saw one at Altona Marsh in Jefferson County on May 20.
- VIRGINIA RAIL: The B.B.C. group saw one at Altona Marsh on May 20 and Chapman and Cain reported one from Barnesville, O. on June 6.
- SHOREBIRDS: The wet spring produced bodies of water that were bank-full and had few mud flats. The flight was low in numbers although seventeen species were reported.
- BLACK-BELLIED PLOVER: Heimerdinger saw one, Youngstown, O., on May 20 and Shields saw one at Wheeling on June 4.
- GOLDEN PLOVER: A flock of 30 seen at Painesville, O. on April 15 (P. Smith fide Barbour) was a most unusual record.
- RUDDY TURNSTONE: Not usually reported in the Spring, there were three records: one at Barnesville, O. on May 12 (Cain & Chapman); three at Presque Isle, Pa. on May 19 and one at Youngstown, O. on May 20 (Heimerdinger).
- DOWITCHER: Five at Barnesville, O. on May 12 (Cain & Chapman) and one at Painesville, O. on May 13 (Barbour).

- FRANKLIN'S GULL: Heimerdinger saw four near Youngstown, O., on May 4 and one at Pymatuning Lake, O., on May 5; most unusual records.
- BONAPARTE'S GULL: Several reports as usual from Lake Erie but the following inland records are notable. "Plentiful" at Barnesville, O. on April 1 (Chapman and Cain) and seen at Morgantown on April 3 (E. McCue).
- COMMON TERN: Thirty seen at Barnesville, O. on May 12 (Chapman & Cain) and twenty at Youngstown, O. on May 22 (Heimerdinger). One at Cheat Lake, Morgantown on May 13 was unusual (Hall). Heimerdinger found them nesting in numbers at Presque Isle, Pa. on June 29.
- CASPIAN TERN: Two reports from Lake Erie; April 20 at Cleveland, O. (Shields) and April 23 at Presque Isle, Pa. (Heimerdinger).
- BLACK TERN: Twenty seen at Barnesville, O. on May 12 (Cain & Chapman); one at Morgantown where they are unusual on May 13 (Hall); and Shields saw one at Mountain Lake Park, Md. where they have nested in the past on June 5.
- CUCKOOS: Both species were quite late in arriving and were in low numbers.
- BARN OWL: This species is rarely reported but presumably is more common than the records indicate. Hall heard one at Morgantown on May 6 and R. Bell reported two nests at Clarksville, Pa.
- WHIP-POOR-WILL: A very early arrival was April 4 at Charleston (Mr. & Mrs. G. Ballentine fide G. Hurley). Elsewhere the arrival was with the big wave of April 27-29.
- NIGHTHAWK: An extremely early report from Wheeling on April 15 (M. & L. Gorman). Elsewhere arrival was more normal from May 2 at Pittsburgh, Pa. (J. Grom fide Van Cleve) to May 21 at Barnesville, O. (Cain & Chapman).
- CHIMNEY SWIFT: Arrived quite late in most places. A few birds were seen at near normal dates: April 7 at Barnesville, O. (Chapman & Cain) and Wheeling (Gormans), and April 22-23 at Point Pleasant (Hurley), Charleston (Handley) and Morgantown (McCue). The majority of the birds did not arrive until the big influx on April 27-29.
- RUBY-THROATED HUMMINGBIRD: One at Barnesville, O. on April 12 (Cain & Chapman) With much cold weather still to come, one can only speculate about the probable fate of this bird.
- KINGBIRD: The earliest date was April 28 at Wheeling (Shields), Morgantown (Hall) and Barnesville, O. (Cain & Chapman). In southern West Virginia, oddly enough, the arrival was somewhat later: May 1 at Beckley (R. Kletzley) and May 2 at Bluefield (Dickinson).
- CRESTED FLYCATCHER: The earliest date was April 22 at Wheeling (G. Phillips): April 27-29 at Charleston (D. Shearer), Barnesville, O. (Chapman & Cain) and Pittsburgh, Pa., (Grom); but not until May 7 at Bluefield (Dickinson) and Clarksville, Pa., (Bell). Low in numbers at Morgantown (Hall) and Pittsburgh, Pa. (Van Cleve).

- YELLOW-BELLIED FLYCATCHER:** A banner year for this species which is rarely reported in the spring. An extremely early date was April 28 at Wheeling (Shields). Reports came from Pittsburgh, Pa. on May 19 (Van Cleve), Presque Isle, Pa. on May 19 (Heimerdinger); Barnesville, O. on May 20 (Chapman & Cain) and East Liverpool, O. on May 28 (N. Laitsch).
- ALDER FLYCATCHER:** This species had a good year and seems to be extending its range in our region. Phillips and Shields had several records near Wheeling where Shields found a nest on June 10. Unusual were the records from East Liverpool, O. on May 28 (Laitsch) and Chester on June 22 (E. Chandler). Bell found a nest at Clarksville, Pa. on June 27.
- OLIVE-SIDED FLYCATCHER:** The only report was from Youngstown, O. on May 20 (Heimerdinger).
- TREE SWALLOW:** Earliest date was April 8 at Barnesville, O. (Cain & Chapman) but elsewhere April 20 (Beckley-Kletzley to April 23 (Point Pleasant-Hurley). Unusually scarce at Morgantown (Hall).
- BANK SWALLOW:** Only four records; May 3 at McKeesport, Pa. (J. Wilkinson) May 3 at Point Pleasant (Hurley); May 19 at Presque Isle, Pa. (Heimerdinger) and May 26 at Barnesville, O. (Chapman & Cain).
- BARN SWALLOW:** Arrival dates were from April 2 at Clarksville, Pa. (Bell) the earliest on record for Western Pennsylvania to April 14 at Morgantown (Hall) and Wheeling (Shields).
- BLUEJAY:** Laitsch reports nesting at East Liverpool, O., the first such occurrence she is aware of in that region.
- RAVEN:** A nest was found in Hardy County on May 3 by K. Anderson and other Conservation Commission personnel.
- RED-BREASTED NUTHATCH:** Scattered records from all over the region including an unusual one for Hancock County on June 6 (Shields).
- BROWN CREEPER:** Apparently a poor Spring flight. Only one bird heard on Gaudineer Knob on May 26 (Hall).
- HOUSE WREN:** The earliest report was April 22 at Morgantown (McCue). Other arrival dates were all for the weekend of April 27-29 which is late.
- BEWICK'S WREN:** Arrived at Bluefield on April 5, which is late (Dickinson). An unusual record was one at Gibsonia, Pa., on April 22 (Grom).
- LONG-BILLED MARSH WREN:** Only one record, Barnesville, O. on May 28 (Chapman & Cain).
- SHORT-BILLED MARSH WREN:** Only one record, Latrobe, Pa., on May 6 (Auerswalds).
- MOCKINGBIRD:** Several reports from the Cleveland, O. region, May 13 at Painesville, O. (Barbour) and May 16 at Willoughby, O. (Skaggs). The ones that wintered near Wheeling remained into June (Shields).

- BROWN THRASHER:** Arrival dates were scattered from April 2 at Charleston (Ballentines) and April 2 at Pittsburgh, Pa, early (Gron) to April 17 at Morgantown (McCue) and April 28 at Clarksville, Pa., (Bell).
- CATBIRD:** Arrival was from April 27-29 with seven stations reporting April 28. This was late for the southern part of the region but about normal for the northern part.
- THRUSHEES:** All observers commented on the unusually heavy migration.
- WOOD THRUSH:** The earliest date was April 4 at Charleston (Hurley) but at most places they arrived on April 27-28, somewhat late.
- HERMIT THRUSH:** An unusual late record was one at Highland Park, Pittsburgh, Pa., until May 26 (Van Cleve).
- OLIVE-BACKED THRUSH:** A very heavy flight in most places. Arrival was with the April 27-28 influx which is about normal or a little early in some places. On May 14 Gron saw over 100 at Gigsonia, Pa. Skaggs reported a heavy flight at Willoughby, O. on May 12-13. Heimerdinger found them to be the most common bird in the large concentration at Presque Isle, Pa. on May 19.
- GRAY-CHEEKED THRUSH:** Many more reports than usual. Seen at Ligonier, Pa. on the very early date of April 23 (Luerswalds) and April 30 at Barnesville, O. (Cain & Chapman). Elsewhere the dates ranged from May 6 to 16.
- VEERY:** A very early record in Greenbrier County on April 5 (Kletzley). Most dates ranged from April 28 at Wheeling (Shields) and East Liverpool, O. (Laitsch) to May 6 at Terra Alta (Hall). Chandler found one at Chester where they are rare on May 6.
- BLUE-GRAY GUNTCATCHER:** April 5 at Charleston (J. Woods) and April 7 at Wheeling were about normal but elsewhere they were up to two weeks late. At Bluefield nest building did not start until the relatively late date of April 27 (Dickinson).
- WATER PIPIT:** Only two reports: eight at Clarksville, Pa. On March 24 (Bell) and eight at Willoughby, O. on May 16 (Skaggs).
- BOHEMIAN WAXWING:** One of the best records of the year. Eleven were seen flying over and three at a feeding station in East Liverpool, O., April 12; seen there also on April 14 (Laitsch).
- VIREOS:** A normal season, most arriving on time and in good numbers. The Blue-headed was late at most stations not being reported until April 28.
- PHILADELPHIA VIREO:** An unusual number of spring records for this species: One in Beaver Co., Pa. on May 13 (J. Lester) and one at Barnesville, O. on May 13 (Cain & Chapman); several at Presque Isle, Pa. on May 19 (Heimerdinger) and one in the Eastern Panhandle on May 19 (B.B.C.). Two at Highland Park, Pa. on May 20 and one on May 13 (Van Cleve).
- WARBLERS:** In most areas the flight was good and in some places it was very good to exceptional. The only exception apparently was at Youngstown, O. where

McLaughlin reported a rather sparse season. In all the only species of eastern United States that were not reported were the very rare Bachman's and Kirtland's. Except for a few Myrtles and the Louisiana Waterthrush the species expected for mid-April did not show up. The second group of species to be expected around May 1 arrived with a bang on April 27-29 and this influx brought in the tardy first group also. The third group expected for mid-May arrived in force on May 12-13 and this period brought the peak numbers also. Migration then extended into the last week in May. Several large concentrations were reported. Skaggs commented that the wave on May 12-13 at Willoughby, O. was the best since 1943, and Barbour also commented on the wave in that region on May 13. In a small area in Highland Park, Pa. on May 13 in an hours time Van Cleve counted about 1000 individuals, 50% being Tennessees and thirty per cent Bay-breasts. Heimerdinger did not report any counts but found large numbers at Presque Isle, Pa., May 19. The following accounts can touch only the high spots and no attempt is made to be complete.

- BLACK & WHITE WARBLER:** Not a good year: low in numbers at Wheeling (Shields), Pittsburgh, Pa. (Van Cleve) and Morgantown (Hall).
- PROTHONOTARY WARBLER:** One at Youngstown, O. on April 30 (McLaughlin) and one at Wheeling on May 13 (Shields). The B.B.C. group found four or five singing males along the Shenandoah River on May 19-20 and located a nest there.
- WORM-EATING WARBLER:** One at Youngstown, O. on April 28 was only the second Mahoning County record (McLaughlin & Heimerdinger).
- BLUE-WINGED WARBLER:** Unusually common at North Park, Pa. this year (B. Scheidel *vide* Van Cleve). A singing male at Morgantown from April 29 to at least May 13 was unusual (Hall.)
- BREWSTER'S WARBLER:** Chapman and Cain saw one of these hybrids at Barnesville, O. on May 5.
- TENNESSEE WARBLER:** An early record at Pittsburgh, Pa. on April 29 (Van Cleve).
- ORANGE-CROWNED WARBLER:** Two records: May 4 at Morgantown (McCue) and May 11 at Barnesville, O. (Cain & Chapman).
- NASHVILLE WARBLER:** The best flight in several years. Van Cleve reported that they were the second most abundant warbler at Pittsburgh, Pa.
- YELLOW WARBLER:** Arrived at Bluefield on April 25, the latest date on record (Dickinson). Elsewhere arrival was April 27-29. Still migrating in numbers at Presque Isle, Pa. on May 19 (Heimerdinger).
- CAPE MAY WARBLER:** Arrived about on time but was low in numbers at most places.
- BLACK-THROATED BLUE WARBLER:** Rare at Wheeling this species was seen there on May 5 (Shields).
- MYRTLE WARBLER:** Arrival varied from early at Pittsburgh, Pa. May 22 (-Van Cleve); to on time at Bluefield (April 12-Dickinson) and Morgantown (April 15-Hall) to late at Wheeling (April 28-Shields).

- BLACK-THROATED GREEN WARBLER: Arrival was on April 28 at practically all stations, a little late.
- BLACKBURNIAN WARBLER: Normal arrival and a good flight.
- BAY-BREASTED WARBLER: A very good flight at all stations. Grom estimated that he saw at least 1200 at Gibsonsia, Pa. on May 12.
- YELLOW-THROATED WARBLER: Rarely reported, this species was seen at Point Pleasant on May 5 (Hurley).
- BLACKPOLL WARBLER: An early record at Wheeling on May 5 (Shields). The flight was light in most places.
- PINE WARBLER: One at Cleveland, O. where it is rare on May 12 (Skaggs).
- PRAIRIE WARBLER: This is a rare bird in western Pennsylvania but two records came in: April 29 at Clarksville (Bell) and May 6 at Latrobe (Auerwalds). This first known breeding record for Marshall County was established when B. Shields found recently fledged birds there on June 13.
- LOUISIANA WATERTHRUSH: The only mid-April species which arrived on time.
- CONNECTICUT WARBLER: Only one report, Presque Isle, Pa. on May 19 (Heimerdinger).
- MOURNING WARBLER: One at Pittsburgh, Pa. where it is rare, from May 6 to 23 (Van Cleve). One in Wheeling in mid-May (G. Breiding) and seen at Barnesville, O. where it is rare on May 24 (Cain & Chapman). The B.B.C. group saw one in Berkeley County on May 19. Hall was able to locate only one singing male on the Cheat Mountain breeding grounds, May 25-26.
- WILSON'S WARBLER: A very fine year with reports of good numbers coming from all over the region.
- BOBOLINK: The earliest arrival was April 28 at East Liverpool (Laitsch) and the latest May 10 at Clarksville, Pa. (Bell).
- ORCHARD ORIOLE: Many more reports than usual. Seen in Cleveland, O. where it is rare on May 19 (Skaggs). Shields found a nest at Wheeling on June 10.
- RUSTY BLACKBIRD: Seen at Pymatuning Lake, Pa. as late as May 6 (Aud. Soc. of West. Penna vide Van Cleve).
- COMMON GRACKLE: Phillips reported nesting underway at Wheeling on April 5.
- SCARLET Tanager: Arrival dates were April 22 at Bluefield (Dickinson) to May 5 at East Liverpool, O. (Laitsch). The late development of the foliage made this bird conspicuous and many non-birding people commented on seeing a "Black-winged redbird".
- SUMMER Tanager: The only report from outside its normal range came from Gibsonsia, Pa. on June 11-17 (Grom).

BLUE GROSBEAK: A very unusual record was one at Gibsonia, Pa. on May 15 (Grom).

INDIGO BUNTING: This species arrived in numbers with the April 27-29 wave which is a little early.

DICKCISSEL: Chandler found one at Chester on May 19 and the B.B.C. group saw at least five in a field near CharlesTown on May 20.

EVENING GROSBEAK: Still in the vicinity of Cleveland, O. on April 14 (Barbour) and L. Schwab reported them at Kingwood until May 1.

PURPLE FINCH: A good flight in late April in most places.

PINE SISKIN: Heimerdinger reported a flock of around 500 at Youngstown, O. on April 11 and several there on April 28. Reported from East Liverpool, O. on May 9 (Laitch) and Pymatuning Lake, Pa. on May 6 (Aud. Soc. of West Penna.)

WHITE-WINGED CROSSBILL: Twenty five were with the siskins at Youngstown, O. on April 11 (Heimerdinger).

HEMLOW'S SPARROW: Low in numbers in the Cleveland, O. region (Skaggs). Appeared again at the Bear Rock Lake region at Wheeling (Phillips and Shields) and Shields found a nest there on June 30.

BICHLIN'S SPARROW: The B.B.C. group found one at Jefferson County on May 19.

JUNCO: Last seen dates ranged from April 29 at Wheeling (Phillips) to May 20 in Beaver County, Pa. (Lester).

CHIPPING SPARROW: Arrival dates were April 1 at Beckley (Kletzley) and Charleston (J. Handlan) to April 11 at Morgantown (McCue & Hall). However, not recorded at Bluefield until the very late date of April 18 (Dickinson).

TREE SPARROW: April 28 at Clarksville, Pa. (Bell) and April 30 at East Liverpool, O. (Laitch) were late departure dates.

WHITE-CROWNED SPARROW: A good flight in most places, from April 27 to May 18. Skaggs banded a bird of the Gambel's subspecies at Willoughby, O. on May 13.

WHITE-THROATED SPARROW: After two springs of low numbers the flight was normal in most places and the birds were seen as late as May 21 at Clarksville, Pa. (Bell)

FOX SPARROW: Two late dates were April 22 at Pittsburgh, Pa. (Van Cleve) and April 30 at Wheeling (Gorman).

LINCOLN'S SPARROW: Present at Clarksville, Pa. from May 10 to 15 (Bell). Unusually common at Morgantown on May 13 (Hall).

SMITH'S LONGSPUR: Several seen south of Columbus, O. (Burt).

Note: Unless otherwise designated, all places in the above account are to be understood as referring to the state of West Virginia.

George A. Hall  
Morgantown, West Virginia

Contributions for the Season, July 1 to September 30 are due on October 10.