

## BELL'S VIREO IN INDIANA

BY RUSSELL E. MUMFORD

THE paucity of published data concerning the status of the Bell's Vireo (*Vireo bellii*) in Indiana has prompted this note. During the past ten years, other persons and I have observed the bird in a number of areas over the state. It thus seems advisable to bring all of the records up to date. The records indicate that Bell's Vireo is well-established over a considerable portion of Indiana.

Bent (1950:254) says: "The species, *Vireo belli*, is widely distributed over the western United States and northern Mexico, but the type race is found only east of the Rocky Mountains, from southern South Dakota, northern Illinois, and northeastern [this probably was meant to be northwestern] Indiana to eastern Texas and Tamaulipas." Butler (1897:1179) carried the bird on the hypothetical list for Indiana but noted that Nelson took a specimen at Chicago in 1875. A young female which I collected near Lafayette, Tippecanoe County, Indiana, on August 10, 1951, appears to be the first Indiana specimen. All reports of Bell's Vireo from Indiana known to me (although I have probably missed some unpublished records) are presented, by years, below.

1943

A search of the literature has failed to reveal any Indiana record prior to the one reported by Mrs. W. E. Dittrich (Wright, 1949:54). She saw one at Highland, Lake County, Indiana, on April 30. Charles T. Clark found two Bell's Vireos at Camp Pottawotamie, Tippecanoe River State Park, on July 4. He wrote (in letter), "I heard one singing in some thickets . . . spent the better part of a half hour "running" it down. Finally obtained very close and satisfactory views."

1944

Clark found two birds on the Jasper-Pulaski State Game Preserve, Medaryville, Indiana, July 16. This information was relayed (by letter) to O. D. McKeever shortly thereafter, but was never published. The birds were located "just east of the road bordering the Bob-white pen section," according to Clark (letter to me).

1945

The next record was submitted by Dr. W. E. Ricker (Wright, 1948:48) from the Tippecanoe River State Park. He said, "Saw one pair of Bell's Vireos at Tippecanoe River State Park near Winamac [Pulaski County] in 1945. They raised a young cowbird [*Molothrus ater*] which I saw them feeding. Original identification was made by a local ornithologist of Knox." Clark, who was residing in Knox at this time, informed me by letter that he did not discover this nest. Unfortunately, we are unable to give credit for the first nesting record for the state.

1946

On May 13, Mrs. Dittrich reported Bell's Vireos from Highland. Bell's Vireo was first noted in Marion County that year, also, by Dale W. Rice and several others. They saw two on May 30, at the Geist Reservoir, near Indianapolis, "in a tangled thicket near the water's edge." Val Nolan, Jr., saw Bell's Vireo in this county on June 1, and on June 23, Charles Keller found a young one just out of the nest. The only other 1946 record was of four birds seen by Clark on July 6 at Jasper-Pulaski State Game Preserve.

1947

Henry C. West observed a single individual in Marion County on April 19, near the junction of Fall Creek and White River (in Indianapolis) in some "2nd, 3rd, and 4th year saplings of . . . willow" (West, letter).

Dittrich reported it from Highland on May 31. On May 29, Clark, T. J. Nork, and Richard Zusi found a nest in a willow (*Salix* sp.) at the Jasper-Pulaski State Game Preserve. The nest contained two eggs and two young.

1948

Bell's Vireo was found in the same three counties where it was recorded the previous year. It was observed at three different localities in Marion County and Rice found a nest there containing one egg on June 14. West reported single birds on April 17 and 24, in Marion County. The third was a bird heard singing by Rice in a "scrub-grown abandoned pasture" (Rice, 1948:18) on June 7, probably a breeding bird. It was noted at Highland by Dittrich on May 16 and Clark observed two on the Jasper-Pulaski State Game Preserve on May 21.

1949

On April 21 and 25, Bell's Vireo was reported in Lake County by Dittrich. There were nesting records from Marion County that year "in two of the same places . . . where it was seen last year" (Wright, 1949:54). Nork and Zusi heard one singing at the Jasper-Pulaski State Game Preserve on June 26.

1950

I found a singing bird at Brazil, Clay County, Indiana, on May 22. I located the nest the following day. I heard another singing male one mile from this area during that summer. I also heard a singing male in Clinton, Vermillion County, on July 1.

Rice and Edward Mockford reported at least four birds at separate areas near Morocco, Newton County, in July. The first Tippecanoe County record was obtained on May 29, by Marvin Davis, Hubert Davis, and Richard Phillips. They found at least two males in the willow thickets surrounding some old gravel pits close to the Purdue University Campus, Lafayette.

Leonard Brecher informed me (in letter) that he had been shown a nest at the Jasper-Pulaski State Game Preserve in 1950, while on a hike with Nork and Clark. He further wrote, "We heard a number of singing birds in the area . . ." Upon inquiry I learned that this nest had been observed on June 26 by Clark, Nork, Zusi, Brecher, and others. It contained three eggs on that date.

Rice reported that Bell's Vireo nested in Marion County again in 1950. Dittrich reported a bird in Lake County on October 9. In view of the migration dates listed by Bent (1950:262), this appears to be a late record.

## 1951

I found two pairs and five nests in Brazil, Indiana, in 1951. In addition, I also discovered two old nests on an area where none was found in 1950.

Dr. C. M. Kirkpatrick heard a singing bird near Lafayette in the spring of 1951, and I located the nest on June 20. At another site close to the above nest, Kirkpatrick and I heard at least one, and perhaps two, other singing males and found one nest. Four males were subsequently heard and observed by Kirkpatrick, Dr. I. W. Burr, M. S. Webster, and me at still another site, near the Purdue University campus, in a nursery. A nest was just being started on July 5, but was never completed. Persistent searching in the summer months, as well as in November, after the leaves had fallen, failed to disclose any nests. On July 14, I did find an old nest (evidently built in 1950) in this nursery, but in an area where no Bell's Vireo was present in 1951.

Clark reported the birds again at the Jasper-Pulaski State Game Preserve on May 19, and on June 3, James B. Cope and I observed a singing male there. It was still present in the same area on July 7, although we did not search for the nest.

## 1952

Records for 1952 which have come to my attention are as follows: Cope heard two singing males at the Jasper-Pulaski State Game Preserve on May 24. I found four birds at two different areas near Lafayette on May 24; both of these areas were occupied in 1951. A new locality was added to the list on May 30, when Kirkpatrick, Phillips, and I found a singing male in a dense thicket of quaking aspen (*Populus tremuloides*) near Schererville, Lake County, Indiana. On June 30, I heard a singing male on the new Willow Slough State Game Preserve, near Morocco, Newton County. The following day I found three additional males singing at widely separated areas in Newton County. These are likewise new sites in Indiana for this species.

## HABITAT

In Indiana, Bell's Vireo seems to prefer areas with an abundance of low shrubs, thickets, briar tangles, and ground cover. Abandoned fields grown up to sassafras (*Sassafras albidum*), hawthorn (*Crataegus* spp.), wild plum (*Prunus* spp.), elder (*Sambucus canadensis*), and similar plants seem to be favored. In the strip-mining of coal in Clay County, many such areas are produced; it is on these sites that Bell's Vireo nests. A considerable portion of southwestern Indiana is characterized by this type of habitat, but no field work has been done in most of it.

Brushy fencerows, almost a thing of the past in intensively farmed areas, are also utilized. Some of the birds located in Tippecanoe County in 1951 were nesting in thick, shrubby fencerows composed mainly of hazelnut (*Corylus* sp.), poison ivy (*Rhus toxicodendron*), elder, shingle oak (*Quercus imbricaria*), and raspberry (*Rubus* sp.). Where such conditions exist in the northwestern portion of the state, Bell's Vireo may be present.

On poorly-drained areas which were once marsh land, cessation of farming allows the regrowth of quaking aspen, willows, and dogwoods (*Cornus* spp.). Bell's Vireo occurs in these situations on the Jasper-Pulaski and Willow

Slough State Game Preserves, the Morocco areas, Tippecanoe River State Park, and in Lake County. There is a large amount of such habitat in northern Indiana, notably along the Kankakee River.



FIG. 1. Nesting habitat of Bell's Vireo at Brazil, Clay County, Indiana. A nest was found in the small tree in the foreground on May 23, 1950. Photographed by Russell E. Mumford.

The nest tree is usually close to, or a part of, dense cover, such as wild plum thicket, dogwood clump, hazelnut clump, or briar patch. Nine nest trees averaged 11 feet in height. Most of these trees were situated in the open at the edge of a thicket (see Fig. 1). Where the nest was in a fencerow or row of nursery trees, it was placed on the border and not in the dense, central portion. The ground cover of the openings where nests were located usually consisted of goldenrod (*Solidago* spp.), aster (*Aster* sp.), milkweed (*Asclepias* spp.), and other open field plants. Such ground cover reaches a height sufficient to obscure the lower branches of the nest tree. The nest is placed where the ground cover merges with the low, drooping branches of the nest

tree. Thirteen nests found in Indiana in 1951 were in the following kinds of trees: hazelnut, 3; white elm (*Ulmus americana*), 2 (both in same tree; second nest built after first nest deserted); hawthorn, 2; apple (*Malus* sp.), 2; black cherry (*Prunus serotina*), 1; sugar maple (*Acer saccharum*), 1; willow, 1; and elder, 1. Two other nests thought to have been constructed in 1950 were found in hawthorns, apparently one of the favorite nesting sites.

#### NESTING

Nesting apparently begins in mid-May in Indiana. I saw two birds building a nest at Brazil on May 13, 1951. A nest containing three eggs on May 26, 1950, at Brazil, probably was started about a week earlier. Another nest in the same area was completed on May 31, 1951. Clark found a nest containing two eggs and two newly-hatched young on May 29, 1947, at the Jasper-Pulaski State Game Preserve. This nest probably was started about May 11 or 12.

Most observers agree that incubation requires about 14 days (Bent, 1950: 257). Nest building was determined to last from four to five days by Pitelka and Koestner (1942:99) in Illinois. The young are said, by these same authors, to remain in the nest about 11 days.

The nest is placed low in the tree. Thirteen nests in Indiana examined by me ranged from 20 inches to 40 inches in height. The average measured height of eight nests was 31 inches (Table 1). Every nest that I examined was placed in the fork of a small branch; in one case it was in a lateral fork instead of being in a terminal fork. The distance from the main stem of the nest tree to the nest varied from 9 to 43 inches; average, 24 inches. Additional nest data are presented in Table 1.

Typical nests were well-made and neatly-woven cups. All of the eight nests collected bore a marked resemblance to one another. The outside of the nest was often woven from the inner layers of milkweed stems, and other grayish materials. Occasionally, shreds of birch (*Betula*) bark, grapevine (*Vitis* sp.) stem, dead leaves, and bits of paper were utilized in the outer covering. The nests were always lined with the fine, reddish-brown stems of grasses. Each nest was bedecked with spider webs and cocoons, evenly distributed over the outside wall of the nest. Similar nest construction has been reported by Holland, Du Bois, Nice, and Simmons (*in* Bent, 1950:254-256).

#### BEHAVIOR AT THE NEST

On two occasions, I found both adults taking part in the construction of the nest. Pitelka and Koestner (1942:102) reported that the female built the nest unaided, in the five nests studied by them in Illinois. On May 13, 1951, I spent a short time observing a pair of birds at work on the nest at Brazil.

TABLE 1  
NESTS OF BELL'S VIREO IN INDIANA, 1943-1951

NEST No.	HEIGHT FROM BOTTOM OF NEST TO GROUND	INSIDE DIAM <sup>1</sup>	OUTSIDE DIAM. <sup>1</sup>	INSIDE DEPTH <sup>1</sup>	OUTSIDE DEPTH <sup>1</sup>	DISTANCE FROM TRUNK
1	about 20 in.					
2	about 36 in.					
3	23 in.	43 × 56	66 × 78	30	60	27 in.
4	40 in.	43 × 43	58 × 59	38	62	16 in.
5	22 in.	51 × 62	77 × 83	35	73	26 in.
6	36 in.	48 × 50	67 × 70	34	57	43 in.
7	28 in.	40 × 48	59 × 70	30	57	24 in.
8	28 in.	42 × 65	63 × 84	36	82	9 in.
9	about 30 in.					
10	40 in.	40 × 47	50 × 66	36	71	26 in.
11	30 in.					
12	about 36 in.					
13	"2¼ ft."					
Averages <sup>2</sup>	31 in.	44 × 53	63 × 73	34	66	24 in.

<sup>1</sup> Measurements in millimeters.

<sup>2</sup> Estimated heights not included in average.

The male was singing and I soon located him at the nest. He then left, returning in about a minute closely behind the female, which was carrying plant material. The female went directly to the nest, while the male flew into the nest tree and sang as the female worked on the nest. In a short time, the female flew from the nest, whereupon the male hopped down to it and appeared to be arranging the nesting material for several seconds. He then flew off low under the protection of an adjacent wild plum thicket in the direction taken by his mate. Soon both returned, the female with more nesting material, but the male with none that was visible. The same procedure was followed as before, except that this time the male sang as he was arranging the nest. Both birds left again. The female stayed away from the nest for the next few minutes, but the male returned four times and seemed to be adding something to it. This may have been spider silk, although it was not visible with a binocular from 60 feet away. On one of his visits, the male flew down to a leaning milkweed stem and unsuccessfully attempted to strip off some of the silky inner layers of the plant. Later, I saw both adults carrying nesting material from a point about 100 yards from the nest.

I hid near the above nest on May 21, 1951, to observe this pair. On this date the nest already contained two cowbird eggs and was hanging loosely

from its support. The male was singing near the nest at 9:30 a.m. At 9:35 a.m., a female cowbird alighted in the nest tree and was immediately chased away by the male vireo. As he flew after the cowbird, he gave a loud scolding note.

Both adults participated in incubation; on June 24, 1951, I flushed a male from Nest 4 (see below). He commenced singing after leaving the nest.

### SONG

The song of Bell's Vireo can hardly be considered a musical one, but it is distinctive and emphatic. Parts of it could be likened to that of the White-eyed Vireo (*Vireo griseus*), but the entire song is different. From a distance, the last and loudest portion of the song resembles that of the Alder Flycatcher (*Empidonax traillii*). This is only true when the rest of the song is inaudible. Males sing in the nest tree and this trait may possibly lead to destruction of the nest by the cowbird or other enemies. The typical song has been well-described by several authors, but Nolan has recorded in his notes a song that I have never heard. In speaking of this, he wrote, "They sang often, the regular gurgling song sometimes being replaced by a long, wild, squeaky performance which went on and on. It had no melody and was completely tuneless—it had the jerky, sputtering quality that characterizes part of the Ruby-crowned Kinglet's [*Regulus calendula*] song."

The existence of a territory is quickly perceived. As the observer approaches, the male begins to sing, often coming to meet the intruder. Males under observation sang at all hours of the day. One male at Lafayette sang once at 8:17 p.m. (Central Daylight Saving Time) on July 2, 1951, after I had "squeaked" a number of times to initiate singing. I found that squeaking often induced the male to sing, especially when the observer was near the nest site.

The song period in Indiana, from present records, ranged from April 24 (1948) to September 3 (1951). Singing rapidly diminished after August in Tippecanoe County, in 1951, however. On June 21, I timed a singing male for 15 minutes at Lafayette. This bird uttered his song from 9 to 17 times per minute; average, 13. During the last five minutes of this period, I was probably near the nest (though I did not locate it) and the bird increased his tempo so that he averaged 15 songs per minute. At 17 songs per minute, there is little pause between phrases and they pour out at a rapid rate. It is difficult to imagine how the bird could possibly sing more than 17 songs per minute. Apparently singing tempo decreases as the observer retires from the nest area, but quickly increases as he approaches.

NESTING SUCCESS

It is common knowledge that the Bell's Vireo is often parasitized by the cowbird. Cowbird interference was noted at seven of the 13 nests observed. In only one instance was a young cowbird raised. In most of the cases, the nest was deserted soon after cowbird eggs were laid.

Three young vireos disappeared from one nest when they were eight days old. This nest was not torn up or disturbed, possibly indicating that the predator was a snake. Keller observed a recently fledged vireo at Indianapolis, June 23, 1946, and I collected a fledgling at Lafayette on August 10, 1951. These are, to my knowledge, the only definite records of young birds being successfully produced in Indiana.

Data on six nests studied in 1950 and 1951 follow:

NEST 1 (1950)

- May 23 — 4:30 p.m. Female on nest.
- 26 — 8:30 a.m. Female on nest. Nest held four vireo eggs.
- June 2 — 7:45 a.m. Female on nest. Nest held three vireo eggs.
- 5 — Nest contained three vireo eggs.
- 7 — 9:45 a.m. Female on nest. Nest held one vireo egg and two very small young.
- 9 — Three young in nest.
- 15 — Nest empty but not torn up. Nest collected.

NEST 2 (1951)

- May 13 — 8:15 a.m. Both adults building nest.
- 19 — 9:00 a.m. Nest contained a cowbird egg. Lining of nest not completed. Nest hanging loosely from fork.
- 21 — 9:30 a.m. Nest still contained cowbird egg. Took nest and discovered a second cowbird egg almost buried in the bottom of the nest.

NEST 3 (1951)

- June 7 — New nest, in same tree as nest No. 2 above, completed except for lining.
- 8 — Nest empty.
- 9 — Nest empty.
- 12 — Female on nest; nest contained three vireo eggs.
- 14 — 4:40 p.m. An adult on nest. Nest held four vireo eggs.
- 15 — 6:25 p.m. Nest held one cowbird egg and no vireo eggs. No trace of vireo eggs on ground below nest.
- 17 — Cowbird eggs still in nest.
- July 3 — Collected deserted nest.

NEST 4 (1951)

- June 20 — 7:35 p.m. Male on nest. Nest held one vireo and one cowbird egg.
- 24 — Dr. I. W. Burr reported one vireo egg in nest.
- July 2 — Nest empty. No vireos near site. Collected nest.

NEST 5 (1951)

- May 28 — 3:20 p.m. Both adults building. Nest completed except for lining.
- 30 — Nest empty.
- June 2 — Nest appeared completed but empty.
- 4 — 3:15 p.m. Female on nest. Nest contained one vireo and two cowbird eggs.



- 6 — 10:40 a.m. Nest held two vireo eggs and two cowbird eggs. I removed cowbird eggs.  
7 — 4:10 p.m. Nest empty. One broken vireo egg on ground showed imprint of bird's beak.  
8 — Nest empty. Male vireo singing nearby.  
12 — Collected nest.

## NEST 6 (1951)

- July 3 — Nest located 50 yards from nest No. 5. A cowbird egg on ground below nest contained puncture as if made by beak of bird. Nest empty. No other data.

At nest No. 3, the cowbird apparently removed all four of the vireo eggs. Similar treatment was apparent at nest No. 5, from which two vireo eggs disappeared. On the other hand, at nests Nos. 4 and 6, I think it likely that the vireos removed the cowbird eggs.

## SUMMARY

Bell's Vireo has been recorded in eight Indiana counties from 1943 to 1952. The first specimen was taken August 10, 1951, near Lafayette, Tippecanoe County, Indiana.

In Indiana, Bell's Vireo prefers areas where shrubby growths border, or are contained in, abandoned fields. Ground cover at the nest site is usually dense. Hawthorn is one of the favorite nest trees.

Nesting apparently begins in mid-May in Indiana. The nest is placed low in the tree, at an average height of about 31 inches.

Both adults participated in nest building and, apparently, incubation.

Singing was heard from April 24 to September 3. Nolan reported a variation of the song which is apparently little known. Males sometimes sang at the rate of 17 times per minute; average for 15 minutes of one which was timed, 13.

Cowbird interference resulted in a low nesting success.

## ACKNOWLEDGMENTS

I wish to thank Dr. George M. Sutton for his comments and suggestions on the manuscript. I also wish to thank all of the persons who have graciously supplied me with their records and have given me permission to quote from their field notes.

## LITERATURE CITED

BENT, A. C.

1950 Life histories of North American wagtails, shrikes, vireos, and their allies. *U. S. Natl. Mus. Bull.* 197.

BUTLER, A. W.

1897 Birds of Indiana. *Indiana Dept. Geol. and Natl. Res. Ann. Rept.*, 22:1179.

PITELKA, F. A., AND KOESTNER, E. J.

1942 Breeding behavior of Bell's Vireo in Illinois. *Wilson Bull.*, 54:97-106.

RICE, D. W.

1948 Status of Bell's Vireo in Marion County [Indiana]. *Wildlife Newsletter*, 1(2):18. (Mimeographed.)

WRIGHT, H. F.

1948 Past and present status of four species in Indiana. *Yearbook Indiana Audubon Soc.*, 26:45-49.

1949 Fall and spring migration records. *Ibid.*, 27:54.

ROUTE 1, CORTLAND, INDIANA, JULY 3, 1952

#### NEW LIFE MEMBER



Alexander Wetmore, life member, has found birds his prime interest in life since his boyhood years in south-central Wisconsin. Educated at the University of Kansas and George Washington University, he was in the service of the old Biological Survey until 1924, and subsequently in the Smithsonian Institution. After 27 years as Assistant Secretary and Secretary of the Smithsonian, he is relinquishing heavy administrative duties at the end of 1952 to devote his entire time to research in ornithology. His principal contributions in several hundred papers have been in systematic classification, fossil birds, geographic distribution, and migration. His great pleasure is in active field work in tropical America. The photograph was taken in March, 1952, on the coast of western Panamá.