

Warbler Overview

Thirty-six warbler species occur regularly in Indiana and four additional species have been recorded. The four species of less than regular occurrence are Black-throated Gray, Townsend's, Kirtland's, and Swainson's. Of the regular warblers approximately 20 are summer residents and 16 are migrants. Indiana's most abundant warbler is the Yellow-rumped, which comprises some 23 percent of all warblers counted in the state.

Warbler Abundance

Statewide abundances of all 40 Indiana warblers are listed in Tables 1a and 1b. Abundance is listed as an index, which is the percentage of all-time individual totals multiplied by 1000 (brings numbers within easy handling range). For example, the abundance index for American Redstart is 8034.9, which means that about 8.03% of all warblers are this species. The table also lists the 20-year mean, which is the average annual number of individuals reported over the past 20 years (1986-2005 in this case).

TABLE 1a. WARBLER ABUNDANCE TABLE I							
Arranged in AOU Order (data through fall 2005)							
	Abundance Index	20-yr Mean	Rank		Abundance Index	20-yr Mean	Rank
Blue-winged Warbler	1430.3	128	15/16	Palm Warbler	5841.1	521	6/5
Golden-winged Warbler	504.0	38.3	33/33	Bay-breasted Warbler	2308.2	146	11/14
Tennessee Warbler	6058.3	497	5/6	Blackpoll Warbler	2060.2	192	14/12
Orange-crowned Warbler	457.8	38.2	34/34	Cerulean Warbler	1275.6	109	20/21
Nashville Warbler	2784.5	241	10/10	Black-and-white Warbler	2121.8	187	13/13
Northern Parula	999.9	110	24/20	American Redstart	8034.9	823	2/2
Yellow Warbler	6079.8	597	4/4	Prothonotary Warbler	959.1	71.1	25/27
Chestnut-sided Warbler	2291.6	215	12/11	Worm-eating Warbler	289.9	22.8	35/35
Magnolia Warbler	4914.0	435	7/7	Swainson's Warbler	1.2	0.05	40/40
Cape May Warbler	1421.9	134	16/15	Ovenbird	3329.6	294	8/8
Black-throated Blue Warbler	633.4	49.1	31/32	Northern Waterthrush	1309.4	113	18/19
Yellow-rumped Warbler	22771.9	2114	1/1	Louisiana Waterthrush	788.1	70.6	29/28
Black-throated Gray Warbler	1.9	0.2	38/37	Kentucky Warbler	854.0	71.7	28/26
Black-throated Green Warbler	3173.3	276	9/9	Connecticut Warbler	287.6	19.7	36/36
Townsend's Warbler	1.5	0.1	39/38	Mourning Warbler	634.1	51.4	30/30
Blackburnian Warbler	1225.9	89.7	21/23	Common Yellowthroat	8033.8	801	3/3
Yellow-throated Warbler	1105.4	116	22/18	Hooded Warbler	889.8	92	26/22
Pine Warbler	538.6	49.6	32/31	Wilson's Warbler	1354.9	121	17/17
Kirtland's Warbler	3.5	0.1	37/39	Canada Warbler	1052.3	75.8	23/25
Prairie Warbler	889.0	65	27/29	Yellow-breasted Chat	1287.9	86.7	19/24
Abundance Index: = (100,000xnumber of individuals)÷Total of all individuals (i.e., 1000 times percentage)							
20-year mean: = total number observed (1986-2005) ÷20							
Rank: = Rank order based on: all-time total numbers/20-year means (1986-2005)							

In assessing warbler abundance, rank order is used frequently, as this parameter is less dependent on observer effort than are the total numbers. Within the Abundance Tables, data in the Rank column actually include two values. Numbers on the left are rankings based on comprehensive totals (i.e., the abundance index), whereas, right-hand numbers rank data collected over the last 20 years.

Note that within the ranking lists several species have identical values for both the all-time and 20-year rankings (e.g., Yellow-rumped, Nashville, and Ovenbird) and many more have values within one or two (Blue-winged and Blackburnian). Five species, however, have ranking differences of three or more: Parula, Yellow-throated, Bay-breasted, Hooded, and Chat. These differences in rankings provide an insight into population stability. That is, comparing the all-time and 20-year ranking can give an indication of population changes.

TABLE 1b. WARBLER ABUNDANCE TABLE II							
Arranged by All-Time Abundance (data through fall 2005)							
	Abundance Index	20-yr Mean	Rank		Abundance Index	20-yr Mean	Rank
Yellow-rumped Warbler	22771.9	2114	1/1	Blackburnian Warbler	1225.9	89.7	21/23
American Redstart	8034.9	823	2/2	Yellow-throated Warbler	1105.4	116	22/18
Common Yellowthroat	8033.8	801	3/3	Canada Warbler	1052.3	75.8	23/25
Yellow Warbler	6079.8	597	4/4	Northern Parula	999.9	110	24/20
Tennessee Warbler	6058.3	497	5/6	Prothonotary Warbler	959.1	71.1	25/27
Palm Warbler	5841.1	521	6/5	Hooded Warbler	889.8	92	26/22
Magnolia Warbler	4914	435	7/7	Prairie Warbler	889	65	27/29
Ovenbird	3329.6	294	8/8	Kentucky Warbler	854	71.7	28/26
Black-throated Green Warbler	3173.3	276	9/9	Louisiana Waterthrush	788.1	70.6	29/28
Nashville Warbler	2784.5	241	10/10	Mourning Warbler	634.1	51.4	30/30
Bay-breasted Warbler	2308.2	146	11/14	Black-throated Blue Warbler	633.4	49.1	31/32
Chestnut-sided Warbler	2291.6	215	12/11	Pine Warbler	538.6	49.6	32/31
Black-and-white Warbler	2121.8	187	13/13	Golden-winged Warbler	504	38.3	33/33
Blackpoll Warbler	2060.2	192	14/12	Orange-crowned Warbler	457.8	38.2	34/34
Blue-winged Warbler	1430.3	128	15/16	Worm-eating Warbler	289.9	22.8	35/35
Cape May Warbler	1421.9	134	16/15	Connecticut Warbler	287.6	19.7	36/36
Wilson's Warbler	1354.9	121	17/17	Kirtland's Warbler	3.5	0.1	37/39
Northern Waterthrush	1309.4	113	18/19	Black-throated Gray Warbler	1.9	0.2	38/37
Yellow-breasted Chat	1287.9	86.7	19/24	Townsend's Warbler	1.5	0.1	39/38
Cerulean Warbler	1275.6	109	20/21	Swainson's Warbler	1.2	0.05	40/40
Abundance Index: = (100,000xnumber of individuals)÷Total of all individuals (i.e., 1000 times percentage)							
20-year mean: = total number observed (1986-2005) ÷20							
Rank: = Rank order based on: all-time total numbers/20-year means (1986-2005)							

Values in Table 1 reveal that all-time rankings for Bay-breasted, and Yellow-breasted Chat are lower than the 20-year rankings. The chat, for example, ranks 19th on the all-time list, but falls to 24th over the last 20 years. This suggests that populations of these species have declined in recent years, a contention supported by other information (see individual species accounts).

Similarly Northern Parula, Yellow-throated, and Hooded Warblers have 20-year rankings greater than all-time rankings suggesting population increases. Indeed, 50-year population data support this possibility (see individual species accounts).

Abundances during Migration

Spring and fall migration abundances of the regularly occurring warblers, along with seasonal rankings, are displayed in Table 2. Here, abundances are given in terms of percentages of all warbler individuals. That is, the 1.67% spring value for Blue-winged Warbler means that of all spring warblers counted, this species constitutes 1.67% of the total.

An intriguing aspect of warbler migration is that several species display markedly different abundances between the spring and fall flights. An extreme example is provided by the Yellow Warbler, which ranks second in the spring migration (behind the Yellow-rumped), but plummets to 25th in fall.

TABLE 2: Regularly Occurring Warbler Rankings by Migration (All-time data through fall 2005)									
	Spring		Fall			Spring		Fall	
	%	Rank	%	Rank		%	Rank	%	Rank
Blue-winged Warbler	1.67	15	0.63	21	Bay-breasted Warbler	1.49	17	3.99	8
Golden-winged Warbler	0.55	32	0.51	22	Blackpoll Warbler	1.56	16	3.24	9
Tennessee Warbler	4.78	6	9.32	3	Cerulean Warbler	1.75	14	0.11	34
Orange-crowned Warbler	0.38	34	0.67	20	Black-and-white Warbler	1.96	13	2.65	12
Nashville Warbler	3.19	9	2.98	10	American Redstart	6.46	5	9.55	2
Northern Parula	1.29	22	0.43	24	Prothonotary Warbler	1.10	26	0.16	31
Yellow Warbler	8.00	2	0.41	25	Worm-eating Warbler	0.35	36	0.06	36
Chestnut-sided Warbler	2.35	11	2.43	13	Ovenbird	3.44	8	2.86	11
Magnolia Warbler	3.85	7	7.52	4	Northern Waterthrush	2.02	12	0.70	19
Cape May Warbler	1.16	25	2.12	14	Louisiana Waterthrush	1.18	24	0.11	35
Black-throated Blue Warbler	0.53	33	0.91	17	Kentucky Warbler	1.00	27	0.13	33
Yellow-rumped Warbler	23.40	1	26.87	1	Connecticut Warbler	0.37	35	0.23	30
Black-throated Green Warbler	2.75	10	4.27	7	Mourning Warbler	0.85	29	0.38	27
Blackburnian Warbler	1.34	20	1.30	16	Common Yellowthroat	6.88	3	5.20	6
Yellow-throated Warbler	1.49	18	0.43	23	Hooded Warbler	0.82	30	0.28	29
Pine Warbler	0.59	31	0.39	26	Wilson's Warbler	1.37	19	1.66	15
Prairie Warbler	0.88	28	0.30	28	Canada Warbler	1.32	21	0.76	18
Palm Warbler	6.66	4	6.30	5	Yellow-breasted Chat	1.23	23	0.16	32
% = Percentage of the total number of warbler individuals of all species.									

By comparing the ratio of spring and fall abundances (i.e., data in the “%” columns of Table 2), warblers can be separated into three groups, reflecting relative magnitudes of the spring and fall flights. These groups are tabulated as follows:

TABLE 3: Spring to Fall Ratios	
Description	Spring to Fall Ratio*
Warblers most common in spring	18.0 – 2.26
Warblers in roughly equal numbers each season	1.71 – 0.83
Warblers more common in fall	0.75 – 0.37
* Spring to Fall Ratio = spring “%” ÷ fall “%”	

Warblers in each of these three categories are listed below.

Warblers more common in spring migration

The 14 warblers in this category are primarily breeding species that generally do not nest north of Indiana. The Northern Parula, Yellow, Northern Waterthrush, and Mourning Warbler constitute exceptions to this rule. This group is tabulated below (arranged in order of decreasing ratio).

TABLE 4: WARBLERS MOST COMMON IN SPRING			
Yellow Warbler	Prothonotary Warbler	Northern Waterthrush	Hooded Warbler
Cerulean Warbler	Worm-eating Warbler	Northern Parula	Mourning Warbler
Louisiana Waterthrush	Kentucky Warbler	Blue-winged Warbler	
Yellow-breasted Chat	Yellow-throated Warbler	Prairie Warbler	

Perhaps the most extreme example in this group is the Yellow Warbler, with approximately 18 times as many individuals tallied in spring as in fall. The Cerulean Warbler with a ratio of 15.4 runs a close second.

Warblers with Roughly equal numbers in both flights

This group includes a dozen warblers that are primarily non-breeders (i.e., pure migrants). However, exceptions to this rule include Pine, Common Yellowthroat, Ovenbird, and Chestnut-sided. Warblers in this category are tabulated below (arranged in order of decreasing ratio).

TABLE 5: WARBLERS IN ABOUT EQUAL NUMBERS BOTH MIGRATIONS			
Canada Warbler	Common Yellowthroat	Palm Warbler	Chestnut-sided Warbler
Pine Warbler	Golden-winged Warbler	Nashville Warbler	Yellow-rumped Warbler
Connecticut Warbler	Ovenbird	Blackburnian Warbler	Wilson's Warbler

Species more common in fall

Most of these warblers are “pure” migrants; indeed, only three of these, Black-throated Green, Redstart, and Black-and-white, nest regularly in the state (arranged in order of decreasing ratio).

TABLE 6: WARBLERS MORE COMMON IN FALL			
Black-and-white Warbler	Black-throated Blue Warbler	Cape May Warbler	Bay-breasted Warbler
American Redstart	Orange-crowned Warbler	Tennessee Warbler	
Black-throated Green Warbler	Magnolia Warbler	Blackpoll Warbler	

The Bay-breasted Warbler, with a spring to fall abundance ratio of 0.37, has the lowest value of all warblers.