

**STATUS AND NATURAL HISTORY OF BIRDS OF
LOUISIANA.
I. VIREOS (VIREONIDAE)**

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The status of the birds of Louisiana as a whole has not been updated since Lowery (1974). We are working on a book that will not only document the status of Louisiana birds in detail but will also include data not presented by Lowery (1974) on habitat, identification, behavior, timing of migration, high counts, diet, band recoveries, body weight, bare part coloration, and subspecies status. To give field observers an idea of what sorts of data will be presented and what kinds of information are still needed, we plan to publish separately many family chapters. This is the first in the series. We have omitted here the sections on identification, most behavioral information, timing of breeding (except for Bell's Vireo, for which little if any additional data exist), and band recoveries (unknown at this point whether any exist for vireos in Louisiana). We solicit comments, additions, and corrections from those working on birds in Louisiana.

The sequence of families, genera, and species, as well as the English and scientific names, follows that of the A.O.U. Check-list (1998). For each species, we provide the following information (as well as occasional elaboration on other topics):

STATUS AND HABITAT: We described abundance using the following terms with respect to the *usual* number detected per 4-hr morning in suitable habitat (from our experience in Louisiana): *abundant* = more than 100; *common* = 25-99; *fairly common* = 6-24; *uncommon* = 2-5; *rare* = 0-1; *casual* = averages fewer than four records per year in all of Louisiana.

To describe seasonal status in Louisiana, we used the information in Oberholser (1938), Lowery (1974), records in *Audubon Field Notes/American Birds*, and our own experience in Louisiana. We use the following terms to describe seasonal status: *permanent resident* = found throughout the year; *migrant* = engaged in seasonal movement between breeding and winter ranges; *breeding* = breeds in Louisiana; *winter resident* = resides in Louisiana through winter months; *winter visitor* = occurs in Louisiana during winter months but does not seem to remain for extended periods; *spring* = anytime from late January to early June, depending on the migration period of the species in

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question; *fall* = anytime from late June to early December, depending on the migration period of the species in question; *early winter* and *late winter* = many species that occur in Louisiana in "winter" actually show pronounced differences in status in the first portion of winter, say late November to about first week of January, compared to the second portion of winter, from about the second week of January through early March. Therefore, we use *early winter* to identify the first portion, *late winter* the second portion, and *winter* for the entire period. Many species whose main population winters south of Louisiana occur in low numbers in early winter but are extremely scarce in late winter. David A. Wiedenfeld and Bill Vermillion provided data from the Louisiana Breeding Bird Atlas program to assess breeding distributions within the state.

We use the following terms with respect to Louisiana geography: (1) "northern Louisiana" = north of the southern boundaries of Sabine, Natchitoches, Winn, Caldwell, Franklin, and Tensas parishes; this corresponds fairly closely to the January mean minimum temperature isotherm of 35°F; "central Louisiana" = south of the same boundary (to include all of Vernon, Rapides, Grant, La Salle, Catahoula, and Concordia parishes) to the southern boundaries of Calcasieu, Jefferson Davis, Acadia, Lafayette, St. Martin, Iberville, Ascension, and Livingston parishes and all parishes north of Lake Pontchartrain; this corresponds fairly closely to the 40° F isotherm for January mean minimum temperature; and "southern Louisiana" = all parishes south of the above (which includes all parishes bordering the Gulf of Mexico as well as Assumption, St. James, St. John the Baptist, St. Charles, and Orleans). These boundaries are unavoidably arbitrary, the consequence of forcing typological categories on an obvious continuum of variation, and also result in the unfortunate inclusion in "central Louisiana" of many areas that are culturally and biologically in "south" Louisiana. We welcome suggestions for improving the current categories.

SIGNIFICANT RECORDS or RECORDS: We tabulated individual records for seasons or regions when or where a species' status is casual. These records were taken from Oberholser (1938), Lowery (1974), the regional reports and Christmas Bird Counts in *Bird-Lore/Audubon Field Notes/American Birds/National Audubon Society Field Notes*, the published reports of the Bird Records Committee of the Louisiana Ornithological Society, Cardiff's column in *L.O.S. News*, other published literature, R. D. Purrington's unpublished manuscript on the birds of southeastern Louisiana (cited as "Purrington MS"), unpublished records in the "American Birds" File (hereafter "ABF") housed at the Museum of Natural Science, Louisiana State University, and our own field notes. For species whose state-wide status is casual, we list all records that we consider valid in chronological order by year. For other species, we often list records that are (a) extremes in arrival or departure, (b) unusual for a

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particular region of the state, or (c) unusual for a particular season. In these cases, the records are listed in chronological order by date, regardless of year, unless the status has changed historically, in which case the records are listed chronologically by year. In the case of extreme dates, we have listed the three most-extreme dates that we can find, but we often provide more than three dates to give a more comprehensive representation, particularly regionally. Unfortunately, we have been unable to find three extreme dates for all regions of Louisiana in every case. We have also attempted to list the extreme records supported by archived tangible evidence, i.e., museum specimens, photographs, videotapes, or tape-recordings.

For each record, the number of individuals involved is "one" unless another number is provided in parentheses in front of the date. Genders of specimens are also provided in parentheses in front of the date; "u" refers to specimens that could not be sexed. Localities in parentheses refer to names given to sites by bird-watchers but not known by these names on topographic maps. Parish names are italicized but are not included for major cities or well-known localities. Observers are listed in order of their listing in *American Birds* or elsewhere, with the person credited with finding the bird listed first. For specimen records, the first person listed is also the one who collected the specimen unless "[coll.]" follows the name of someone else. Literature citations are provided for published records. Records published in *Audubon Field Notes/ American Birds* followed by the notation "ABF" have supplemental information from the ABF, such as specific locality or more precise dates, that were not published. If there is an error in the published records in *American Birds* with respect to dates, observers, locality, etc., that conflicts with what we present, then the reference is marked with a superscript "°". Records from Christmas Bird Counts are identified by "CBC," and those from the U.S. Fish & Wildlife Service's Breeding Bird Survey program are identified by "BBS"; precise localities within the count areas for these records are often omitted because they are not known. Previously unpublished records taken from the ABF are indicated by "ABF" after the observer name or initials. If a citation other than an observer's name or initials is not provided for a record, then it is a previously unpublished record from that observer's personal field notes. Museum catalog numbers are given for those records supported by specimens. Museum abbreviations are as follows: LSUMZ (Museum of Natural Science, Louisiana State University), and USNM (National Museum of Natural History, Smithsonian). Reports in *American Birds* often indicate that photographs were taken, but if these were never published, deposited in a reference collection, or deposited in the ABF, we do not consider the record to have been documented by a photograph.

DIET: Only observations from Louisiana are included. When available, we provide summaries of our own field observations on foods taken or data from the LSUMZ Stomach Contents Collection.

TIMING OF MIGRATION: The only published quantitative data that exist for Louisiana for vireos are those of Remsen et al. (1996), which compared surveys from a coastal area (*Cameron*) to those from an inland area (near St. Gabriel, *Iberville*). Lacking data from elsewhere, however, we cannot be certain that the differences found between the areas might also be differences between western and eastern Louisiana. Unfortunately, the small sample sizes of specimens available for most species greatly limit analyses of differences in timing between age and sex classes.

BAND RECOVERIES: For each species, we obtain data from the Bird-Banding Laboratory, U.S. Fish & Wildlife Service, for individual birds banded in Louisiana and recaptured away from their banding sites or birds banded outside Louisiana recaptured in Louisiana. For vireos, there are currently no records of either kind (K. Klimkiewicz, pers. comm.).

HIGH COUNTS: To provide information on maximum numbers that can be found in a day, we list the highest single-day totals known to us within each season of occurrence of a species. These include only totals found by a single group of observers, not the composite totals of several groups, such as reported on Christmas Bird Counts (although totals from single parties on a Christmas Count are eligible). For species with seasonal movements, such high counts may identify periods of peak movements. For permanent resident species, such counts give some indication of their abundance in Louisiana. However, we recognize that much higher totals could be obtained for virtually every species if an observer dedicated the entire day to finding *only* that species. We have not included more than two high counts from the same area. High counts from the U.S. Fish and Wildlife Service's BBS program, other than Remsen's, were provided by David A. Wiedenfeld and Bruce Peterjohn.

Ideally, such "high count" figures would represent density number of individuals/unit area). Such data, however, are mostly unavailable. Although the figures that we report reflect abundance, they have no density component. In fact, the "high count" figures depend often on how much territory was covered during the day and the skill of the observers, especially in voice identification. Unfortunately, they also are influenced by the abilities of the observers to estimate numbers and the tendency by many observers to exaggerate numbers, particularly of highly vocal, active species. It is only human nature to want to "credit" oneself with each vocal or visual detection, regardless of the

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likelihood of duplication of individuals. We suspect that some birders have an unfortunate tendency towards "one-upsmanship" with respect to reporting large numbers of birds. We have excluded certain high counts from our compilations because we suspect that one or more of the above-mentioned factors produced exaggerated numbers.

In a few cases, truly phenomenal counts may misrepresent the numbers that might be expected during that time period. For example, on 29 August 1986 Al and Gwen Smalley encountered a truly spectacular, perhaps once-in-a-lifetime, "fall-out" of fall migrants that produced several all-time high counts of migrants that rival or exceed those from spring migration.

BARE PARTS: Although the colors of bird feathers remain largely unchanged from life in recently collected specimens, the colors of the "bare parts" are unavailable (iris) or experience varying degrees of post-mortem change (iris, bill, facial skin, tarsus, toes). Color descriptions of these bare parts recorded on specimen labels upon the death of the bird thus provide a reservoir of data on bird coloration otherwise difficult to obtain. We provide such data from LSUMZ specimens collected in Louisiana. Ideally, such data would come from live individuals, with comparisons to color standards under similar light by the same person. In reality, the bare part colors are noted by a variety of preparators with differing color interpretations and degrees of experience and attention to detail, and under heterogeneous lighting conditions. The vast majority of bare part colors on LSUMZ specimens are recorded as soon as possible after death and before freezing. Nevertheless, we suspect that much of the heterogeneity in the descriptions is an artifact rather than individual variation in the birds themselves. Therefore, we have not quantified the variability, particularly because this also depends on how many specimens of each species were prepared by particular people. However, we list color descriptions in order of frequency of use. We did scan our compilations of bare part colors for each species to see whether consistent, obvious patterns existed in gender, age, or seasonal differences. None were found for vireos, except in some young White-eyed Vireos.

One reason why we present bare part colors is that these are often inaccurately displayed in field guides. For example, artists usually add depth to the appearance of the maxilla by giving it some sheen along the culmen, thereby making it difficult to be certain that the maxilla is uniformly colored, such as in vireos, for example, in which all species discussed herein have a uniformly dark maxilla. The reduction in size of field guide portraits from the original paintings also tends to make the iris color look black rather than the typical dark brown or brown in many vireos. Because it is difficult in the field to see that the iris is not black, field guide portraits probably more accurately portray the color

discernible under most field conditions. Nevertheless, knowing true iris color is important. Finally, field guide illustrations of tarsus and toe color of vireos tend to under-represent their blue tones. At least one reference (Phillips 1991) portrays erroneous tarsus color for vireos.

SUBSPECIES: We summarize current understanding of subspecies taxonomy for Louisiana populations. For subspecies that have occurred only a few times, details of records are given.

UNSUBSTANTIATED, DUBIOUS, OR ERRONEOUS RECORDS
We list published records that we do not believe are valid or for which substantiating details are unavailable. For the vast majority of records in this category, absence of written details is the reason for their inclusion in this category; we encourage the observers to provide us with such details if available for records in this category. We do not include records rejected by the Bird Records Committee of the Louisiana Ornithological Society unless the original record was previously published as valid. We usually do not include suspicious records published only in local newsletters without supporting details.

BODY WEIGHTS: Body weight is a good indicator of overall size differences, particularly for those species that differ in proportions so that linear measurements might be misleading. In the Appendix, we present weights (body mass) of specimens in grams. Only data from specimens from Louisiana are provided unless stated otherwise. For age/sex/fat categories for which there are 6 or more individuals, mean, range, and sample size ("N") is provided. If there are 5 or fewer individuals in a category, all individual weights are listed. Some preparators round body weights to the nearest whole gram, whereas others weigh to the nearest 0.1 gram; therefore, a mass of "11" indicates a rounded value, whereas "11.0" indicates the latter. Because fat deposits influence body mass strongly, we compiled specimens in three categories: (1) "no," "trace," or "light" fat; (2) "moderate" or "heavy" fat; and (3) "very heavy" or "extremely heavy" fat. Users of body weight data must keep in mind that differences among scales used to weigh the various specimens as well as individual differences in assessing fat levels create heterogeneity in the data. Because our data come from a single institution, such problems are reduced but still evident, as inspection of our tables will show.

Dunning's (1993) compilation of body mass data for birds of the world was intended to provide the "best" data sets available for each species. For several of the vireo species treated in this paper, the "best" data sets found by Dunning were from bird-banding studies that were unable to determine the gender of the individuals weighed. Also, no account was made for differences in subcutane-

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ous fat levels that influence body mass drastically, as reflected in the huge range in body masses reported. Although Odum's (1993) laboratory-generated data that compare "dry mass" are obviously the best comparative data for these vireos and other species, they cannot be compared to typical body-mass data. Therefore, some of our specimen data might provide the best comparative data because differences in age, sex, and fat levels can be factored out.

White-eyed Vireo *Vireo griseus*

STATUS AND HABITAT: Common breeding species state-wide, except rare in coastal cheniers. Common migrant state-wide. In winter, rare to casual in northern Louisiana, rare in central Louisiana, and rare to uncommon in southern Louisiana. In coastal cheniers and probably elsewhere, much less common in late-winter than in early winter (Remsen et al. 1996). Found primarily in deciduous forest edge, near tree-fall gaps in deciduous forest interior, and in dense second-growth. In winter, more restricted to areas with dense undergrowth. The highest densities of breeding-season White-eyed Vireos in the United States have been found in Louisiana (Hopp et al. 1995).

SIGNIFICANT RECORDS:

early spring migrants in central Louisiana (assuming tower-killed individuals represent true migrants):

- (♂, ♀, u) 15 Mar. 1964, Baton Rouge (S. A. Gauthreaux; tower-kills LSUMZ [skeletons] 48893-94, 51377)
- (♂) 19 Mar. 1973, Baton Rouge (R. Louque; tower-kill LSUMZ [skeleton] 73174)

early spring migrants in northern Louisiana:

- 13 Mar. 1955, near Shreveport (H. H. Jeter; Newman 1955)
- 14 Mar. 1972, Natchitoches (R. B. Hamilton; ABF)
- (4) 25 Mar. 1995, Cross Lake, *Caddo* (C. E. Lyon)
- (4) 30 Mar. 1991, Coopiona area, *Caddo* (C. E. Lyon)
- (2) 30 Mar. 1992, Walter Jacobs Park, *Caddo* (C. E. Lyon)
- 30 Mar. 1994, Cross Lake, *Caddo* (C. E. Lyon)
- (3) 30 Mar. 1994, Ford Park, Shreveport (R. Seidler, L. Cunningham; ABF)

early winter in northern Louisiana:

- 18 Dec. 1983, north shore Cross Lake (H. H. Jeter et al.; Shreveport-BC CBC; Myers and Muth 1984; ABF)
- 18 Dec. 1993 (D'Arbonne CBC)
- 20 Dec. 1969 (R. B. Hamilton; Natchitoches CBC)
- 20 Dec. 1970, Natchitoches (R. B. Hamilton; ABF)
- 21 Dec. 1957 - 5 Jan. 1958, 2 mi. W of Longwood, near Shreveport (J. R. Stewart, R. Lance; Shreveport CBC, Newman 1958a)
- (♂) 23 Dec. 1940, 9 mi. N Monroe (G. H. Lowery, Jr.; LSUMZ 4597)

- 26 Dec. 1981 (R. & S. Lance; Shreveport CBC)
- 28 Dec. 1991 (Bossier-C-B CBC)
- 30 Dec. 1987 (Tensas River NWR CBC)
- 30 Dec. 1992 (Tensas River NWR CBC)
- 2 Jan. 1971, Natchitoches (R. B. Hamilton; ABF)
- 5 Jan. 1997 (Bossier-Carbo-Bienville CBC)

VOCAL MIMICRY: Forbush (1929) and Oberholser (1938) reported long ago that the White-eyed Vireo imitates call notes of other bird species. This prominent aspect of its song was documented and quantified by Adkisson and Connor (1978), who found that 95 of 100 song-types recorded in Virginia contained identifiable imitations of other bird species' vocalizations. McNair and Forster (1983) also reported imitations of other bird vocalizations in the songs of 30 individuals from southern New England and the southern United States. Nevertheless, few field ornithologists are evidently aware of this. In fact, Borror (1977), in a major analysis of the song of White-eyed Vireo from throughout its range, evidently did not realize that this species copies other bird vocalizations and that much of the geographic variation in song could be the result of different species available for copying. Of the widely used field guides or bird books that we have searched, only a few (e.g., Imhof 1976a) mention this aspect of White-eyed Vireo song, and we can find no mention of it in the general literature other than some quotes from Forbush (1929) in Bent (1950). Because the White-eyed Vireo imitates the calls of many common Louisiana birds, these imitations provide a potential source of error for censusing, particularly for the 3-min count intervals used in the U.S. Fish and Wildlife Service's Breeding Bird Survey.

The legendary variability of White-eyed Vireo song, mentioned by virtually all authors who describe it (e.g., Lowery 1931), is due in part to the variety of species imitated. Most songs, however, share a sharp introductory note, followed by 2-3 more melodious syllables, and a sharp terminal note. In Louisiana, the sharp notes are often copied calls of Downy Woodpecker (*Picoides pubescens*), Acadian Flycatcher (*Empidonax virescens*), Hooded (*Wilsonia citrina*), Prothonotary (*Protonotaria citrea*), and Kentucky Warbler (*Oporornis formosus*), and occasionally of Eastern Wood Pewee (*Contopus virens*; the soft "plick" call). The middle syllable and last notes are frequently Summer Tanager (*Piranga rubra*) ("pi-ti-tuck" call), Wood Thrush (*Hylocichla mustelina*) ("pap-pap-pap"), Blue Jay (*Cyanocitta cristata*), Great Crested Flycatcher (*Myiarchus crinitus*), and Red-eyed Vireo (nasal "nyah"). In Louisiana as elsewhere, the most frequently incorporated models are species (a) that have brief but distinctive calls, and (b) that vocalize frequently in the vicinity. Other species whose calls Remsen has noted in White-eyed Vireo songs in Louisiana are: N. Flicker (*Colaptes auratus*), American Robin (*Turdus*

migratorius), Veery (*Catharus fuscescens*), Blue-gray Gnatcatcher (*Poliophtila caerulea*), Gray Catbird (*Dumetella carolinensis*), Brown Thrasher (*Toxostoma rufum*), Song Sparrow (*Melospiza melodia*), N. Cardinal (*Cardinalis cardinalis*), N. Waterthrush (*Seiurus noveboracensis*), Common Yellowthroat (*Geothlypis trichas*), Yellow-breasted Chat (*Icteria virens*; nasal "yowmp!"), and House Sparrow (*Passer domesticus*).

DIET: Primarily arthropods, but in fall some fruit is occasionally consumed (e.g., Spicebush, *Lindera benzoin*). LSUMZ stomach contents: arthropods only (N = 47, including 2 with caterpillars); arthropods (1 caterpillar) and fruit (N = 3). Only 1 stomach content sample is from winter; it is one of the two with fruit; perhaps additional samples from winter would show a higher proportion of fruit in diet (as is known elsewhere in range; Hopp et al. 1995); individuals wintering in Mexico rely heavily on fruit (Greenberg et al. 1993, 1995).

TIMING OF MIGRATION: The first influx of migrants in spring is usually in mid-March (Remsen et al. 1996); TV-tower kills of fat individuals unambiguously migrating have been recorded in Baton Rouge as early as 15 and 19 March. In coastal *Cameron*, spring migrants are detected through at least the first week of May, and fall migrants are detected from mid-September through late October, with the peak at around 10-15 October (Remsen et al. 1996). Inland, near St. Gabriel, no spring migration is detectable; in fall, numbers begin to increase over breeding populations in mid-August, and highest numbers occur in the first three weeks of September, declining sharply thereafter through late October. Therefore, fall migration occurs substantially earlier inland than on the coast (Remsen et al. 1996).

HIGH COUNTS:

SPRING MIGRATION: **150-200** (exceptional), 11 Apr. 1978, Grand Isle (M. Myers, N. Nelkin, J. Reinoehl; ABF); **60**, 3 Apr. 1980, Grand Isle (S. W. Cardiff); **40**, 11 Apr. 1990, *Cameron* (A. W. Kratter, J. Sterling).

BREEDING: **144**, 23 May 1994, Atchafalaya River, *St. Martin & Pointe Coupee* (A. W. Kratter, J. V. Remsen); **107**, 16 June 1992, Atchafalaya River BBS, *St. Martin & Pointe Coupee* (J. V. Remsen, D. A. Wiedenfeld); **80**, 17 June 1987, Plettenberg BBS, W. Feliciana (P. McKenzie).

FALL MIGRATION: **18**, 29 Sep. 1985, Grand Isle (R. D. Purrington, N. Nelkin; ABF); **15**, 15 Oct. 1983, *Cameron* (J. V. Remsen, C. L. Cummins, C. Massey, G. H. Rosenberg, T. S. Schulenberg; Remsen et al. 1996); **15**, 18 Sept. 1994, Soda Lakes area, Shreveport (R. Seidler); **12**, 9 Sep. 1990, on ca. 4 acres, 3.7 mi. N St. Gabriel, *Iberville* (J. V. Remsen; Remsen et al. 1996).

WINTER: **12**, 25 Feb. 1996, *Jefferson* (P. Yaukey); **10**, 12 Feb. 1996, *St. Charles* (P. Yaukey); **9**, 8 Feb. 1987, Baratavia Unit, J. Lafitte Nat. Hist. Park (J. P. Kleiman, M. M. Swan, P. McKenzie, R. J. Stein; ABF).

BARE PARTS: (N = 33). Iris = dull white, whitish, grayish-white, gray,

off white, white, or pearl white; of the six immatures with iris color noted, all from September or October, one is brown and five are whitish. Maxilla = black, dull black, usually with pale tomium. Mandible (variable; often with pale tomium) = leaden blue, gray, dark bluish-gray, dark gray, blue-gray; grayish horn, or silver, also sometimes (N = 5) bicolored, e.g., distal half gray, proximal half black. Tarsi and toes = bluish-gray, leaden blue, light gray, pale gray, gray, dark gray, blackish gray, slate gray (variability due to differences in fresh vs. frozen specimens?).

BODY MASS: Our data (Appendix 1) show that individuals may be able to increase their mass by more than 100% by addition of subcutaneous fat. Dunning's (1993) mean mass of 11.4 g is very close to our means for individuals with "no" or "light" fat.

SUBSPECIES: Burleigh and Lowery (1945) determined that the subspecies that breeds in most of Louisiana is the widespread subspecies of eastern North America, *V. g. noveboracensis*, and that *V. g. griseus* breeds along the immediate coast and in the New Orleans area (type locality restricted to "New Orleans"). This treatment was followed by the A.O.U. (1957) and Blake (1968). Phillips (1991), however, questioned whether *noveboracensis* was valid, but gave no reasons.

We compared 20 recent specimens of known or presumed breeding birds (based on gonad data) from the range of *noveboracensis* (central and northern Louisiana, mainly *St. Martin* and *E. Baton Rouge*) to 28 older specimens identified by Burleigh and Lowery (1945) as nominate *griseus* from southeast Louisiana (N = 8) and coastal Mississippi (N = 20). The recent series of *noveboracensis* was indistinguishable from an older series of 10 *noveboracensis* taken in the Baton Rouge area during late March-early April of 1939-42 (N = 8) and 1963 (N = 2). Thus, because it appears that there are no appreciable plumage color differences in old vs. recent specimens of the same subspecies, we tentatively agree with Burleigh and Lowery (1945) that the interior series averages yellower-flanked, greener-backed, and more extensively and brighter yellow in the lores-forehead region than the duller coastal series.

Unfortunately, we believe that the status of nominate *griseus* vs. *noveboracensis* cannot be fully resolved, for the following reasons: 1) The "griseus" specimens used in Burleigh and Lowery's (1945) original analysis lack gonad, body mass, and fat data that would be helpful in determining whether they were truly local breeders rather than migrants. 2) Burleigh and Lowery's series of "griseus" from southeast Louisiana and coastal Mississippi was a mixture of specimens taken in August (N = 2), September (N = 3), October (N = 3), December (N = 1), February (N = 4), March (N = 1), April (N = 10), and May (N = 4), but did not include any specimens taken between 6 May-25 August. Thus, none of their supposed specimens from the coastal breeding

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population can be excluded as non-breeders. 3) Curiously, there are only 3 specimens (18 Apr., 3 and 8 Sep.), identified as *noveboracensis* in the LSUMNS series from coastal Mississippi and only 2 (17 Mar. and 27 Oct.) in the series from New Orleans; presumably, that subspecies should be a common migrant through those areas. 4) A small (N = 5) series of recently collected presumed breeders (mid-May through June) from the immediate coast of *Cameron* (presumably within the range of *griseus*) is indistinguishable from the series of interior *noveboracensis*. Only one of the *Cameron* birds exhibited definite signs of breeding activity (female with enlarged but regressing ovary and oviduct, and 4 regressing follicles), so we cannot exclude the possibility that some or all were late migrants or early post-breeders from elsewhere in the range of *noveboracensis*. Nonetheless, this potential inconsistency needs to be addressed. In light of these apparent obstacles to a sound analysis, we believe that recognition of *V. g. noveboracensis* is premature and that a final resolution of the status and distribution of White-eyed Vireo subspecies on the central Gulf Coast must await new specimen series of breeding birds from throughout southern Louisiana.

There is one record from Louisiana of *V. g. micrus*, a subspecies found primarily in northeastern Mexico and previously known only as far north as southern Texas (Blake 1968, Phillips 1991): collected by Robb T. Brumfield on 5 Nov. 1989 at East Jetty Woods, 2 mi. S Cameron (LSUMZ 152123; adult female). See Remsen et al. (1996) for details; this record also fits the dispersal pattern shown by several species from southern Texas or northern Mexico, namely a northeastward movement into Louisiana in late fall and winter (Cardiff and Remsen 1979; also see Bell's Vireo below).

Bell's Vireo *Vireo bellii*

STATUS AND HABITAT: Casual breeding resident in northwestern Louisiana in willow thickets. In 1950's, found nesting at several sites near Shreveport (Robson; Red River near Curtis; Gilliam; Bossier City; Dixie Gardens), but apparently no records there since then; in 1980's, a few pairs nested at Monroe. No documented records of spring migrants. Casual in fall and winter in scrubby chenier woods along coast of Cameron Parish, New Orleans area, and lower Mississippi River delta; few records elsewhere. Louisiana has an exceptional proportion of the few valid winter records of this species in North America (Remsen et al. 1996).

SIGNIFICANT RECORDS:

recent breeding areas:

- (3-4 pairs), Selman Field, Monroe, summer 1983, 1984, and 1985 (D. T. Kee et al.; Jackson 1983, 1984; Imhof 1985); 1 bird there 13 June 1986 (D.

T. Kee; Jackson 1986); 2 birds, 1 carrying food, 20 & 27 May 1987 (D. T. Kee; Imhof 1987)

- (pair), 2-16 June 1996, ca. 1 mi. W Marsalis, *Claiborne* (C. Lyon, H. J. Jeter, J. P. Kleiman, M. Guidry, K. Fay; taped; Cardiff 1997a; Dittmann and Kleiman 1998)

fall migrants:

- 26 Aug. 1990, Lacassine Bayou, ca. 1.5 mi. NE Hayes, *Jefferson Davis* (K. V. Rosenberg; Jackson 1991)
- 7 Sep. 1991, 3.7 mi. N St. Gabriel (J. V. Remsen; Cardiff 1992, Jackson 1992, Dittmann and Kleiman 1998; ABF)
- (im. ♀) 9 Sep. 1989, ca. 5 mi. E Cameron (S. W. Cardiff; Purrington 1990a; LSUMZ 152124)
- 15 Sep. 1986, *Cameron* (S. W. Cardiff, D. L. Dittmann, J. Holmes, Jr.; Purrington 1987)
- 24 Sep. 1987, New Orleans (N. Nelkin; Purrington 1988)
- 26 Sep. 1987, "Peveto Beach Woods," *Cameron* (M. M. Swan, D. Hunter; Purrington 1988; ABF)

early winter records:

- (ad. ♂) 4 Nov. 1984, Willow Island, 7 mi. E Cameron (T. S. Schulenberg, D. Hunter, G. H. Rosenberg; Purrington 1985; LSUMZ 121881)
- 15 Nov. 1969, Laplace, *St. John* (R. J. Stein; Purrington 1970)
- 15 Dec. 1990, "East Jetty Woods," *Cameron* (J. V. Remsen, G. H. Rosenberg, A. W. Kratter; Sabine NWR CBC, Stedman 1991)
- 19 Dec. 1997, N Kaplan, *Vermilion* (Gary Broussard, Sam Broussard; Crowley CBC)
- 21 Dec. 1997, Johnsons Bayou (Mark Swan; Johnsons Bayou CBC; videotape)
- 21 Dec. 1997 Johnsons Bayou School (Paul Sunby; Johnsons Bayou CBC)
- 24 Dec. 1983 (J. B. Ortego; Creole CBC)
- 27 Dec. 1987 - 10 Jan. 1988 (D. B. Crider, J. Sevenair, G. Ousset, D. P. Muth, R. D. Purrington, M. Myers; New Orleans CBC, Muth 1988; ABF)
- 29 Dec. 1952, 5 mi. W Holly Beach (G. H. Lowery, Jr.; Lowery and Newman 1953, Lowery 1974; LSUMZ 72 [mount])
- 30 Dec. 1972, *Cameron* (R. J. Stein; Sabine NWR CBC; Lowery 1974)
- 30 Dec. 1981 (S. A. Gauthreaux, N. Nelkin, N. L. Newfield; Venice CBC, Ortego 1982, Purrington MS)
- 5 Jan. 1997. *Plaquemines* (D. P. Muth, K. V. Rosenberg, R. Seidler; Venice CBC, Stedman 1997)

late winter records:

- 13 Jan. 1974, Willow Is., *Cameron* (R. J. Newman, M. Newman, H. D. Pratt; Hamilton 1974)

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- (u) 17 Jan. 1959, Reserve (M. Weber, R. F. Cambre; Newman 1959b, Lowery 1974; LSUMZ 22632)
- 3-27 Jan. 1993, Venice (K. V. Rosenberg, J. Arp, M. Weber, P. Wallace, R. Seidler, A. E. Smalley, C. Kersting; Venice CBC, Stedman 1993, Dittmann and Kleiman 1998; ABF)
- 25 Feb. - 10 Mar. 1995, 1 mi. S Indian Bayou, *Vermilion* (P. Conover [video-taped], D. Patton, S. W. Cardiff [coll.], D. L. Dittmann; Cardiff 1995b, c, Stedman 1995; LSUMZ 161214)
- 9 Mar. 1986, Reserve (R. J. Stein; Imhof 1986)

TIMING OF BREEDING: Egg dates: 10 May 1959 (H. H. Jeter; ABF); 13 May 1951, Shreveport (H. H. Jeter; Lowery and Newman 1951b); 13 May 1951, between Bossier City and Barksdale Field (H. H. Jeter; Lowery and Newman 1951c).

DIET: The stomach contents of four specimens from Louisiana contained "insects" and "insects, small green caterpillars, 4 black fruit 4-5 mm diameter." The individual seen on 15 Dec. 1990 near Cameron was observed to mouth Chinese Tallow-Tree (*Sapium sebiferum*) fruits. Known elsewhere to be primarily insectivorous, at least during breeding season (Brown 1993).

TIMING OF MIGRATION: There are virtually no convincing records of spring transients. Breeding birds arrive on their Louisiana breeding territories at least as early as 28 Apr., probably earlier (H. H. Jeter; Lowery and Newman 1951b, ABF); they remain at their Louisiana breeding sites as late as 11 Sep. (J. R. Stewart; ABF). The Louisiana records away from the breeding grounds from late August to late September presumably represent south-bound fall migrants. No records exist from then until early November. We suspect that the records from November through winter represent a separate influx, possibly individuals that have been forced southward after attempting to winter farther north or that have straggled northeastward along the Gulf Coast from the Mexican winter range. The latter pattern is shown by many species with obvious Mexican origins (Cardiff and Remsen 1979), e.g., Buff-bellied Hummingbird (*Amazilia yucatanensis*), Groove-billed Ani (*Crotophaga sulcirostris*), Brown-crested Flycatcher (*Myiarchus tyrannulus*), and Vermilion Flycatcher (*Pyrocephalus rubinus*). Thus, we wonder whether individuals of other species that usually appear along the Gulf Coast long after their normal migration schedule at comparable latitudes also originate from Mexico rather than from farther north or west, e.g., all "western" hummingbirds, Ash-throated Flycatcher (*Myiarchus cinerascens*), and Black-headed Grosbeak (*Pheucticus melanocephalus*).

BARE PARTS: The two fall Louisiana specimens with bare-parts data, both immatures, were described as follows (male first): iris brown and dark brown; maxilla gray-brown and grayish-horn-brown; mandible pinkish-white and pale pinkish flesh; tarsi and toes bluish-gray and leaden blue. The female

from March had a dark brown iris, blackish-horn maxilla, pale grayish-flesh mandible, and leaden-blue tarsi and toes.

SUBSPECIES: The breeding population is presumably *V. b. bellii*, the form that breeds in the Great Plains and the Midwest (Blake 1968), but no specimens have been collected. The Sept. specimen is *V. b. bellii*. The January specimen is *V. b. medius* (Remsen et al. 1996), a subspecies that breeds in New Mexico and southwestern Texas south to north-central and northeastern Mexico (A.O.U. 1957, Blake 1968); the March specimen from Vermilion Parish is also *medius*.

UNSUBSTANTIATED, DUBIOUS, OR ERRONEOUS RECORDS: 31 Mar. 1930, Monroe (Lowery 1931); 23 June 1933, Houma (in Oberholser 1938); 24 Apr. 1933, Baton Rouge (in Oberholser 1938; that record not included by Lowery [1974] in his records from Baton Rouge area); (1-2) 9-10 Apr. 1955, Cameron (in Newman 1955c); 24 Apr. 1955, Cameron (in Newman 1955c); (4) 3 Apr. 1971, Hackberry (in Imhof 1971); (1-2) 25 Apr. - 9 May 1970, Johnsons Bayou (in Imhof 1970); 16 May 1972, Cameron (in Imhof 1972); 18 Mar. (no year, locality, or observer; in Lowery 1974); 1 Mar. 1979, Cameron (in Hamilton 1979); 17 Jan. 1975, Willow Is., Cameron (in Hamilton 1975); 17 Dec. 1989, Orleans (in Jackson 1990).

Blue-headed Vireo *Vireo solitarius*

STATUS AND HABITAT: Uncommon winter resident in southern and central Louisiana, rare in northern Louisiana, possibly only casual there after early winter. Found primarily in broadleaf forest, but also in chenier woods, tall second-growth, and well-wooded suburbs. Late winter birds seem to be found mainly in areas with live oaks, tall pines, or other evergreen trees (but quantitative data lacking).

SIGNIFICANT RECORDS:

late spring in southern Louisiana:

- (♂) 29 Apr. 1989, ca. 5 mi. E Cameron (P. McKenzie, J. V. Remsen [coll.], D. Magee; LSUMZ 138311)
- 29 Apr. 1997, Cameron (S. W. Cardiff; Cardiff 1997b)
- 2 May 1985, New Orleans (N. Nelkin; Purrington MS)
- (3) 3 May 1957, Cameron (J. P. Gee; Newman 1957b)
- 11 May 1989, "Peveto Beach Woods," Cameron (D. Patton [photo]. C. Butterworth, T. A. Parker, G. Budney; Imhof 1989, Dittmann 1995; photo checked by S. W. Cardiff)

late spring in central Louisiana:

- 15 Apr. 1994, 3.7 mi. N St. Gabriel, Iberville (J. V. Remsen; Remsen et al. 1996)
- 18 Apr. 1993, 3.7 mi. N St. Gabriel, Iberville (J. V. Remsen; Remsen et al. 1996)

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late spring in northern Louisiana:

- 3 May 1995, Shreveport (R. Seidler; ABF)
- 5 May 1951, Cross Lake, *Caddo* (H. H. Jeter; Lowery and Newman 1951b, ABF)
- 5 May 1987, Haynesville, *Claiborne* (C. E. Lyon)
- 8 May 1992, Ford Park, Shreveport (R. Seidler; ABF)
- 9 May 1981, Shreveport (H. H. Jeter, C. Lyon; ABF)

early fall in northern Louisiana:

- 18 Sep. 1994, Soda Lake WMA, NW of Shreveport (R. Seidler)
- 20 Sep. 1970, Natchitoches (R. B. Hamilton; ABF)

early fall in central Louisiana:

- 5 Oct. 1950, Baton Rouge (M. Moore; Lowery and Newman 1951a)

early fall in southern Louisiana:

- 4 Sep. 1994, Cameron (G. Broussard, P. Conover [videotaped]; Cardiff 1995a, Jackson 1995)
- 12 Sep. 1959, 4 mi. SE Cameron (J. P. Gee; ABF)
- 13 Sep. 1953, 4 mi. SE Cameron (J. P. Gee, M. B. Eyster; ABF)
- (im. ♂) 20 Sep. 1987, Garner Ridge, 3 mi. W Johnsons Bayou School, *Cameron* (D. L. Dittmann, S. W. Cardiff [coll.]; Purrington 1988; LSUMZ 135161)
- (im. ♂) 29 Sep. 1990, 5 mi. E Cameron (S. W. Cardiff; LSUMZ 157045)
- 3 Oct. 1987, "E. Jetty Woods," ca. 2 mi. S Cameron (S. W. Cardiff; ABF)
- (♂) 4 Oct. 1988, Willow Island, ca. 7 mi. E Cameron (S. W. Cardiff; Purrington 1989; LSUMZ 138312)

WINTER SOCIAL SYSTEM: Although a characteristic member of mixed-species flocks in its tropical winter range (references in Bent 1950; Stiles and Skutch 1989), we can find few clear statements to this effect for North American wintering populations. In fact, Imhof (1976a) stated that in Alabama it "rarely joins the loose bands of titmice and other small insect-eaters." In contrast, Stevenson and Anderson (1994) reported that in Florida that "1 or 2 individuals often associate with winter flocks " of small insectivores. This matches our experience in Louisiana, where in winter, this species is almost always found in mixed-species flocks with Carolina Chickadee (*Poecile carolinensis*), Tufted Titmouse (*Baeolophus bicolor*), Blue-gray Gnatcatcher (*Polioptila caerulea*), Pine Warbler (*Dendroica pinus*), kinglets (*Regulus* spp.), and other small insectivores; seldom is there more than one individual per flock.

DIET: LSUMZ Louisiana specimens with stomach contents noted on the labels are as follows: arthropods only (15, including one with 2 brownish caterpillars, 30 and 10 mm long, and one with 1 pentatomid) and arthropods + fruit parts (2). In winter, individuals have been noted eating the fruit of

Greenbriar (*Smilax* sp.) (B. Fontenot 1998) and Poison Ivy, and the wax coating of the fruit of Chinese Tallow-Tree (*Sapium sebiferum*).

TIMING OF MIGRATION: In coastal Cameron, individuals begin to arrive in late September, but no peak in numbers is detected until mid-December. This peak coincides with the Christmas Count period and its intensive field activity and so may be a sampling artifact; however, no such peak is seen for White-eyed Vireo, leading us to suspect that the mid-December peak may be real (Remsen et al. 1996). Curiously, most early fall dates are from the coast, rather than inland, where birds typically do not arrive until the last 10 days of October (Remsen et al. 1996.).

In spring, as in many land-bird species that winter in Louisiana, there is little evidence of any major movements. Near St. Gabriel, an increase in frequency of detection from the second week of March to early April (Remsen et al. 1996) may represent an influx of spring migrants.

HIGH COUNTS:

fall/early winter: 17, 17 Dec. 1988, "E. Jetty Woods," ca. 2 mi. S Cameron (S. W. Cardiff, C. L. Cummins, C. A. Marantz, J. V. Remsen); 10, 15 Dec. 1990, "E. Jetty Woods," ca. 2 mi. S Cameron (J. V. Remsen, S. W. Cardiff, A. W. Kratter, G. H. Rosenberg).

late winter: 5, 26 Jan. 1994, Venice area (S. W. Cardiff, D. L. Dittmann).

spring: 5, 26 Mar. 1992, Cameron (C. A. Marantz, A. W. Kratter).

BAREPARTS: (N = 19) Iris: dark brown, brown. Maxilla: black, blackish, dark gray, dark slate; four females described as also having pale tomia. Mandible: usually (always?) bicolored, with a pale base (gray, blue-gray, leaden blue, pale leaden blue, pale gray, silver-horn) and dark tip (varying in extent from just the tip to the distal half; black, blackish, dark gray, dark slate, horn-brown). Tarsi and toes: blue-gray, gray, leaden blue, slate gray, dark gray (one bird with toes described as more bluish than tarsi).

BODY MASS: Our data (Appendix 1) suggest that differences in body mass among fat classes might not be as great in Blue-headed Vireo as in other vireos; the absence of any individuals in the two highest fat classes is also striking, given that species with much smaller sample sizes have multiple individuals in the highest categories.

SUBSPECIES: Louisiana birds are primarily the widespread "Blue-headed Vireo" of eastern North America, *V. s. solitarius*. However, *V. s. alticola* (the subspecies that breeds in the Appalachians; it is similar to typical "Blue-headed Vireo" of the eastern United States, but its bill is longer and wider, and its back is usually clouded with slaty) has also been recorded: 7 LSUMZ and USNM specimens (Remsen et al. 1996), 18 Nov. - 30 Mar., all from a limited area of eastern Louisiana: *W. Baton Rouge*, *E. Baton Rouge*, *W. Feliciana*, *Livingston*, *Orleans* (2), and *Washington* (2).

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UNSUBSTANTIATED, DUBIOUS, OR ERRONEOUS RECORDS: 1 Aug. 1893, New Orleans (in Oberholser 1938); 3 Aug. 1902, Diamond, *Plaquemines* (in Oberholser 1938).

[?Cassin's Vireo *Vireo cassinii*]

STATUS AND HABITAT: One record, from fall in southwestern Louisiana. Although the authors think that the identification as Cassin's Vireo is correct, at least one other expert thinks that the specimen is an unusually dull Blue-headed Vireo. Genetic analyses of the specimen are planned, and so the controversy will should be resolved soon.

RECORDS:

- (im ♂) 20 Sep. 1987, Garner Ridge, 3 mi. W Johnsons Bayou School, Cameron (D. L. Dittmann, S. W. Cardiff {coll.}; Purrington 1988; LSUMZ 135161).

DIET: The Louisiana specimen's stomach contained insect parts, including a large green caterpillar.

BARE PARTS: (N = 1) Iris: dark brown. Maxilla: black. Mandible: gray, blending to black top. Tarsi and toes: leaden blue.

NOTE: We follow the AOU (1998) in treating this taxon as a full species.

Plumbeous Vireo *Vireo plumbeus*

STATUS AND HABITAT: One record, from fall in southwestern Louisiana.

RECORDS:

- (im ♀) 16 Sep. 1984, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School, Cameron (J. V. Remsen; Purrington 1985, Schulenberg 1988; LSUMZ 118774; identification confirmed by Allan R. Phillips, Ned K. Johnson; Remsen et al. 1996).

DIET: The Louisiana specimen's stomach contained insect parts.

BARE PARTS: (N = 1) Iris: dark brown. Maxilla: black. Mandible: leaden blue with distal third black. Tarsi and toes: leaden blue.

SUBSPECIES: The Louisiana specimen is *V. p. plumbeus* of the western United States and most of Mexico (sensu Phillips 1991).

NOTE: See Johnson (1995) for reasons for treatment of this taxon as a species separate from Solitary Vireo.

Yellow-throated Vireo *Vireo flavifrons*

STATUS AND HABITAT: Uncommon breeding species in central and northern Louisiana; rare to casual breeder in southern Louisiana. In migration, uncommon state-wide; even in major spring "fall-outs" of migrants on the coast, seldom are more than 5-10 individuals seen in a day. However, high counts from

Grand Isle (see below) suggest that spring migrants are more common on the southeastern coast than on the southwestern coast, where the high count from 91 day-long surveys in Cameron from 18 March to 14 May is only 12 individuals (Remsen et al. 1996). Preferred breeding habitats are characterized by tall trees in open woodland (see below for details). Does not breed in continuous, closed-canopy forest, where it seems to be replaced by Red-eyed Vireo. In migration, more widespread, but still prefers treetops.

The breeding habitat of the Yellow-throated Vireo in the United States is typically described as mainly or primarily mature deciduous forest (e.g., Mengel 1965, Sutton 1967, Sprunt and Chamberlain 1970, Imhof 1976a, Dinsmore et al. 1984, Graber et al. 1985, James and Neal 1986, Bohlen 1989, Peterjohn 1989, Robbins 1991, Robbins and Easterla 1992). Williamson (1971) found that in Maryland, Yellow-throated Vireo occupied higher strata of the forest than Red-eyed Vireo. Bent (1950), however, reported that in Massachusetts, Yellow-throated Vireo was not really a forest species but an "edge" species. Likewise, Godfrey (1966) considered it a bird of "open stands of mature deciduous trees," and Stevenson and Anderson (1994) described its Florida breeding habitat as "open hardwoods and mixed woodlands." Our experience with Yellow-throated Vireo in Louisiana differs from that of most authors and is in accord with Bent, Godfrey, and Stevenson and Anderson. Although certainly a high-canopy species, it is not found in continuous, closed-canopy forests. Instead, we find it in three situations: (1) forest edge, especially where tall trees are isolated from the main body of forest; (2) open pine woodland mixed with tall hardwoods; and (3) the periphery of large tree-falls within continuous forest. On 1 June 1983 at the Tensas National Wildlife Refuge, Madison Parish, Remsen and R. B. Hamilton walked for 7 hours through about 10 linear km of mainly continuous, mature, bottomland forest and counted 65 singing Red-eyed Vireos and only 3 Yellow-throated Vireos; the latter were found at tree-falls large enough to create a substantial sunny edge within the forest. Yellow-throated Vireo is a much less common bird than Red-eyed Vireo throughout its range, including during migration on the Louisiana coast, where the ratio of Yellow-throated to Red-eyed records in our surveys (Remsen et al. 1996) during their overlap period in spring is 130:1533, or about 1:12. Thus, we suspect that the true habitat of Yellow-throated Vireo is much more restricted than simply "forest" and that careful observations will show that the species is found primarily in edge situations.

There are no documented records after early November, much less in winter. Although there are numerous sight records from early November through the winter (not only in Louisiana but in many other southern states), these almost certainly refer to bright male Pine Warblers or, less commonly, Yellow-breasted Chats (see Remsen et al. 1996).

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Although currently considered a transient only in the New Orleans area (Purrington MS), records from the early part of the century in late May and June suggest that it nested there occasionally (H. H. Kopman; Oberholser 1938).

SIGNIFICANT RECORDS:

early spring in southern Louisiana:

- 14 Mar. 1991, New Orleans (D. P. Muth; Muth 1991)
- 15 Mar. 1953, New Orleans (H. B. Chase; ABF)
- (♂) 17 Mar. 1941, New Orleans (T. D. Burleigh; LSUMZ 4812)
- 19 Mar. 1955, Kenner, *Jefferson* (H. B. Chase; ABF)

early spring in central Louisiana:

- 12 Mar. 1952, Bains, *W. Feliciana* (J. Bruns; ABF)
- (♂) 12 Mar. 1962, Baton Rouge (Mrs. G. C. Taylor; LSUMZ 27669, exchanged by G. H. Lowery, Jr. to Estación Biología de Rancho Grande, Venezuela)
- (♂) 13 Mar. 1943, Hoo-Shoo-Too, *E. Baton Rouge* (A. W. Burdick; Lowery 1947, LSUMZ 7887)
- (♂) 18 Mar. 1945, Baton Rouge (T. D. Burleigh; USNM 379654)
- 21 Mar. 1992, 3.7 mi. N St. Gabriel, *Iberville* (J. V. Remsen; Remsen et al. 1996)
- (♂) 22 Mar. 1942, 6 mi. W Baton Rouge, *W. Baton Rouge* (M. L. Miles; LSUMZ 13663)

early spring in northern Louisiana:

- 13 Mar. 1972, Natchitoches (R. B. Hamilton; ABF)
- 17 Mar. 1953, near Shreveport (H. H. Jeter; ABF)
- (2) 26 March 1995, Allen Quad, *Natchitoches* (C. E. Lyon)
- 31 Mar. 1929, Monroe (Lowery 1931)
- 31 Mar. 1996, west of Ruston, *Lincoln* (R. Seidler, V. LeFevers)

late spring in southern Louisiana:

- (♀) 6 May 1990, "East Jetty Woods," 2 mi. S Cameron (S. W. Cardiff; LSUMZ 152126)
- 14 May 1997, *Cameron* (S. W. Cardiff; Cardiff 1997b)
- 16 May 1891, New Orleans (Oberholser 1938; specimen collected, whereabouts unknown)
- 16 May 1993, Grand Isle (A. E. Smalley, G. B. Smalley; ABF)
- 16 May 1997, New Orleans (R. D. Purrington; Cardiff 1997b)
- 20 May 1997, N. Breton Island, *Plaquemines* (P. Yaukey, D. P. Muth; Cardiff 1997b)

late spring migrants or breeding season wanderers:

- (♂) 2 June 1982, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School, *Cameron* (J. V. Remsen; Jackson 1982; LSUMZ 105521)

- 11 June 1982, Barataria Unit, Jean Lafitte Nat. Hist. Park (R. D. Purrington, J. Reinoehl, D. P. Muth, N. Nelkin; Purrington MS)

early fall in southern Louisiana:

- 4 Aug. 1937, New Orleans (T. D. Burleigh; Oberholser 1938; USNM 341370)

late fall northern Louisiana:

- 15 Oct. 1989, Bickham-Dickson park (C. E. Lyon)
- (2) 17 Oct. 1993, Richard Fleming Park, Shreveport (R. Seidler; ABF)
- 30 Oct. 1993, Richard Fleming Park, Shreveport (R. Seidler; ABF)

late fall central Louisiana:

- 7 Oct. 1996, Acadiana Park, Lafayette (P. Conover)
- 24 Oct. 1993, 3.7 mi. N St. Gabriel (J. V. Remsen; ABF)

late fall southern Louisiana:

- (♀) 25 Oct. 1987, East Jetty Woods, 2 mi. S Cameron (S. W. Cardiff, D. L. Dittmann; LSUMZ 135163)
- (u) 27 Oct. 1984, Garner Ridge, 3 mi. W Johnsons Bayou School (T. S. Schulenberg; LSUMZ 122552)
- 28 Oct. 1972, Johnsons Bayou (R. B. Hamilton; Purrington 1973)
- (♀) 28 Oct. 1984, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School (S. W. Cardiff; LSUMZ 121885)
- 28 Oct. 1985, Barataria Unit, Jean Lafitte Nat. Hist. Park (D. P. Muth; ABF)
- (♂) 31 Oct. 1940, New Orleans (T. D. Burleigh; USNM 364037)
- 2 Nov. 1985, Barataria Unit, Lafitte Nat. Hist. Park (D. P. Muth, C. Lyon; ABF)
- 3 Nov. 1985, City Park, New Orleans (A. E. Smalley, G. B. Smalley; Purrington 1986)
- 4 Nov. 1984, New Orleans (P. Wallace; Purrington MS)

DIET: Perhaps the most insectivorous of Louisiana vireos; no records of frugivory. LSUMZ stomach contents: arthropods (N = 7, including one with caterpillars and Coleoptera)

TIMING OF MIGRATION: Except at Grand Isle, seldom are more than a few individuals seen, even in major fall-outs, and so peaks are difficult to detect. The Grand Isle high counts suggest that roughly the last 10 days of March and first 10 days of April represent the peak of spring migration. Peak counts on the *Cameron* coast, however, are from extreme late March to late April (Remsen et al. 1996), suggesting that migration there may be slightly later. Additionally, none of the early dates for spring migrants (see above) are from the southwestern coast despite intensive coverage there. Inland, near St. Gabriel, the first influx is typically noted in the third week of March, but no peaks are detected (Remsen et al. 1996). Extremely scarce on *Cameron* coast in fall, with no peaks detectable during a protracted migration period from late

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August to late October (Remsen et al. 1996). Inland, near St. Gabriel, no fall peak is detected, and most birds have left by late September, substantially earlier than on the coast (Remsen et al. 1996).

HIGH COUNTS:

SPRING MIGRATION: 200 (exceptional), 8 Apr. 1961, Grand Isle (S. A. Gauthreaux; Newman 1961b); 50, 11 Apr. 1978, Grand Isle (M. Myers, N. Nelkin, J. Reinoehl; ABF); 35, 21 Mar. 1992, Grand Isle (M. Weber, R. J. Stein, R. F. Cambre; ABF).

BREEDING: 15, 31 May 1986, Plettenberg BBS, *W. Feliciana* (P. McKenzie, E. M. Butler); 13, 4 June 1983, Plettenberg BBS, *W. Feliciana* (P. McKenzie, E. M. Butler); 9, 27 May 1994, Atchafalaya River BBS, *St. Martin & Pointe Coupee* (J. V. Remsen, A. W. Kratter).

FALL MIGRATION: 6, 29 Aug. 1986, Grand Isle (A. E. Smalley, G. B. Smalley; ABF); 3, 9 Sept. 1995, Shreveport (R. Seidler; ABF); no other record of more than 2/day.

BARE PARTS: (N = 9). Iris: dark brown. Maxilla: black, sometimes with bluish edges; gray with black culmen. Mandible: usually bicolored, leaden blue or gray at base blending to distal third dark gray or black; one all-leaden-blue. Tarsi and toes: leaden blue, gray, or blue-gray.

BODY MASS: Our data (Appendix 1) show that individuals may be able to increase their mass by more than 50% by addition of subcutaneous fat. Dunning's (1993) mean mass of 18.0 g seems high compared to our individuals with "no" or "light" fat, but more data are needed.

UNSUBSTANTIATED, DUBIOUS, OR ERRONEOUS RECORDS: 2 Mar. 1870, Rigolets, *Orleans* (Oberholser 1938; specimen collected, whereabouts unknown); "at least five records in December, January, and February ... from the southern part of the state" (Lowery 1974); 25 Jan. 1958, Thibodaux (in Newman 1959b); 3-8 Feb. 1961, Baton Rouge (in Newman 1961a); 23 Dec. 1962 (New Orleans CBC; in James 1963); 10 Feb. 1974, St. Francisville (in Hamilton 1974); (2 - not even bold-faced as unusual, no details) 18 Dec. 1974 (Monroe CBC); (2) 19 Dec. 1982 (Pine Prairie CBC; also in Ortego 1983); 2 Jan. 1984 (Grand Isle CBC; also in Myers and Muth 1984); 22 Dec. 1984 (Baton Rouge CBC; also in Newman 1985); 18 Dec. 1988 (Pine Prairie CBC).

Warbling Vireo *Vireo gilvus*

STATUS AND HABITAT: Currently a rare spring migrant and casual fall migrant along southwestern coast in chenier woods, and a rare to uncommon spring migrant in northwestern Louisiana. Only a few records from elsewhere in the state in the last 20 years. This pattern of geographic occurrence strongly suggests that it is a circum-Gulf migrant. Casual in southern Louisiana in winter.

Formerly a fairly common breeding bird in Louisiana but now evidently nearly extirpated for unknown reasons (Remsen et al. 1996). The only recent presumed breeding birds have been found in cottonwood-willow associations in *Pointe Coupee*.

SIGNIFICANT RECORDS:

early spring in southern Louisiana:

- 9 Apr. 1925, New Orleans (Oberholser 1938)
- (2) 12 Apr. 1959, Grand Isle (S. A. Gauthreaux; Newman and Warter 1959)
- (3) 14 Apr. 1995, "Peveto Beach Woods," *Cameron* (B. Fontenot; Cardiff 1995c)
- 16 Apr. 1961, Venice (M. Myers et al.; ABF)
- (2) 16 Apr. 1985, "Peveto Beach Woods," *Cameron* (P. McKenzie; ABF)
- 17 Apr. 1989, "Peveto Beach Woods," *Cameron* (R. Bacon; ABF)
- 17 Apr. 1993, Grand Isle (M. Myers, C. Sorrells; ABF)
- (4) 18 Apr. 1959, Grand Isle (S. A. Gauthreaux; Newman and Warter 1959)

early spring in northern Louisiana:

- (2) 1 Apr. 1956, near Shreveport (H. H. Jeter; ABF)
- 5 Apr. 1930, Monroe (Lowery 1931)
- 7 Apr. 1931, Monroe (Lowery 1931)
- 15 Apr. 1929, Shreveport (H. H. Kopman; Oberholser 1938)

late spring:

- 10 May 1989, Bickham-Dickson park (C. E. Lyon)
- 13 May 1995, Wallace Lake, *Caddo* (C. E. Lyon)
- (6, at least 1 ♂) 19 May 1986, Johnsons Bayou area (G. H. Rosenberg, W. Howe; Imhof 1986; LSUMZ 130585)

recent spring away from western tier of parishes

- 12 Apr. 1983, Comite River, *E. Baton Rouge* (P. McKenzie, V. Yurkunas; ABF)
- (2) 24-25 Apr. 1995, ca. 5 mi. E Carencro, Lafayette (B. Fontenot; Cardiff 1995c)
- 26 Apr. 1996, 3.7 mi. N St. Gabriel (J. V. Remsen; Muth 1996, Cardiff 1997c)
- 25 Apr. 1998, 4 mi. N St. Gabriel (DLD, SWC)

recent summer:

- 9 June 1984, Plettenberg Road, *W. Feliciana* (P. McKenzie, M. Butler; ABF)
- (singing) 22 May 1994, ca. 2 mi. S Krotz Springs, Atchafalaya R., *St. Landry* (D. P. Muth, M. Myers, C. Sorrells, G. B. Smalley; Muth et al. 1994, ABF)
- (3) 19 May 1995, East Point Quad, *Red River* (H. H. Jeter, C. E. Lyon).
- (singing) 21 May 1995, Chamblee Quad, *Tensas* (P. Dickson)

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- 7 May and 8 June 1995, near Gilliam, *Caddo* (R. Seidler)
 - 19 May and 7 June 1995, Lac Sainte Agnes Quad, *Avoyelles* (D. A. Wiedenfeld)
 - 31 May 1996, *Rapides* (R. J. Breedlove; Muth 1996)
- fall (away from breeding localities):
- 27 Aug. 1995, Peveto Beach Woods (P. Wallace, C. Sorrells; Cardiff 1996)
 - (im. ♂) 30 Aug. 1986, 0.5 mi. N Johnsons Bayou School (D. P. Muth, S. W. Cardiff [coll.], D. L. Dittmann; Purrington 1987; LSUMZ 131145)
 - (5) 3 Sep. 1956, Shreveport area (J. R. Stewart, M. Turk; Newman 1957a, ABF)
 - (im. ♀) 6 Sep. 1987, *Cameron* (K. V. Rosenberg; Purrington 1988; LSUMZ 135155)
 - (im. ♂, ♀) 13 Sep. 1987, Garner Ridge, 3 mi. W Johnsons Bayou School (S. W. Cardiff, D. L. Dittmann; LSUMZ 135156-57)
 - 14 Sep. 1960, New Orleans (S. A. Gauthreaux; Purrington MS)
 - 15 Sep. 1986, Garner Ridge, 3 mi. W Johnsons Bayou School (S. W. Cardiff; ABF)
 - 15 Sep. 1995, Ft. Jackson, *Plaquemines* (D. L. Dittmann, S. W. Cardiff; Cardiff 1996)
 - (2) 19 Sep. 1987, Willow Island, ca. 7 mi. E Cameron (S. W. Cardiff, D. L. Dittmann; ABF)
 - (2 im. ♀) 19 Sep. 1987, "E. Jetty Woods," ca. 2 mi. S Cameron (S. W. Cardiff, D. L. Dittmann; LSUMZ 135159-135160)
 - (ad. ♀) 20 Sep. 1987, Garner Ridge, 3 mi. W Johnsons Bayou School, *Cameron* (S. W. Cardiff, D. L. Dittmann; LSUMZ 135158)
 - 22 Sep. 1987, Whiskey Bay Road, *Iberville* (J. B. Dunning, R. Bowers; ABF)
 - 25 Sep. 1994, "Peveto Beach Woods," *Cameron* (D. L. Dittmann, S. W. Cardiff; Cardiff 1995)
 - 30 Sep. 1984, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School (D. P. Muth; ABF)
 - 3 Oct. 1948, River Road, Baton Rouge (R. Moore; Lowery 1949, ABF)
 - 12 Oct. 1986, East Jetty Woods, ca. 2 mi. S Cameron (D. L. Dittmann, S. W. Cardiff; ABF)
 - (im. ♂) 12 Oct. 1990, ca. 5 mi. E Cameron (S. W. Cardiff, D. L. Dittmann; LSUMZ 152134)
 - (2) 15 Oct. 1959, New Orleans (S. A. Gauthreaux; Newman 1960a)
 - 8 Nov. 1996, Lafayette (P. E. Conover, D. Patton; Jackson 1997, Cardiff 1997d)

early winter records:

- 11 Nov. 1994, Ft. Jackson, *Plaquemines* (S. W. Cardiff, D. L. Dittmann; Cardiff 1995a, Jackson 1995)
- 24 Nov. 1961, Venice (S. A. Gauthreaux; ABF)
- 19 Dec. 1990, Bayou Grand Marais area, *Vermilion* (G. H. Rosenberg; Crowley CBC)

winter records:

- 26 Dec. 1993 - 22 Jan. 1994, near Creole, *Cameron* (PC; videotape examined by authors)
- (♀) 26 Jan. 1994, 1/2 mi. S Ft. Jackson, *Plaquemines* (S. W. Cardiff, D. L. Dittmann; Stedman 1994; LSUMZ 159815)

DIET: Primarily insectivorous. LSUMZ stomach contents: arthropods only (N= 9, including 1 with Coleoptera, 2 with caterpillars). The bird attempting to winter near Creole was observed to mouth Chinese Tallow-Tree fruits (B. Vermillion, fide B. Fontenot).

TIMING OF MIGRATION: Late dates for this species in its former breeding areas were 30 August in the Baton Rouge region (Lowery 1947) and 7 September in Monroe (Lowery 1931). Peak numbers on the *Cameron* coast in spring are typically in the last 10 days of April. So few fall records exist that timing in fall is difficult to judge; perhaps mid-September is the peak.

HIGH COUNTS:

SPRING MIGRATION: 10, 2 May 1995, Bickham-Dickson park (C. E. Lyon); 6, 20 Apr. 1986, *Cameron* (P. Lehman et al.; Imhof 1986); 4, 28 Apr. 1990, ca. 5 mi. E Cameron (T. A. Parker, S. W. Cardiff; ABF).

BREEDING: 3, 19 May 1995, East Point Quad, *Red River* (H. H. Jeter, C. E. Lyon).

BARE PARTS: (N = 9) Iris: dark brown. Maxilla: black, brownish black, dark grayish brown. Mandible: variable, none evenly colored, with pale (whitish, blue-gray, pale blue-gray, pale flesh) bases blending to dark (gray, gray-brown, brown, gray horn-brown, blackish gray) tips, often with lateral streaks. Tarsi and toes: leaden blue, blue-gray.

BODY MASS: Even with a small sample size, our data (Appendix 1) suggest that individuals may be able to increase their mass by at least 50% by addition of subcutaneous fat.

SUBSPECIES: All specimens except two are of the widespread eastern USA subspecies, *V. g. gilvus*. There are two records (Remsen et al. 1996) of *V. g. swainsonii*, the breeding form of much of western USA except the Great Basin:

- (♀) 13 Sep. 1987, Garner Ridge, 3 mi. W Johnsons Bayou School (S. W. Cardiff; LSUMZ 135157)

• (♀) 26 Jan. 1994, 1/2 mi. S Ft. Jackson, *Plaquemines* (S. W. Cardiff, D. L. Dittmann; Stedman 1994; LSMZ 159815)

The larger, grayer subspecies of the Rocky Mountain region, *V. g. brewsteri*, will almost certainly be found eventually as a vagrant in Louisiana.

UNSUBSTANTIATED, DUBIOUS, OR ERRONEOUS RECORDS:
23 Oct. 1908, Southwest Reef Lighthouse, *Plaquemines* (in Oberholser 1938);
4 Mar. 1918, Chenier au Tigre, *Vermilion* (in Oberholser 1938, Lowery 1974);
2 Apr. 1918, Laplace (in Oberholser 1938); 26 Mar. (no year), Baton Rouge region (in Lowery 1947); (2) 4 Nov. 1959, Grand Isle (in Newman 1960a); 31 May 1996, near Holloway, *Rapides* (Cardiff 1997c).

Philadelphia Vireo *Vireo philadelphicus*

STATUS AND HABITAT: In spring, uncommon migrant on coast (fairly common some springs in *Cameron*), rare to casual inland. In fall, uncommon to fairly common migrant inland, rare on coast. One early -winter and one late-winter record. Found primarily in deciduous forest, also in coastal chenier woods.

SIGNIFICANT RECORDS:

early spring in southern Louisiana:

• 20 Apr. 1986, *Cameron* (S. W. Cardiff; Remsen et al. 1996)

early spring in central Louisiana:

• 12 Apr. 1983, Comite River, *E. Baton Rouge* (P. McKenzie, M. M. Swan, V. Yurkunas; ABF)

• (2) 21 Apr. 1993, 4 mi. N St. Gabriel (D. L. Dittmann; Muth 1993)

early spring in northern Louisiana:

• 10 Apr. 1958, Shreveport (J. R. Stewart; ABF)

• 26 Apr. 1989, Cross Lake, *Caddo* (C. E. Lyon)

late spring in southern Louisiana:

• 16 May 1971, New Orleans (R. D. Purrington; Imhof 1971)

• (2) 20 May 1989, "East Jetty Woods," ca. 2 mi. S *Cameron* (S. W. Cardiff, D. L. Dittmann; ABF)

• (♀) 20 May 1993, "East Jetty Woods," 2 mi. S *Cameron* (S. W. Cardiff; LSMZ 159132)

• 21 May 1988, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School (K. V. Rosenberg; Imhof 1988, ABF)

late spring in northern Louisiana:

• (4) 18 May 1960, Shreveport (J. R. Stewart; Newman 1960b)

• (2) 22 May 1993, Spring Lake (C. E. Lyon)

• 30 May 1970, near Shreveport (H. H. Jeter; Imhof 1970)

early fall in northern Louisiana:

• 15 Sep. 1990, Bickham-Dickson park (C. E. Lyon)

- 21 Sep. 1991, Bickham-Dickson park (C. E. Lyon)

early fall in central Louisiana:

- (♀) 14 Sep. 1940, 5 mi. S University, *E. Baton Rouge* (E. Wallace; LSUMZ 4253)
- 14 Sep. 1995, 5 mi. S University, *E. Baton Rouge* (D. F. Lane, J. Babin; Jackson 1996, ABF)

early fall in southern Louisiana:

- 12 Sep. 1987, Grand Isle (N. Nelkin, A. E. Smalley, G. B. Smalley; Purrington 1988)
- 13 Sep. 1964, New Orleans (S. A. Gauthreaux; Purrington MS)
- 14 Sep. 1991, City Park, New Orleans (P. Yaukey; ABF)

late fall in northern Louisiana:

- 15 Oct. 1989, Bickham-Dickson park (C. E. Lyon)
- 16 Oct. 1993, Bickham-Dickson park (C. E. Lyon)

late fall in central Louisiana:

- 4 Nov. 1990, 3.7 mi. N St. Gabriel (J. V. Remsen; ABF)
- 6 Nov. 1996, Lafayette (P. E. Conover; Cardiff 1997d)

late fall in southern Louisiana:

- (ad. ♂) 5 Nov. 1989, "Peveto Beach Woods," *Cameron* (K. V. Rosenberg, T. S. Sillett, R. T. Brumfield; LSUMZ 152133)
- 9 Nov. 1985, *Orleans* (N. Nelkin; Purrington 1986)
- 12 Nov. 1968, Venice (K. P. Able; Purrington 1969)
- (im. ♀) 13 Nov. 1983, Hackberry Ridge, 2.5 mi. WSW Johnsons Bayou School (T. A. Parker, J. V. Remsen; Purrington 1984; LSUMZ 113120)

early winter records:

- 3 Dec. 1960, Peveto Beach, *Cameron* (S. A. Gauthreaux; Newman 1961a, Lowery 1974)

late winter records:

- (♀) 5 Feb. 1961, Buras, *Plaquemines* (S. A. Gauthreaux; Newman 1961a, Gauthreaux 1962; LSUMZ 23778); this is one of the only valid winter records of this species for the United States.

DIET: Primarily insectivorous in spring; in fall, insectivorous but also adds fruit to diet, e.g. Spicebush, Virginia Creeper (*Parthenocissus quinquefolia*; B. Fontenot, pers. comm.), Roughleaf Dogwood (*Cornus drummondii*). LSUMZ stomach contents: arthropods only (N=21); arthropods with fruit seeds or parts (N=6); and fruit seeds or parts (N=1); 9 stomachs contained caterpillars, up to 35 mm long. All but one of the stomachs containing fruit were from inland Louisiana in fall.

TIMING OF MIGRATION: Spring migration in coastal *Cameron* peaks in late April and early May. In fall, Lowery (1974) indicated the species was "uncommon" starting 2 August, becoming "common" in late August and

remaining common through mid-October, and then remaining "uncommon" to late October. This conflicts drastically with our experience over the last 15 years. We believe that Lowery erred in placing faith in unsubstantiated old records from early August. Our data (Remsen et al. 1996) show that peaks inland near St. Gabriel from late September to late October, and migrants in coastal Cameron are found primarily during the same period. This timing is consistent with data from adjacent states (Remsen et al. 1996).

HIGH COUNTS:

SPRING MIGRATION: 50, 7 May 1960, Shreveport (J. R. Stewart; Newman 1960b); 40, 6 May 1990, *Cameron* (S. W. Cardiff, D. L. Dittmann, C. A. Marantz; Jackson 1990); 25, 30 Apr. 1989, ca. 5 mi. E Cameron (S. W. Cardiff, D. L. Dittmann; ABF).

FALL MIGRATION: 10, 4 Oct. 1987, Manchac Point, *Iberville* (J. V. Remsen, J. M. Bates, K. V. Rosenberg); 8, 1 Oct. 1986 *Cameron* (S. W. Cardiff; Remsen et al. 1996); 5, 11 Oct. 1987, Manchac Point, *Iberville* (J. V. Remsen, S. W. Cardiff, D. L. Dittmann, P. P. Marra).

BARE PARTS: (N = 24) Iris: dark brown, brown, or chocolate. Maxilla: black, blackish, brownish black, dark slate, or dark brown (occasionally with pale tomium). Mandible: variable, almost always paler than maxilla; main color ranges from gray, blue-gray, dark slate, and leaden blue to pale horn, silvery blue, and whitish; about half described as evenly colored, the others not, often with darker tips, and occasionally with lateral streaks or paler bases (occasionally with pale tomium). Tarsi and toes: gray, blue-gray, leaden gray, leaden blue, dark leaden blue, or blue-slate.

BODY MASS: Our data (Appendix 1) show that individuals may be able to increase their mass by nearly 100% by addition of subcutaneous fat. Dunning's (1993) mean mass of 12.2 g is high compared to our individuals with "no" or "light" fat, and because his sample came from a locality where only migrants are expected, it is almost certainly biased by inclusion of fat individuals.

UNSUBSTANTIATED, DUBIOUS, OR ERRONEOUS RECORDS: 2 Aug. 1893, Hester, *St. James* (in Oberholser 1938; "specimen" whereabouts unknown); ("a few individuals") "late in July" 1893, Covington. *St. Tammany* (in Oberholser 1938); ("abundant") 2 Aug. 1893, Covington. *St. Tammany* (in Oberholser 1938); 24 August (no year), Baton Rouge region (in Lowery 1947); (2) 9 Apr. 1955, *Cameron* (in Newman 1955c); 25 Mar. 1961, Grand Isle (in Newman 1961b); 17 Dec. 1977 (Sabine NWR CBC).

Red-eyed Vireo *Vireo olivaceus*

STATUS AND HABITAT: Common breeding species in northern and central Louisiana; in southern Louisiana, uncommon to fairly common in

Mississippi and Atchafalaya basins, but rare elsewhere. In migration, uncommon to fairly common inland, and on coast, uncommon to abundant in spring, and uncommon to common in fall. Casual in early winter on coast. Breeds primarily in mature deciduous forest or riparian forest dominated by cottonwoods; casual breeder in coastal woods. Migrants may be found anywhere with trees or shrubs, although records from pine woods are few.

SIGNIFICANT RECORDS:

early spring in southern Louisiana:

- 16 Mar. 1985, Grand Isle (R. D. Purrington, N. Nelkin; Purrington MS)
- 18 Mar. 1894, New Orleans area (Beyer 1900)
- 18 Mar. 1961, City Park, New Orleans (H. B. Chase; ABF)
- (20) 21 Mar. 1972, Grand Isle (M. Weber, R. J. Stein, R. F. Cambre; ABF)
- 21 Mar. 1991, Barataria Unit, J. Lafitte Nat. Hist. Park (D. P. Muth; ABF)
- (♂) 26 Mar. 1992, Willow Island, ca. 7 mi. E Cameron (A. W. Kratter; LSUMZ 154278)

early spring in central Louisiana:

- 18 Mar. 1978, e. of Bayou Pigeon, *St. Martin* (J. A. Jackson, C. D. Cooley; ABF)
- 19 Mar. 1871, Mandeville (in Oberholser 1938; specimen no longer extant, but examined by Oberholser in TU collection)
- 20 Mar. 1949, Amite River near Clinton, *E. Feliciana* (R. Moore; ABF)
- 21 Mar. 1991, 3.7 mi. N St. Gabriel (J. V. Remsen; Cardiff 1991)
- 22 Mar. 1933, Baton Rouge (G. H. Lowery, Jr.; Oberholser 1938)
- (♂) 22 Mar. 1944, 6 mi. S Erwinville, *W. Baton Rouge* (M. L. Miles; Lowery 1947, LSUMZ 6589)
- 22 Mar. 1995, Pineville, *Rapides* (K. Cummings)
- (♂) 25 Mar. 1944, "Nelson's Woods," LSU, Baton Rouge (R. E. Tucker; LSUMZ 9241)
- (♂) 25 Mar. 1964, Baton Rouge (S. A. Gauthreaux; TV-tower kill LSUMZ [skeleton] 48907)

early spring northern Louisiana:

- 30 Mar. 1996, Richard Fleming Park, Shreveport (R. Seidler; ABF)
- 30 Mar. 1996, South Lakeshore, Shreveport (R. Seidler; ABF)
- 3 Apr. 1993, Richard Fleming Park, Shreveport (R. Seidler; ABF)
- 4 Apr. 1981, near Many, Sabine (K. Cummings)
- 5 Apr. 1931, Monroe (Lowery 1931)

late spring:

- (18!) 31 May 1987, *Cameron* (D. L. Dittmann et al.; Imhof 1987)
- 1 June 1990, "East Jetty Woods," ca. 2 mi. S Cameron (A. W. Kratter, K. V. Rosenberg; ABF)

- (10) 1 June 1992, ca. 5 mi. E Cameron (S. W. Cardiff, D. L. Dittmann; Muth 1992b, ABF)
 - (3) 2 June 1992, Garner Ridge, 3 mi. WSW Johnsons Bayou School (S. W. Cardiff, D. L. Dittmann; Muth 1992b, ABF)
 - (2) 3 June 1992, "East Jetty Woods," ca. 2 mi. S Cameron (S. W. Cardiff, D. L. Dittmann; Muth 1992b, ABF)
 - 4 June 1990, Garner Ridge, 3 mi. WSW Johnsons Bayou School (S. W. Cardiff; ABF)
 - 4 June 1994, New Orleans (R. Seidler; ABF)
 - (♀) 5 June 1988, 0.3 mi. S Hwy. 27 at Johnsons Bayou (J. V. Remsen; LSUMZ 136054)
 - (♂) 5 June 1988, "East Jetty Woods," ca. 2 mi. S Cameron (S. W. Cardiff; LSUMZ 138331)
 - (♀) 7 June 1987, Garner Ridge, 3 mi. W Johnsons Bayou School (S. W. Cardiff, D. L. Dittmann; Jackson 1987; LSUMZ 134848)
- summer/breeding on coast:
- (pair, singing ♂, ♀ with enlarged gonads), 25 May 1995; 1 mi. E old mouth Mermentau River, Cameron (SWC, DLD; Cardiff 1995c; LSUMZ uncatalogued)
 - (pair fledged at least 1 young) June-July 1989, Grand Isle (D. P. Muth, G. B. Smalley, A. E. Smalley; Jackson 1989, ABF)
- early fall:
- (ad. ♂) 10 July 1985, "East Jetty Woods," ca. 2 mi. S Cameron (S. W. Cardiff; LSUMZ 122477)
 - 24 July 1994, New Orleans (D. P. Muth; Cardiff 1994, Purrington 1994)
- late fall northern Louisiana:
- (2) 30 Oct. 1993, Shreveport (R. Seidler, L. Cunningham; ABF)
- late fall central Louisiana:
- 29 Oct. 1989, 3.7 mi. N St. Gabriel (J. V. Remsen; Purrington 1990a)
 - 29 Oct. 1992, 4 mi. N St. Gabriel (D. L. Dittmann; ABF)
 - 31 Oct. 1995, Acadiana Park, Lafayette (P. Conover)
- late fall southern Louisiana:
- 1 Nov. 1969, Bonnet Carré Spillway (R. J. Stein; Purrington 1970)
 - 3 Nov. 1985, Bonnet Carré Spillway (R. J. Stein; ABF)
 - (2) 3 Nov. 1985, New Orleans (G. B. Smalley, A. E. Smalley; ABF)
 - (2) 5 Nov. 1989, Cameron (K. V. Rosenberg, T. S. Sillett, R. T. Brumfield; Purrington 1990a)
 - 8 Nov. 1964, Johnsons Bayou (S. A. Gauthreaux, A. W. Palmisano; ABF)
 - (im. ♂) 11 Nov. 1984, Monkey Island, 1 mi. SW Cameron (D. L. Dittmann, S. W. Cardiff, J. V. Remsen [coll.]; LSUMZ 121888)

- (im. ♂) 13 Nov. 1983, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School (A. P. Capparella, J. V. Remsen [coll.], T. A. Parker; LSUMZ 113123)
 - 13 Nov. 1988, Spanish Lake, *Iberia* (M. J. Musumeche; ABF)
- early winter records:
- 20 Dec. 1986 (J. Holmes, Jr., R. D. Purrington, C. Sloan; Sabine NWR CBC)

DIET: This species may be more frugivorous than other vireos in Louisiana. In spring, it is occasionally seen feeding on mulberry (*Morus* spp.) fruit. In fall it feeds regularly on the fruit of Roughleaf Dogwood, Spicebush, and (B. Fontenot 1998) Prickly Ash (*Zanthoxylum clava-herculis*). Beyer (1900) stated that it "feeds principally on Magnolia seeds in the fall, upon which they became exceedingly fat and well flavored." LSUMZ stomach contents: arthropods only (N= 50, including 6 with caterpillars, 1 with Orthoptera, 1 with Coleoptera); arthropods with fruit seeds or parts (N= 4, 3 of which are in fall); and fruit seeds or parts (N = 2, both fall, one identified as prickly ash).

TIMING OF MIGRATION: In spring, migration is extremely protracted with the first few birds arriving typically in the third week of March and some migrants noted into the first week of June. Peaks can occur over a lengthy period, from roughly 20 April to at least 20 May (Remsen et al. 1996), and Red-eyed Vireo can be the most common migrant passerine encountered from about 9 Apr. to 20 May. The mean duration of stopover times for 57 individuals studied in coastal Cameron Parish was 2.2 days, with four individuals remaining 7-9 days (Loria and Moore 1990). In fall, migrants have been found from 10 July to 14 November, with a slight peak from late August to the third week of September, both in coastal *Cameron* and inland near St. Gabriel (Remsen et al. 1996).

HIGH COUNTS:

SPRING MIGRATION: **100+**, 19 Apr. 1986, Cow Is., *Cameron* (P. McKenzie, R. Martin; Imhof 1986); **100**, 20 May 1993 (S. W. Cardiff, D. L. Dittmann); **50**, 11 Apr. 1978, Grand Isle (M. Myers, N. Nelkin, J. Reinoehl ABF); **50**, 5 May 1978, New Orleans (J. Reinoehl; ABF).

BREEDING: **103**, 23 May 1994, Atchafalaya River, *St. Martin & Pointe Coupee* (A. W. Kratter, J. V. Remsen); **69**, 3 June 1989, Atchafalaya River BBS *St. Martin & Pointe Coupee* (J. V. Remsen); **67**, 1 June 1983, Tensas NWR *Madison* (J. V. Remsen, R. B. Hamilton).

FALL MIGRATION: **100+**, 29 Aug. 1986, Grand Isle (A. E. Smalley, G. B. Smalley; Purrington 1987, ABF); **25**, 17 Sep. 1983, *Cameron* (J. V. Remsen et al.); **24**, 29 Aug. 1986, *Cameron* (S. W. Cardiff, D. L. Dittmann, D. P. Muth); **18**, 4 Sep. 1983, *Cameron* (J. V. Remsen, C. L. Cummins, G. H. Rosenberg, F. Tedford).

J. La. Ornith.

BARE PARTS: (N = 39) Iris: (adults): red, dark red, dull red, rufous, or brownish-red (imms.): brown or reddish-brown. Maxilla: black, blackish, dark brown, brownish black, dark gray, brown, blackish gray. Mandible: variable, always paler than maxilla; typically gray or blue-gray, sometimes leaden blue, pale gray, grayish horn, silvery blue, ivory, or whitish; 9 described as evenly colored, the rest not, often with darker tips, and occasionally with lateral streaks or paler bases. Tarsi and toes: mainly blue-gray, gray, or leaden blue; some dark gray, pale gray, grayish-horn.

BODY MASS: Our data (Appendix 1) show that individuals may be able to increase their mass by nearly 100% by addition of subcutaneous fat. Dunning's (1993) mean mass of 16.7 g is high compared to our individuals with "no" or "light" fat, and is clearly biased by inclusion of fat individuals (range to 25.1 g).

SUBSPECIES: The subspecies of the northern Great Basin, *V. o. canoviridis* (A.O.U. 1957), is expected to occur as a migrant in Louisiana. Examination of our extensive series of specimens from Louisiana shows that there is some within-season variation in crown color (paler in *canoviridis*), but we are unable to ascertain whether this is due to individual variation or the presence of a few *canoviridis* in our sample. Certainly the vast majority of the migrants in Louisiana are the widespread nominate subspecies.

UNSUBSTANTIATED, DUBIOUS, OR ERRONEOUS RECORDS: 3 Jan. 1965 (Venice CBC, in Lowery 1974); 17 Dec. 1983 (Sabine NWR CBC; in Myers and Muth 1984).

Yellow-green Vireo *Vireo flavoviridis*

STATUS AND HABITAT: Three records from southwestern coastal Louisiana.

RECORDS:

- 3 June 1990, Willow Island, ca. 7 mi. E Cameron (D. L. Dittmann; Purrington 1990b)
- (♂) 2-3 May 1992, Smith Ridge, ca. 3 mi. NW Johnsons Bayou School, Cameron (D. P. Muth, M. Myers, P. Yaukey, S. W. Cardiff [coll.], et al.; Muth 1992a; LSUMZ 154286)
- (2 singing) 3-7 July 1998, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School (J. D. Weckstein, J. Kleiman, B. Fontenot et al.)

TIMING OF MIGRATION: Interestingly, the only other specimen of Yellow-green Vireo for the central Gulf Coast was one from Pensacola on 4 May (1958; B. L. Monroe, Jr., F. Weston; Newman 1958b; LSUMZ 22492; Monroe 1959).

DIET: The Louisiana specimen had arthropods in its stomach.

BARE PARTS: The Louisiana specimen had a dull, dark red iris, a maxilla primarily dark gray-brown, a whitish-cream mandible with dark gray lateral streaks, and leaden blue tarsi and toes.

SUBSPECIES: The Louisiana specimen can be assigned to the nominate form (Remsen et al. 1996), which is widespread in Middle America.

Black-whiskered Vireo *Vireo altiloquus*

STATUS AND HABITAT: Casual migrant and summer visitor, perhaps occasionally breeding in scrubby thickets in Grand Isle and Delta NWR area; casual spring migrant in coastal chenier woods in *Cameron*. Two presumed breeding pairs were found at Delta NWR on 19 June and 4 July 1971 (Lowery 1974), and territorial singing males were found near New Orleans in summer 1997. Casual fall migrant at New Orleans.

Purrington (MS) noted that this species was not recorded in southeastern Louisiana before 1959. The first state record was not recorded until 1957. Thus it seems that the frequency of occurrence of this species has increased in the last 30 years. Although the Grand Isle area was undoubtedly the coastal locality most frequently visited by ornithologists in the first half of this century (e.g., see the number of references to Grand Isle in Oberholser [1938]), no Black-whiskered Vireos were recorded there until 1960. A historical increase in Louisiana would be consistent with the expansion of breeding range in Florida over the last century (Stevenson and Anderson 1994).

RECORDS:

Grand Isle area:

- (♂) 18 Mar. 1961 (S. A. Gauthreaux; Newman 1961b; LSUMZ 23781)
- 8 Apr. 1989 (M. Myers, C. Sorrells, A. E. Smalley, G. B. Smalley, J. Sevenair; Imhof 1989, Dittmann 1995)
- 1-7 May 1960, Grand Terre, *Jefferson* (D. G. Berrett, L. C. Binford, S. L. Warter; Newman 1960b, ABF)
- (3) 5 May 1963 (S. M. Russell, A. W. Palmisano; Imhof 1963; LSUMZ 32228)
- 5 May 1992, Fourchon Road, *Lafourche* (N. Nelkin, R. D. Purrington; ABF)
- 7 May 1966, 7 mi. SW Grand Isle, *Lafourche* (J. J. Morony; LSUMZ [skeleton] 51379)
- 8 May 1991 (G. B. Smalley, A. E. Smalley, C. Sorrells; Cardiff and Dittmann 1991, Muth 1991, Dittmann and Kleiman 1998)
- 14 May 1990 (G. B. Smalley, A. E. Smalley; Jackson 1990, Dittmann 1995)
- 18 May 1988 (D. P. Muth, N. Nelkin; Imhof 1988, Dittmann and Kleiman 1998)

- 19-22 May 1985 (M. Myers, N. Nelkin, N. L. Newfield, D. P. Muth; Imhof 1985)
- 25 May 1992 (D. P. Muth, R. D. Purrington, N. Nelkin; Dittmann and Kleiman 1998; ABF)
- 1 June 1997, Fourchon Road (R. D. Purrington, D. P. Muth; Purrington 1997)
- 14 June 1992 (M. Myers, R. D. Purrington, G. Gomez; Purrington MS)
- (3) 22-23 June 1985 (R. D. Purrington, A. E. Smalley, G. B. Smalley, J. Sevenair; Purrington MS; presumably involving same bird as 19-22 May record above)
- (1-2, possibly carrying food) 8 July - 12 Aug. 1990 (D. P. Muth, G. Craft, R. D. Purrington, N. Nelkin; Purrington 1990b)
- summer 1990 (T. A. Parker; different from above, Purrington MS)
- 16 July 1988 (D. P. Muth, G. B. Smalley; Purrington 1989)
- 14-26 July 1992 (M. Myers, N. Nelkin, R. D. Purrington, G. Gomez; ABF, Purrington MS)
- (2) 12 Aug. 1990 (D. P. Muth; Jackson 1991)
- 17 Aug. 1988 (D. P. Muth, A. E. Smalley, G. B. Smalley; Purrington MS)

Cameron Parish:

- (♀) 16 Apr. 1993, 0.3 mi. S Hwy. 82 at Johnsons Bayou (mist-net casualty from "Use of Stopover Habitat by Neotropical Migrant Landbirds" project; Dittmann and Kleiman 1998; LSUMZ 159436)
- 17 Apr. 1967, "East Jetty Woods," ca. 2 mi. S Cameron (S. A. Gauthreaux, L. C. Binford, B. Buskirk, G. Strickland; Imhof 1967, ABF)
- (♂) 19 Apr. 1964, "East Jetty Woods," 2 mi. S Cameron (K. A. Arnold; Imhof 1964; LSUMZ 32430 [mount])
- (♂) 20 Apr. 1986, "East Jetty Woods," ca. 2 mi. S Cameron (P. Lehman, S. W. Cardiff [coll.] et al.; Imhof 1986 [including photo by Lehman], Dittmann 1990; LSUMZ 130583)
- 25 Apr. - 2 May 1976, Johnsons Bayou (R. J. Stein, R. J. Newman et al.; Imhof 1976b; ABF)
- (♀) 26 Apr. 1957, 3.5 mi. E Cameron (A. Wolfson; Newman 1957b; LSUMZ 22064)
- (♂) 26 Apr. 1964, 3 mi. ESE Johnsons Bayou (S. A. Gauthreaux; Imhof 1964; LSUMZ 32930)
- 26 Apr. 1970, Cameron (R. D. Purrington, K. Eyster [coll.] et al.; Imhof 1970; LSUMZ 155577)
- (♂) 26 Apr. 1986, Cow Is., 1 mi. W, 1/2 mi. N Rockefeller Refuge hdqtrs. (B. Daniels, S. W. Cardiff [coll.] et al.; Dittmann 1990; LSUMZ 130584)
- 27 Apr. 1963, "Peveto Beach Woods," *Cameron* (S. A. Gauthreaux; Imhof 1963, Dittmann 1990)

- 27 Apr. 1986, Garner Ridge, 3 mi. W Johnsons Bayou School (P. Lehman, D. P. Muth, S. W. Cardiff, D. L. Dittmann, C. A. Marantz, L. Bevier, B. Daniels, D. Willick; Dittmann 1990)
- 27 Apr. 1986, "East Jetty Woods," ca. 2 mi. S Cameron (M. Myers et al.; Dittmann 1995)
- 28 Apr. 1990, "East Jetty Woods," ca. 2 mi. S Cameron (T. A. Parker; Jackson 1990)
- (♂) 30 Apr. 1966, "Peveto Beach Woods" (S. A. Gauthreaux, A. W. Palmisano; Imhof 1966; LSUMZ 51251)
- 4 May 1990, Hackberry Ridge, 2 mi. WSW Johnsons Bayou School (T. A. Parker; Jackson 1990)
- 5 May 1993, "East Jetty Woods," ca. 2 mi. S Cameron (Gary Broussard; videotape examined by S. W. Cardiff, D. L. Dittmann, J. V. Remsen)
- 11 May 1963 (A. R. Tabor, E. Levi; Imhof 1963)
- (♂) 5 June 1988, Garner Ridge, 3 mi. W Johnsons Bayou School (J. V. Remsen; Jackson 1988, Dittmann 1995; LSUMZ 136055)
- (♀) 6 June 1988, ca. 5 mi. E Cameron (S. W. Cardiff, D. L. Dittmann; Jackson 1988, Dittmann 1990; LSUMZ 138332)
- 6 June 1992, "Peveto Beach Woods," *Cameron* (G. B. Smalley, A. E. Smalley, J. Sevenair, P. Wallace, C. Sorrells; Muth 1992b, ABF)

other coastal:

- (apparently territorial) 19 June 1971, Delta NWR (J. S. Woodall, H. D. Pratt, J. H. Bartee et al.; Stewart 1971)
- (2) 4 July 1971, Rafael Pass, Delta NWR, different site from above (J. Farrand, R. J. Newman, C. Spear et al.; Stewart 1971, ABF)

non-coastal:

- (2 singing males) 27 May - 12 June 1997, Harahan, *Jefferson* (P. Yaukey et al; Cardiff 1997a, Purrington 1997)
- (singing male) 7-8 July 1997, Bonnet Carré Spillway (R. J. Stein, T. Sylvest, J. Sylvest; Purrington 1997)
- 29 Aug. 1959, City Park, New Orleans (S. A. Gauthreaux, M. E. Lewis; Newman 1959a, Lowery 1974).
- (♂) 17 Aug. 1963, Junction Paris Rd. and Morrison Rd, *Orleans* (A. W. Palmisano; Lowery 1974; LSUMZ 31221).

TIMING OF MIGRATION: Records of spring migrants in *Cameron* show a distinct peak in late April, whereas those from the Grand Isle area are spread more-or-less evenly through the spring and summer (Remsen et al. 1996). The only certain fall migrants (New Orleans) were recorded on 17 and 29 August.

BARE PARTS: (N = 4). Iris: dark red, red-brown. Maxilla: dark gray, dark grayish-horn-brown, dark horn brown. Mandible: dark gray with paler grayish-

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flesh base; basal third dull horn blending to distal 2/3 dark gray; dark dull leaden blue; blue-gray with dull pinkish-ivory base. Tarsi and toes: blue-gray, bright gray, dull dark leaden blue, leaden blue.

BODY MASS: Even our small sample size (Appendix 1) suggests that some individuals may increase their mass by at least 75% by addition of subcutaneous fat.

SUBSPECIES: Remsen et al. (1996) found that 10 of the 12 study skins examined from Louisiana represent the subspecies expected to occur in Louisiana, *V. a. barbatulus*, which breeds in Florida, the Bahamas, and Cuba (Blake 1968). Two specimens, however, are *V. a. altiloquus*, the subspecies that breeds in the Greater Antilles; they represent only the second and third records of this subspecies from the United States. These two specimens are the ones collected in Cameron on 26 Apr. 1964 and 26 Apr. 1970 (see above).

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Appendix. Body weights (in grams) for some vireos collected in Louisiana. Codes for fat levels (see Introduction) are "no," "light," or

"light" fat; "mod/heavy" = "moderate" or "heavy" fat; vlv/ehv = "very heavy" or "extremely heavy" fat. When $N > 6$, a mean body mass is presented (bold-faced), and the range and sample size is given.

Species	Fat Level	Adult ♂	Adult ♀	Immature ♂	Immature ♀
White-eyed Vireo	no/light	11.1	11.2		
	mod/heavy	(9.1-13.1, N = 27)	(10.9-13.5, N = 17)	10.0, 11.7, 12.0, 12.4	10.3, 11.1, 11.2
	vlv/ehv	10.8, 12.8	10.8, 11.0, 11.5, 11.7, 13	14	11.5
Bell's Vireo	no/light		9.0, 9.0	14.7, 14.8	18.5
	mod/heavy	10.7			
Blue-headed Vireo (all <i>V. s. solitarius</i>)	no/light		17.3	16.8	11.4
	mod/heavy	15.5, 15.6, 17.8	(15.6-20.8, N = 6)	(15.6-20.8, N = 18)	16.2
			18.2	17.3	(14.7-19.5, N = 11)
Plumbeous Vireo	no/light	16.4, 16.5, 17.2	(16.5-20.5, N = 6)	(16.4-20.0, N = 6)	14, 15.3
Yellow-throated Vireo	no/light		16.8, 17.5		14.0
	mod/heavy	15.5, 15.6, 16.0, 17.3	17.5, 17.0, 17.6		
	vlv/ehv	15.7, 18.7	23.3		
			22.5		
Warbling Vireo (all <i>V. g. gilvus</i>)	no/light	12.3			
	mod/heavy	13.9	13.0, 14.9, 17.2	17.1	15.5, 15.7
	vlv/ehv	14.5		17.3	

Appendix. Continued

Species	Fat Level	Adult ♂	Adult ♀	Immature ♂	Immature ♀
Philadelphia Vireo	no/light	11.2	10.9 (8.4-13.2, N=6)		
	mod/heavy	10, 11.4, 12.5, 13, 15.3	11.0, 14.2, 15.3	12.9	12.2, 13.5, 13.8, 14.4, 14.8
	vhv/ehv	12.3	13.4, 14.7	16.7	17.5
Red-eyed Vireo	no/light	15.5 (12.5-17.9, N=19)	15.5 (12.9-19.0, N=19)	15.5	
	mod/heavy	18.3 (15.0-23.3, N=18)	17.1 (14.0-24.7, N=24)	17.2, 21.2, 26.3	15.4
	vhv/ehv		23.8	22.6	17.0, 23.3, 23.7, 24.5
Yellow-green Vireo	no/light	16.2			
Black-whiskered Vireo	no/light	16.5, 17.8	11.6		
	mod/heavy	23.9	20.2		

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