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NOTES ON THE GENUS HESPERIA IN TEXAS: TEMPORAL AND SPATIAL RELATIONSHIPS[1]

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As part of an ongoing, comprehensive study of the genus *Hesperia*, a concerted effort has been directed toward defining the distributional and biologic aspects of the members of the genus in Texas. This has resulted in significant new observations including identification of larval host plants, rearing of immature stages, discovery of populations of several species heretofore considered rare in the state, new distributional records, and the impending description of a new member of the *Hesperia* complex. It is the purpose of this paper to present spatial and temporal data on the eight *Hesperia* species which conclusively occur in Texas; further information on life history and habits will be presented elsewhere as part of specific reviews on individual species and complexes. Preliminary oviposition substrate and larval hostplant data have been published recently (McGuire, 1982).

All records herein presented are taken from specimens examined by the author or by known reliable authorities. Nomenclature for *Hesperia* larval foodplants, all of which are grasses, is based on Gould, 1975. Specimen citations include the collector's name followed by an abbreviation for the depository; abbreviations are as follows:

AME, Allyn Museum of Entomology, Sarasota, Florida; **AMNH,** American Museum of Natural History, New York; **CAS,** California Academy of Sciences, San Francisco, California; **MCZ,** Museum of Comparative Zoology, Cambridge, Massachusetts; **CIS,** California Insect Survey, University of California, Berkeley; **CNC,** Canadian National Collection, Science Service, Ottawa, Ontario, Canada; **CM,** Carnegie Museum of Natural History, Pittsburgh, Pennsylvania; **LACM,** Los Angeles County Museum, Los Angeles, California; **USNMNH,** (United States) National Museum of Natural History, Washington, D.C.; **RAB,** R.A. Bailowitz, Nogales, Arizona; **CDM,** C.D. MacNeill, Berkeley, California; **RLL,** Robert L. Langston, Kensington, California; **WWMc,** William W. McGuire, Colorado Springs, Colorado; **DLL,** Dan L. Lindsley, La Jolla, California; **MAF,** Mike A. Fisher, Littleton, Colorado; **JAS,** James A. Scott, Lakewood, Colorado; **RES,** Ray E. Stanford, Denver, Colorado; **DSB,** Daniel S. Burris, Tampa,

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Florida; **MT**, Mike Toliver, Urbana, Illinois; **S & T**, Don B. Stallings, Caldwell, Kansas; **JP**, Jim Parkinson, Kingsford, Michigan; **JRH**, J. Richard Heitzman, Independence, Missouri; **DA**, David Allen, Fort Worth, Texas; **CB**, Charles Bordelon, Longview, Texas; **CJD**, Chris J. Durden, Austin, Texas; **HAF**, Hugh A. Freeman, Garland, Texas; **FH**, Frank Hedges, Houston, Texas; **REH**, Richard E. Howard, Amarillo, Texas; **ROK**, Roy O. Kendall, San Antonio, Texas; **EK**, Edward Knudson, Bellaire, Texas, **MR**, Mike Rickard, Bellaire, Texas; **JV**, John Vernon, Novato, California; **FK**, Faye Karpuleon, Eau Claire, Wisconsin.

For the purpose of this paper, vegetational areas are referred to in rather general terms based on Gould's characterizations and terminology (Gould, 1962 and 1975); the map and legend depicted in Figure 1 demonstrates the basic vegetational areas and is reproduced from Gould, 1962, by permission of the author. Readers are referred to this work and Gould, 1975, for indepth discussion of these vegetational areas.

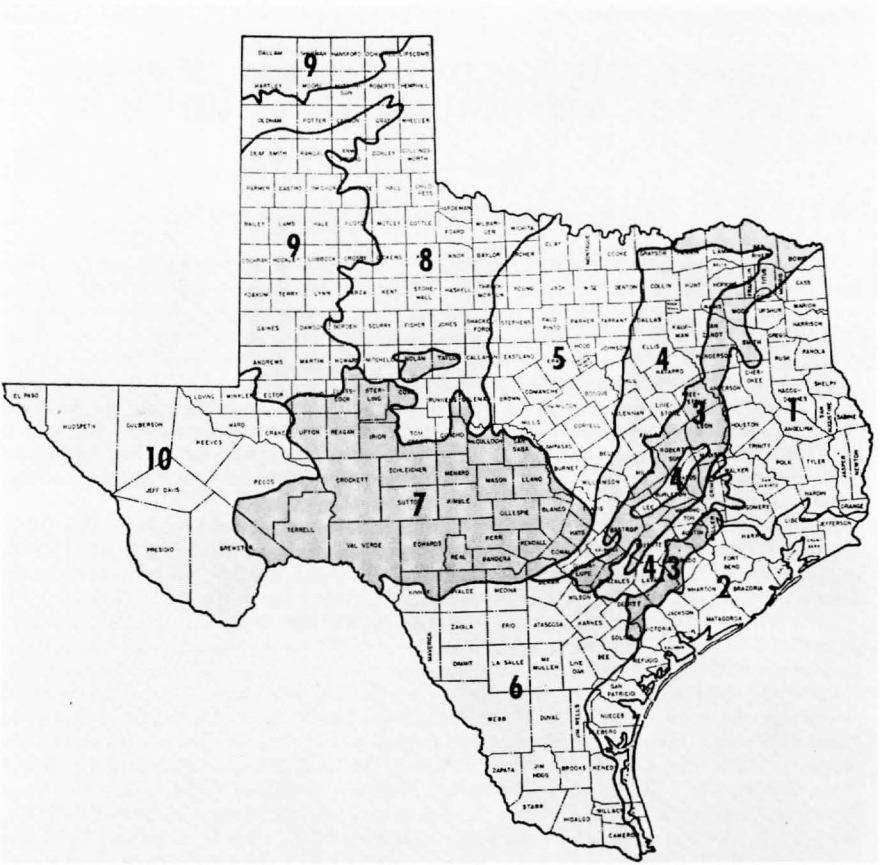
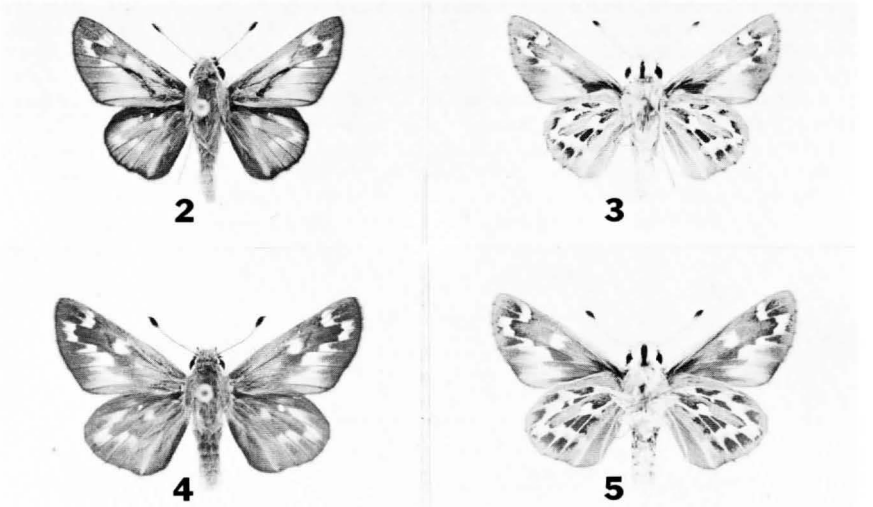


Figure 1: Vegetational areas of Texas (from Gould, 1962). 1, Pineywoods; 2, Gulf Prairies and Marshes; 3, Post Oak Savannah; 4, Blackland Prairies; 5, Cross Timbers and Prairies; 6, South Texas Plains; 7, Edwards Plateau; 8, Rolling Plains; 9, High Plains; 10, Trans-Pecos, Mountains and Basins.

Hesperia uncas uncas Edwards
Figures 2, 3 (♂), 4, 5 (♀),6 (temporal distribution), 7 (distribution)

Largely because of a paucity of collecting efforts in suitable habitats for *Hesperia uncas* in Texas, distributional records for the species are relatively few, and much is yet to be learned about its range in the state as well as its biological requirements. Based on current knowledge, the largest populations of *uncas* exist in the Texas panhandle, occurring in the Rolling Plains and High Plains vegetation communities; in addition, populations of *uncas* are still to be found in the Trans-Pecos area, specifically the Hueco, Sierra Diablo, and the Davis Mountain ranges. This species typically occupies more open range habitats where adults are frequently noted visiting nectar sources, especially *Cirsium*. To date, no definite larval host plant has been identified for the species in Texas, although *Bouteloua gracilis* (Humboldt, Bonpland, Kunth) Lagasca



Figures 2-5: *Hesperia uncas uncas* Edwards. 2-3, male upper (2) and under (3) surfaces; TEXAS. Hudspeth Co.: 5 mi. W. Victoria Canyon, 5700 ft., Sierra Diablo Mtns., *ex ova* 29-XI-75 (Allyn Museum photos 090479-9/10). 4-5, female upper (4) and under (5) surfaces; same locality, *ex ova* 31-XII-75 (Allyn Museum photos 090479-7/8). All specimens in the collection of W.W. McGuire.

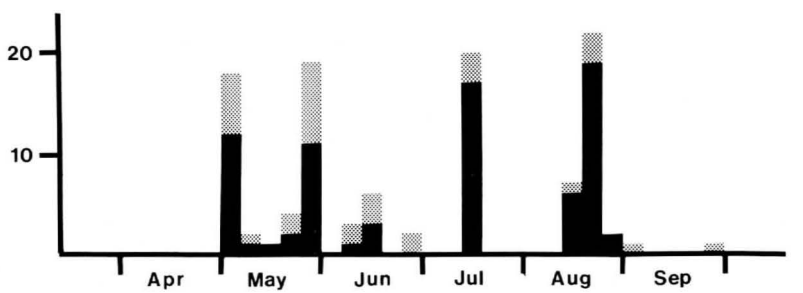


Figure 6: Temporal distribution (based on material examined) of wildcaught adults of *Hesperia u. uncas* in Texas. Males represented by black bars, females by stippled bars.

ex. Steuder is utilized by adults in some areas of the state as oviposition substrate (McGuire, 1982). Immatures have been successfully reared from ova on *Cynodon dactylon* (Linnaeus) Persoon in the laboratory by this author.

Texas populations of *H. uncas* correspond favorably to nomenotypic *uncas*, although they are slightly larger; as one proceeds south into Mexico, a considerably smaller and darker unnamed population exists. Notes and description of this latter population are soon to be published. For the time being, however, and until further definition of the interrelationships of various *uncas* populations can be ascertained, Texas specimens are best placed as typical *H. uncas uncas*. Seventy six male and 33 female examples from Texas have been examined and are recorded below.

ARMSTRONG CO.: South of Claude, Palo Duro Canyon, 2 ♂, 1-V-72 (James A. Scott, WWMc). CARSON CO.: White Deer, 2 ♂, 23-VIII-42, ♂, ♀, 23-V-43 (all H.A. Freeman, AMNH), ♂, ♀, 25-V-43 (H.A. Freeman, CNC), ♂, 23-V-43, 2 ♂, 30-VIII-41, ♀, 4-IX-41, ♀, 27-IX-42 (all H.A. Freeman, WWMc); 20 mi. N. White Deer, 3 ♂, 18-VIII-41, 3 ♂, ♀, 21-VIII-41, ♂, 17-C-42 (all H.A. Freeman, HAF). DALLAM CO.: 2 mi. E. Texline, ♂, 13-VII-75 (John Vernon, JV); 17 mi. S.E. Texline, 2 ♂, 3 ♀, 13-VII-75 (John Vernon, JV), 4 ♂, 13-VII-75 (John Vernon, WWMc), 2 ♂, 13-VII-75 (Mike A Rickard, WWMc). DEAF SMITH CO.: nr. Dawn, ♂, 17-VII-77 (R.O. and C.A. Kendall, ROK). GRAY CO.: Pampa, 9 ♂, 5 ♀, 31-V-42 (Stallings & Turner). HUDSPETH CO.: 6 mi. W. Victoria Canyon, 5200 ft., Sierra Diablo Mtns., 2 ♂, 23-VIII-75 (W.W. McGuire, ROK), 15 ♂, 3 ♀,

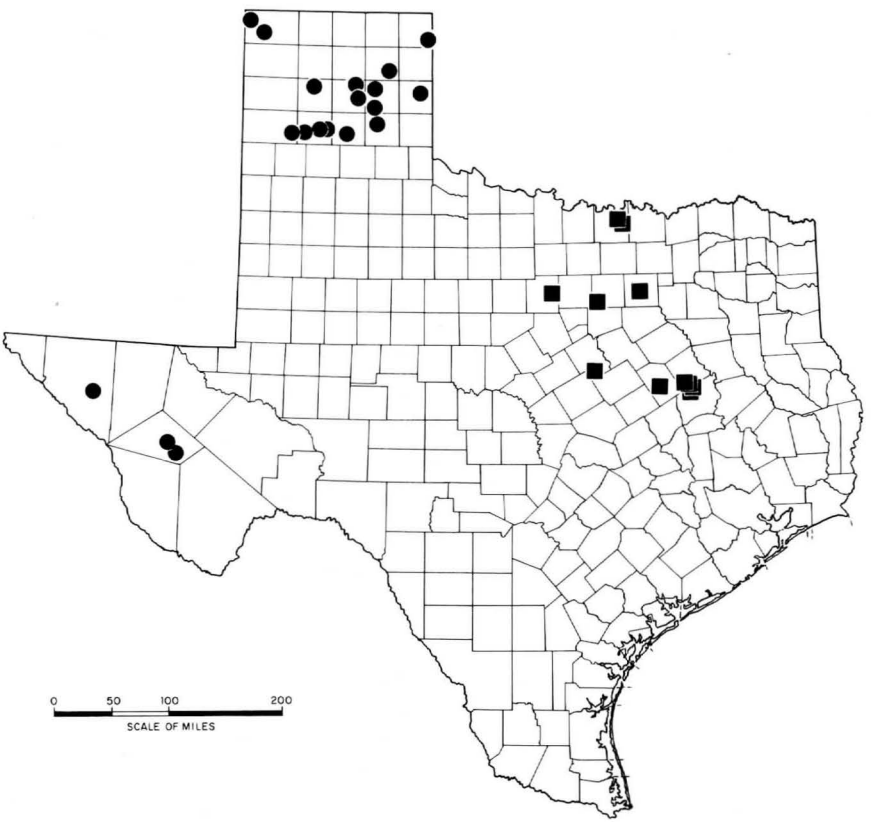
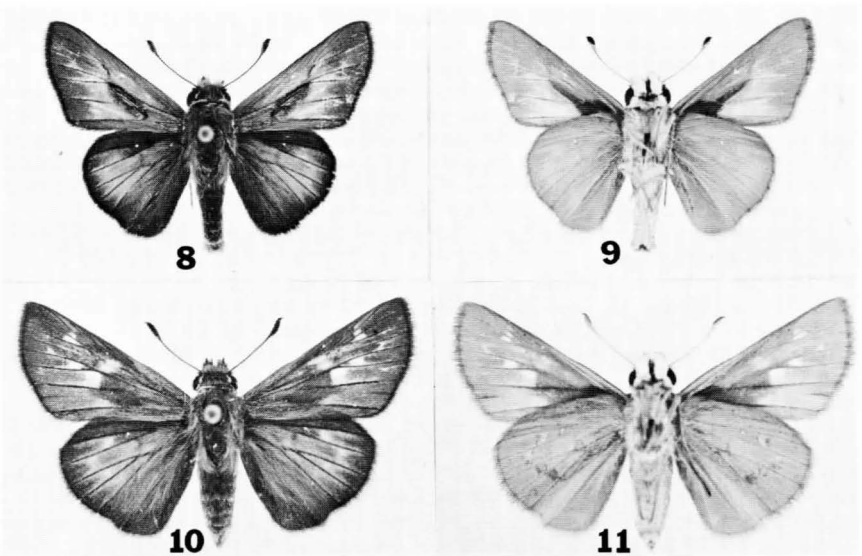


Figure 7: Distribution in Texas of *Hesperia u. uncas*, closed circles, and *Hesperia attalus attalus*, closed squares.

23-VIII-75 (W.W.McGuire, WWMc), *ex ova* ♂, 29-XI-75, *ex ova* ♀, 3-XIII-75, *ex ova*, ♂, 5-XII-75, *ex ova* ♀, 29-XII-75, *ex ova* ♀, 31-XII-75 (all W.W. McGuire, WWMc). JEFF DAVIS CO.: Ft. Davis, 2♀, 9-VI-49, H.A. Freeman, HAF); Mt. Locke, Davis Mtns., 6♂, 4♀, 2-V-59, 2♂, 2♀, 3-V-59, 2♂, 4-V-59 (all J.M. and S.N. Burns, JMB). LIPSCOMB CO.: Higgins, ♀, 25-V-?, ♀, 31-V-?, 3♂, 3♀, 13-V-? (CAS). POTTER CO.: 28 mi. S. Dumas, ♂, 2-V-72 (J.A. Scott, JAS). RANDALL CO.: Palo Duro Canyon, ♂, 9-V-42, ♀, 10-V-42 (All AMNH), ♂, 11-V-43 (D.B. Stallings, PSR), ♂, 28-V-77 (Richard E. Howard, WWMc), 2♀, 28-VI-77 (Richard E. Howard, REH); Palo Duro Canyon State Park, ♀, 18-V-75 (Ray E. Stanford, RES), Hwy. 217, 4 mi. E. Canyon, 4♂, 15-VIII-77, 2♂, 16-VII-77 (all R.O. and C.A. Kendall, ROK); Buffalo Lake National Wildlife Refuge, ♂, 17-VII-77 (R.O. and C.A. Kendall, ROK).

Hesperia woodgatei (Williams)
Figure 18 (distribution)

A distinct population of *Hesperia woodgatei* occurs on the eastern edge of the Balcones Escarpment in Travis County, with a few specimens having been taken farther onto the Edwards Plateau in the vicinity of Kerrville. At present, it is difficult to define any further distribution for the insect in Texas, although it is reasonable to suspect that nominate *woodgatei* may be resident in the Upper Austral life zone of the Chisos and Davis Mountains in West Texas since it is found in adjacent New Mexico. Detailed observations, immature and adult descriptions, and biology of the Texas population will be presented in a separate, comprehensive paper on the *H. woodgatei* complex.



Figures 8-11: *Hesperia ottoe* Edwards. 8-9, male upper (8) and under (9) surfaces; TEXAS. Hemphill Co.; Hwy. 33, 20 mi. E. Canadian, 31-V-77 (Allyn Museum photos 090379-15/16). 10-11, Female upper (10) and under (11) surfaces; same data (Allyn Museum photos 090379-3/4).

Hesperia ottoe Edwards
Figures 8, 9, (♂), 10, 11 (♀), 12 (distribution)

Only a few records exist for *H. ottoe* in Texas, and all are limited to small sections of virgin grasslands in the extreme northeast section of the panhandle. This area, in the general vicinity of the Canadian River breaks, is relatively inaccessible to collectors so a true analysis of distribution and density is difficult, but suitable habitat for *ottoe* is present in this section of the state. This vegetational area is the western extreme of a stratum that extends east and northeast through Oklahoma and Kansas where large populations of *ottoe* are still well established; it is, in effect, part of the Great Plains. *Hesperia ottoe* is single brooded, with emergence generally in early June and occurring later as one moves farther north. Considerable life history information is now available and will be presented elsewhere. Substantiated Texas records, all recent, are recorded below. A single report of *ottoe* in Texas is recorded for Mulberry Creek, Lipscomb County, in 1876 *leg.* Thomas M. Woodruff (Woodruff, 1877), but these specimens have not been located for examination and are accordingly not plotted herein; however, it is reasonable to expect that they are valid records. HEMPHILL CO.: Hwy. 33, ca. 20 mi. E. Canadian, 14 ♂, 2 ♀, 31-V-77 (W.W. McGuire, WWMc); 5 mi. S. Dew, ♂, 2-VII-78 (E. Knudson, EK); Lake Marvin, ♀, 3-VII-78 (E. Knudson, EK). WHEELER CO.: 5 mi. W. Wheeler, ♀, 3-VII-78 (F. Hedges, FH).

Hesperia pahaska williamsi Lindsey
Figures 13, 14 (♂), 15, 16 (♀), 17 (temporal distribution), 18 (distribution)

The Texas populations of *Hesperia pahaska* traditionally have been grouped under *williamsi*, since Texas specimens were included in the original description of *williamsi* (Lindsey, 1940). Extensive work has been conducted in ascertaining the biological requirements of *Hesperia pahaska* in Texas, its full distribution, and comparative characteristics with other *pahaska* populations. To date, this work has been able to fairly well define the distribution of *pahaska* in western Texas, where it is locally abundant in the Trans-Pecos Mountain area extending west from Sanderson, in Pecos County, and into the Big Bend and Davis Mountain areas. Scattered populations exist in the vicinity of the Sierra Diablo and Guadalupe Mountain ranges. The species is double brooded in Texas, with peak flights occurring in May and again in September, although occasional specimens are to be found during all summer months.

Precise distributional records from 280 male and 133 female specimens are as follows: BREWSTER CO.: Alpine, ♂, ♀, (AMNH), ♂, VII-15, 2 ♂, 4-X-30 (all AMNH), ♂, 8-III-26 (O.C. Poling, AMNH), ♀, 7-VI-27 (P.G. Englehardt, AMNH), ♀, 31-X-33 (AMNH); nr. Alpine, ♂, 10-IX-26 (Poling, LACM); Sunny Glen Ranch, Alpine, ♂, 1-VI-15, 2 ♂, 15-IV-30 (all AMNH); 6 mi. N. Study Butte, ♂, 17-IX-71 (R.O. and C.A. Kendall, ROK); Panther Pass, BBNP, ♀, 21-IX-71 (R.O. and C.A. Kendall, ROK); Panther Canyon, BBNP, ♂, 19-V-73 (R.O. and C.A. Kendall, ROK); Green Gulch, 5400 ft., Chisos Mtns., ♂, 18-V-73 (W.W. McGuire, WWMc); Green Gulch, 6000 ft., Chisos Mtns., ♀, 27-IV-73 (J.A. Scott, JAS); US 90, 35 mi. W. Sanderson, 5 ♂, 7 ♀, 20-V-73, 5 ♂, 3 ♀, 8-VI-74, 2 ♂, ♀, 9-VI-74 (all W.W. McGuire, WWMc); US 90, 32 mi. W. Sanderson, ♀, 8-VI-74, ♂, ♀, 9-VI-74 (all W.W. McGuire, WWMc); US 90, 30 mi. W. Sanderson, ♀, 8-VI-74 (W.W. McGuire, WWMc); US 90, 38 mi. W. Sanderson, 10 ♂, 2 ♀, 30-IV-77, 53 ♂, 6 ♀, 2-V-77 (all W.W. McGuire, WWMc); 38-39.5 mi. W. Sanderson, 41 ♂, 4 ♀, 1-V-77 (W.W. McGuire, WWMc); US 90, 9 mi. W. Marathon, ♂, 11-IX-76 (W.W. McGuire, WWMc); US 90, 4 mi. N. Marathon, ♂, 11-IX-76 (W.W. McGuire, WWMc); US 90, 24 mi. E. Marathon, ♂, 2 ♀, 11-IX-76 (W.W. McGuire, WWMc); US 90, 27 mi. E. Marathon, ♂, ♀, 11-IX-76 (W.W. McGuire, WWMc); US 90, 16 mi. E. Marathon, ♂, 23-VII-75 (John P. Shean, WWMc); 10 mi. S. Marathon, ♂, 10-VIII-67 (J.A. Scott, JAS); 10 mi. W. Alpine, 2 ♂, 25-IX-69, 2 ♂, 22-IV-72 (All J.A. Scott, JAS); 21 mi. S. Alpine, 7 ♂, 20-IX-70 (J.A. Scott, JAS); Marathon, 2 ♂, 3 ♀, 15-V-77 (E. Knudson, EK); 10 mi. E. Marathon, ♂, 2 ♀, 15-V-77 (E.C. Knudson, WWMc); US 90, ca. 10

mi. W. Alpine, 2♂, ♀, 29-VIII-77 (W.W. McGuire, WWMc); US 90, 14 mi. E. Marathon, ♂ *ex ova*, 1-VII-77, ♂*ex ova*, 2-VII-77, ♂*ex ova*, 5-VII-77, ♂*ex ova*, 7-VII-77, 2♂*ex ova*, 10-VII-77, 2♂*ex ova*, 11-VII-77, ♂*ex ova*, 12-VII-77, 2♂*ex ova*, 14-VII-77, ♀*ex ova*, 17-VII-77, ♀*ex ova*, 18-VII-77, ♀*ex ova*, 21-VII-77, 2♀*ex ova*, 23-VII-77, ♀*ex ova*, 26-VII-77, ♂*ex ova*, 27-VII-77, ♀*ex ova*, 28-VII-77, ♀*ex ova*, 29-VII-77, ♀*ex ova*, 30-VII-77 (all W.W. McGuire, WWMc). CULBERSON CO.: 13 mi. S. and 10 mi. E. Van Horn, ♂, 11-V-73 (Jack Harry, WWMc); roadside park, ca. 3 mi. W. Van Horn, ♂, 1-IX-75 (E. Knudson, EK), ♂, 1-IX-75 (E. Knudson, WWMc). JEFF DAVIS CO.: Ft. Davis, ♂, 3♀, 1-V-15 (AMNH), ♂, 3-V-39 (LACM) ♂, 29-V-48 (O. Buckholz, AMNH); Rockpile Park, Davis Mtns., 2♀, 13-VI-60 (R.O. and C.A. Kendall, ROK); Wild Rose Pass, Davis Mtns., ♀, 21-VI-63 (H.W. Tilden, JWT); Limpia Cnyn., 3♂, 3♀, 6-X-63 (J.W. Tilden, JWT); Scenic Loop, Davis Mtns., ♂, 19-X-73 (R.O. and C.A. Kendall, ROK); Davis Mtns., Limpia Cnyn., 4800 ft., 1 mi. N. Ft. Davis, ♀, 28-IV-59 (J.M. and S.N. Burns, JMB); 4 mi. W.N.W. Ft. Davis, 5000 ft., 2♂, 28-IV-59 (J.M. and S.N. Burns, JMB); 6.5 mi. NE Sawtooth Mt., 5600 ft., 2♀, 28-IV-59, 17♂, 3♀, 29-IV-59, 2♀, 3-V-59 (all J.M. and S.N. Burns, JMB); H.O. Cnyn., 6000 ft., 3♂, 2♀, 29-IV-59, 19♂, 6♀, 30-IV-59, 7♂, 1-V-59, 3♂, 3-V-59 (all J.M. and S.N. Burns, JMB); Limpia Cnyn., 4 mi. W.N.W. Ft. Davis, 5000 ft., ♂, 2♀, 1-V-59 (J.M. and S.N. Burns, JMB); Limpia

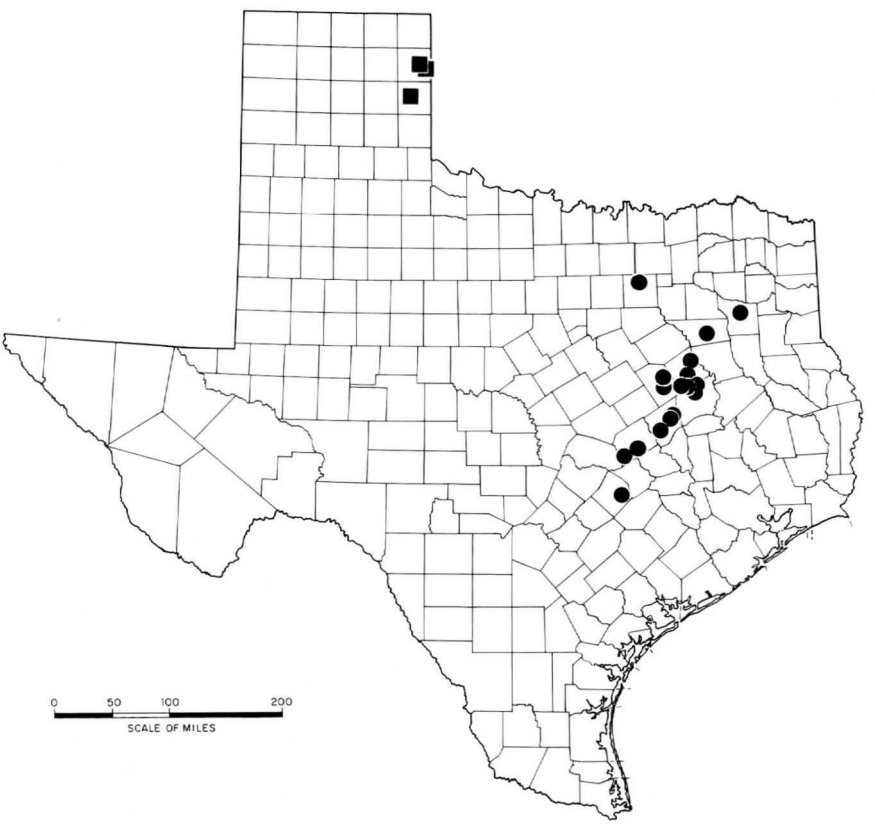
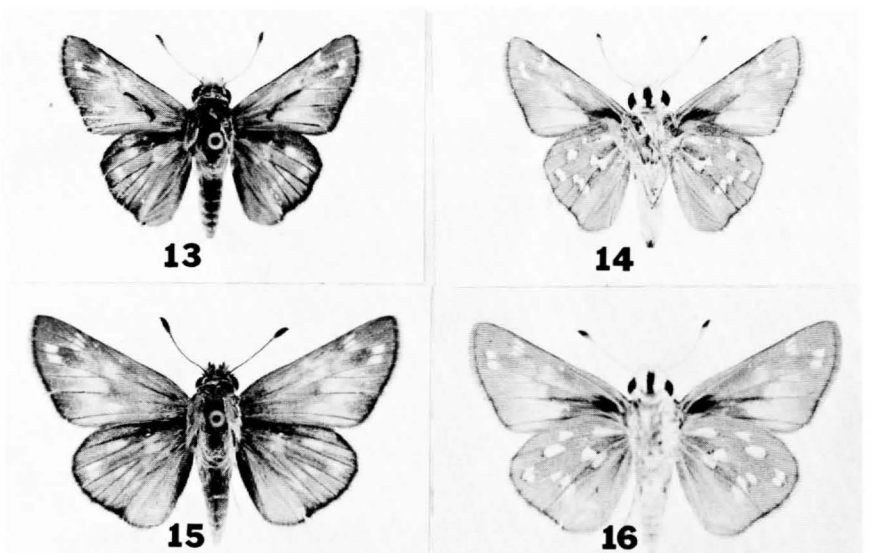


Figure 12: Distribution in Texas of *Hesperia ottoe*, closed squares, and *Hesperia meskei*, closed circles.

Cnyn, 4700 ft., 3♂, 4-V-59 (J.M. and S.N. Burns, JMB); Mt. Locke, 6300-6791 ft., 6♂, 3♀, 2-V-59, 4♂, ♀, 3-V-59, 2♂, 4-V-59 (all J.M. and S.N. Burns, JMB); Davis Mtns., ♂, 30-VII-53, ♂, 5-VII-62 (all H.A. Freeman, WWMc), 2♀, 27-V-73, ♂, ♀, 30-V-73 (all W.W. McGuire, WWMc), 2♂, 31-VIII-73 (Jack Harry, WWMc); 6 mi. W. Mt. Livermore, Davis Mtns., ♂, 17-V-73 (Jack Harry, WWMc); Davis Mtns., 22 mi. N. Ft. Davis. 2♀, 27-V-73 (W.W. McGuire, WWMc); Davis Mtns., 5 mi. N. Ft. Davis, ♂, 30-V-73 (W.W. McGuire, WWMc); Nunn Hill, Davis Mtns., ♂, 26-IX-69 (J.A. Scott, JAS), 2♂, 28-VIII-77 (W.W. McGuire, WWMc); Mt. Locke, ♂, ♀, 21-IX-70 (J.A. Scott, JAS); nr. Mt. Locke, Davis Mtns., 4♂, 24-VIII-75 (W.W. McGuire, WWMc); W. base Sawtooth Mtn., Davis Mtns., ♀, 31-VIII-73 (Jack Harry, WWMc); 10 mi. S. Kent, Hwy. 118, ♂, 22-VIII-75 (John P. Shean, WWMc); 15 mi. W. Ft. Davis, 2♂, 31-VIII-75 (E. Knudson, EK); 18 mi. W. Ft. Davis, 4♂, 31-VIII-75 (E.C. Knudson, WWMc), 9♂, 1-IX-75 (M.A. Rickard, WWMc); Fisher Hill, Davis Mtns., 6141 ft., 33♂, 17♀, 24-VIII-75, ♀*ex ova*, 8-XII-75, 10♂, 19♀, 28-VIII-77 (all W.W. McGuire, WWMc), 7♂, 2♀, 28-VIII-77 (E.C. Knudson, WWMc); Loop 118, 2♂, 4-VII-76 (E.C. Knudson, WWMc), 3♂, 4-VII-76 (E. Knudson, EK); Elbow Creek Cnyn., Davis Mtns., 5♂, ♀, 28-VIII-77 (W.W. McGuire, WWMc); Davis Mtns., 20 mi. W. Ft. Davis, 2♂, ♀, 28-VIII-77 (W.W. McGuire, WWMc); Davis Mtns., 24 mi. W. Ft. Davis, ♂, 4♀, 28-VIII-77 (W.W. McGuire, WWMc), 2♂, 28-VIII-77 (E. Knudson, WWMc); Davis Mtns., 10 mi. N. Ft. Davis, ♂, 28-VIII-77 (W.W. McGuire, WWMc). PECOS CO.: 32 mi. E. Marathon, US 90, ♂, 11-IX-76 (W.W. McGuire, WWMc); 20 mi. W. Sanderson, US 90, 6♂, 4♀, 20-V-73, 2♀, 9-VI-73, ♂, ♀, 27-V-73, ♂, ♀, 8-VI-74 (all W.W. McGuire, WWMc); US 90, 26.8 mi. W. Sanderson, 16♂, 6♀, 30-IV-77 (W.W. McGuire, WWMc). PRESIDIO CO.: Shafter, ♂, 9-VI-61 (H.A. Freeman, HAF); 3 mi. N. Shafter, ♂, 29-V-73 (W.W. McGuire, WWMc); Elephant Mtn., 3000 ft., 5♂, 1-VI-46 (Stallings & Turner, S & T).



Figures 13-16: *Hesperia pahaska williamsi* Lindsey. 13-14, male upper (13) and under (14) surfaces; TEXAS. Brewster Co.: U.S. 90, ca. 35 mi. W. Sanderson, 8-VI-74 (Allyn Museum photos 090379-13/14). 15-16, female upper (15) and under (16) surfaces; TEXAS. Brewster Co.: U.S. 90, ca. 32 mi. W. Sanderson, 9-IV-74 (Allyn Museum photos 090379-1/2).

Hesperia metea licinius (Edwards)
Figures 18 (distribution), 19, 20, (♂), 21, 22 (♀), 23 (temporal distribution)

This distinctive insect is well established in several habitats in Texas that support the larval host plant, *Schizachyrium scoparium* (Michaux) Nash (McGuire, 1982). Phenotypically large and quite dark, especially females which typically have a sooty ground color and are immaculate, *licinius* clearly represents the western extreme of the *H. metea* complex and has numerous characteristics to enforce its subspecific, or even specific, ranking (McGuire, William W. An analysis of *Hesperia metea* (Scudder): life history, comparative features, and distribution (in prep). *Hesperia horus* Edwards 1871, and *H. belfragei* H.A. Freeman 1944, both described from Texas, are synonyms of *licinius* (Edwards, 1871); as will be presented in the aforementioned review, there is ample reason to regard *licinius* as a valid subspecies and it is here so considered.

Hesperia metea licinius is to be found in dry, open glades among the piney woods in northeast Texas and in similar grassy openings in eastern portions of the Post Oak Savannah. A rather unusual habitat, harboring large *licinius* populations, is the open rolling grasslands in Tarrant County, a habitat occupied by *H. viridis* and *H. attalus attalus* later in the season. Throughout its range *licinius* is single brooded, the flight period extending from early March through mid-April. Temporal data follows for 176 male and 57 female specimens: CASS CO.: Lake Texarkana, 2♂, 10-IV-66, ♀, 11-IV-66 (all Faye Karpuleon, FK). DALLAS CO.: Cedar Hill, ♀, 6-IV-41, 2♂, 4-IV-42 (all H.A. Freeman, HAF), 2♀, ♂, 3-IV-49 (H.A. Freeman, WWMc), 4-IV-42 (H.A. Freeman, AMNH), ♂, 4-IV-42 (H.A. Freeman, S&T); Lancaster, ♀, 15-IV-49 (H.A. Freeman, HAF). FREESTONE CO.: Hwy. 164, 4 mi. N.W. Buffalo, ♂, 23-III-75 (W.W. McGuire, WWMc); Hwy. 164, 5 mi. N.W. of Buffalo, 2 ♂, 17-III-74, 4 ♂, 15-III-75, 4♂, 23-III-75

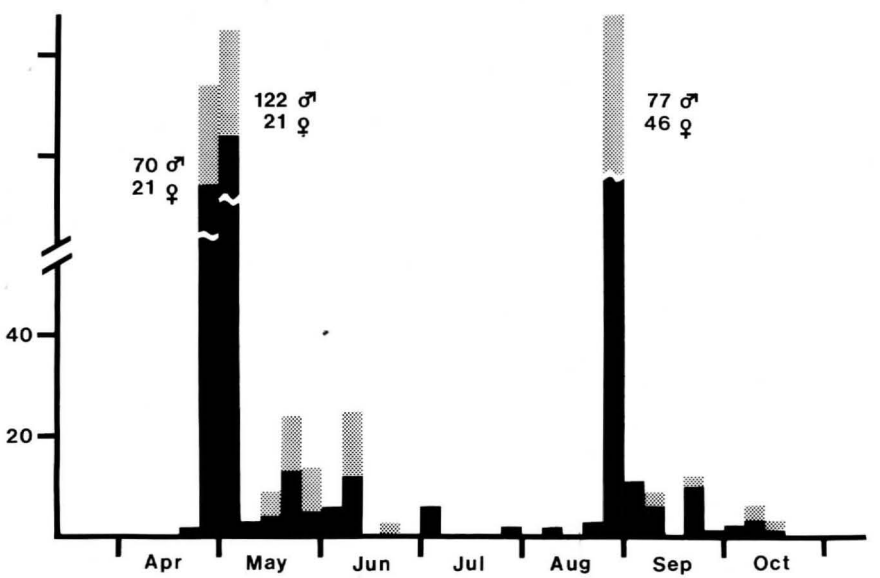


Figure 17: Temporal distribution (based on material examined) of wildcaught adults of *Hesperia pahaska williamsi* in Texas. Males represented by black bars, females by stippled bars.

(all W.W. McGuire, WWMc); ♀, 17-III-74 (E. Knudson, WWMc), 2 ♂, 2 ♀, 17-III-74 (E. Knudson, EK); Hwy. 164, 7 mi. N.W. Buffalo, 10 ♂, 9-III-74, ♀, 17-III-74, 10 ♂, 18-III-74 (all W.W. McGuire, WWMc); Hwy. 164, 8 mi. N.W. Buffalo, 2 ♂, 23-III-75 (W.W. McGuire, WWMc). HARRISON CO.: vic. Caddo Lake State Park, 3 ♂, 6-IV-64; ♂, 8-IV-73 (all R.O. and C.A. Kendall, ROK). JOHNSON CO.: Cleburne State Park, ♂, 24-III-51 (H.V. Daly, AMNH); Alvarado, 6 ♂, 2 ♀, 10-IV-77, (W.W. McGuire, WWMc). LEON CO.: 3 mi. E. Buffalo, 2 ♂, 23-III-75 (W.W. McGuire, WWMc). MORRIS CO.: Daingerfield State Park, 3 ♂, ♀, 6-IV-64 (R.O. and C.A. Kendall, ROK). SMITH CO.: Tyler, 3 ♂, 22-III-50 (H.A. Freeman, AMNH); Tyler State Park, 4 ♂, 22-III-50, ♂, 23-III-51 (LACM); ♂, 22-III-50, ♂, 23-III-51 (all H.A. Freeman, ROK); ♂, ♀, 22-III-50, 2 ♂, 24-III-59 (all H.A. Freeman, HAF); ♂, 23-III-51 (H.V. Daly, AMNH); ♂, 5-IV-59, ♀, 10-IV-60 (all H.A. Freeman, WWMc); 6 ♂, 6 ♀, 4-IV-64, 2 ♂, 25-III-73, ♂, 11-IV-73 (all R.O. and C.A. Kendall, ROK); ♂, 7-IV-65 (J.R. Heitzman, CDF); ♂, ♀, 18-III-72, 2 ♂, 2 ♀, no date (all J. Vernon, JV); 6 ♂, 2 ♀, 25-III-73, 23 ♂, 8 ♀, 1-IV-73, 5 ♂, ♀, 9-IV-77 (all W.W. McGuire, WWMc); 2 ♂, ♀, 11-IV-75, 3 ♂, 20-III-77 (all E. Knudson, EK); ♀, 12-IV-75 (E.Knudson, WWMc); ♀, 6-IV-75, ♂, 27-III-76 (all C. Bordelon, WWMc); 2 ♂, 19-III-77 (J. Vernon, WWMc). TARRANT CO.: Benbrook Reservoir,

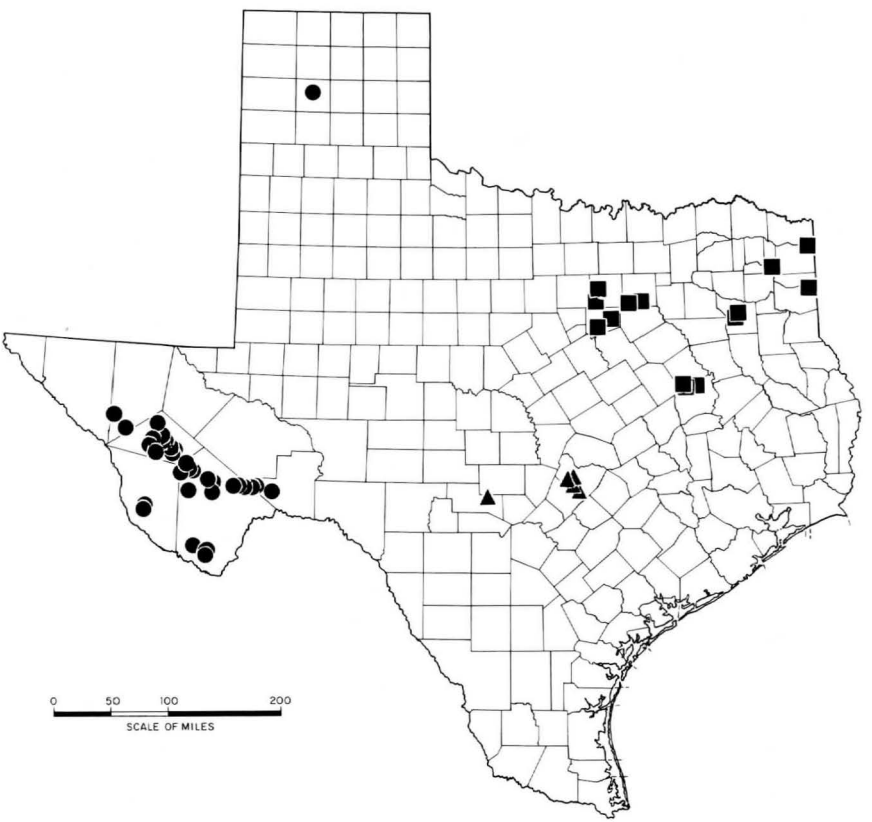


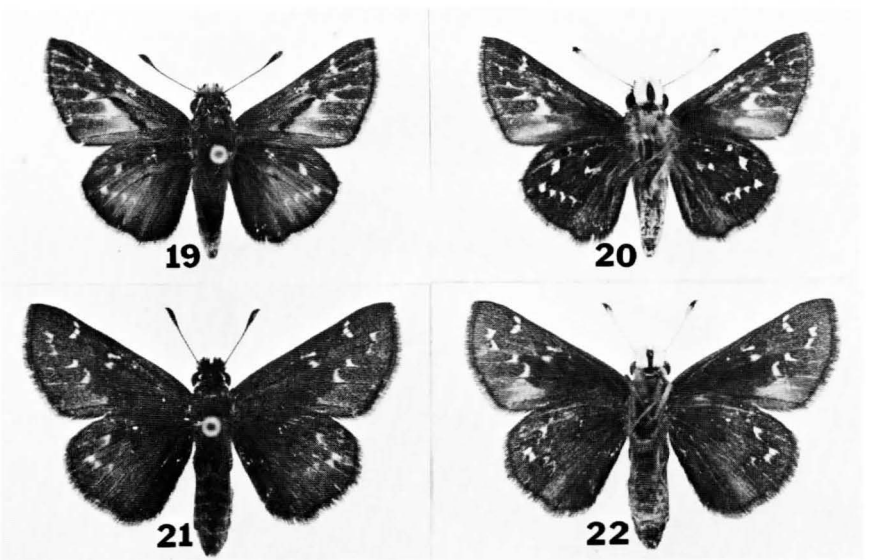
Figure 18: Distribution in Texas of *Hesperia pahaska williamsi,* closed circles, *Hesperia metea licinius,* closed squares, and *Hesperia woodgatei,* closed triangles.

Holiday Park, ♂, 1-IV-73, ♂, ♀, 7-IV-73 (all D.E. Allen, DEA); 3 ♂, 2 ♀, 7-IV-73 (M.A. Rickard, WWMc); ♂, 3 ♀, 4-IV-77 (D.E. Allen, WWMc); 34 ♂, 11 ♀, 8-IV-77, 4 ♂, 7 ♀, 10-IV-77 (all W.W. McGuire, WWMc); Fort Worth, Lake Worth City Park, ♂, 2 ♀, 8-IV-64 (R.O. and C.A. Kendall, ROK).

Hesperia viridis (Edwards)

(Figures 24, 25 (♂), 26, 27 (♀), 28 (temporal distribution), 29 (distribution)

Distributed over a rather wide area of the southwest including eastern Arizona, New Mexico, Colorado, southwestern Nebraska, western Kansas, Oklahoma, and northeastern Mexico, *H. viridis* reaches its greatest density in Texas. It is the most widely occurring and prevalent of the *Hesperia* in the state. The distribution in Texas includes the majority of the area extending north and west from the Balcones Escarpment, thus encompassing several biotic communities: the Edwards Plateau, the Cross Timbers and Prairies, the Rolling Plains, the High Plains, and segments of the Trans-Pecos area. Throughout this range *viridis* is doubly brooded, with the fall flight being of greatest magnitude. Along the Balcones Escarpment in Travis County *viridis* is sympatric to some degree with *H. woodgatei* (Williams), in the Trans-Pecos with *H. pahaska williamsi*, in Tarrant and Palo Pinto counties (part of the Cross Timbers and Prairies vegeta-



Figures 19-22: *Hesperia metea licinius* (Edwards). 19-20, male upper (19) and under (20) surfaces; TEXAS. Freestone Co.: Texas Hwy. 164, 5.0 mi. W. Buffalo, 23-III-75 (Allyn Museum photos 090379-17/18). 21-22, female upper (21) and under (22) surfaces; TEXAS. Smith Co.: Tyler State Park, 25-III-73 (Allyn Museum photos 090379-5/6).

tional area) with *H. attalus attalus* (Edwards) and in the High Plains with *H. uncas uncas* and *H. ottoe*. Adults are frequent flower visitors with preferred nectar sources being *Asclepias* in the spring and *Cirsium, Liatris* and yellow composites in the fall. The larval foodplant, recorded by this author for *viridis* is *Erioneuron pilosum* (Buckley) Nash (McGuire, 1982). Specific life history data, including larval descriptions and comparative parameters between populations, will be reported elsewhere (McGuire, William W.: Life history and distributional notes on *Hesperia viridis* (Edwards). In prep).

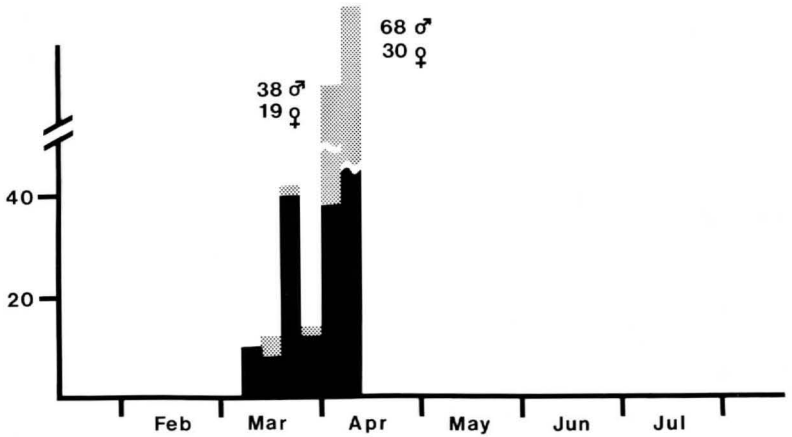
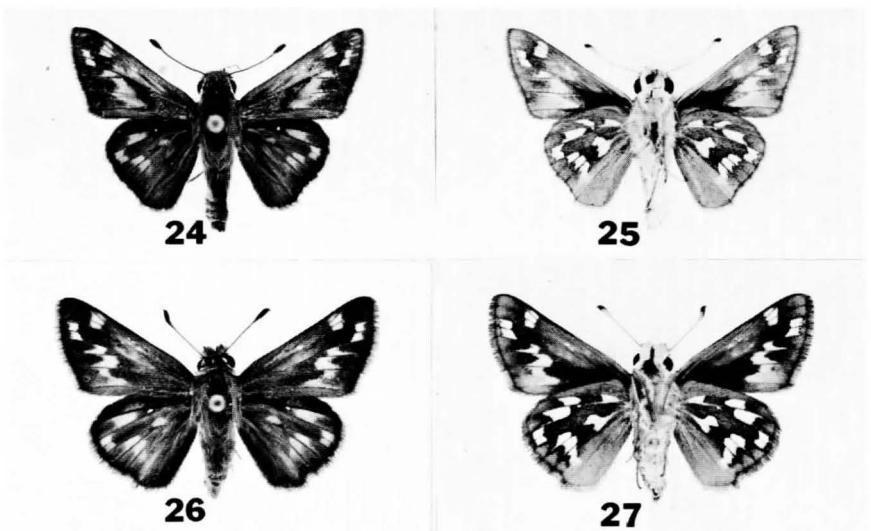


Figure 23: Temporal distribution (based on material examined) of wildcaught adults of *Hesperia metea licinius* in Texas. Males represented by black bars, females by stippled bars.



Figures 24-27: *Hesperia viridis* (Edwards). 24-25, male upper (24) and under (25) surfaces; TEXAS. Bexar Co.: Loop 1604 & Camp Bullis Road, 25-IV-76 (Allyn Museum photos 090479-5/6). 26-27, female upper (26) and under (27) surfaces; same locality, 22-IV-77 (Allyn Museum photos 090379-11/12).

Confirmed distributional records for Texas are reported, based on 645 male and 465 female specimens examined:
WEST TEXAS: ♂, 30-IV-? (CAS); Mt. Horne, ♀, (CAS). ARMSTRONG CO.: Palo Duro Cnyn., 18.6 mi. S. Claude, 3 ♂, 1-V-72, 10 ♂, ♀, 2-V-72 (all J.A. Scott, JAS), 3 ♂, 1-V-72 (J.A. Scott, WWMc); Palo Duro C., ♂, 2 ♀, 9-V-42, 7 ♀, 1-VI-42 (Stallings & Turner). BANDERA CO.: Bandera, ♀, 23-IV-66 (R.O. and C.A. Kendall, ROK); F.M. 2107, ♀, 24-IV-66 (R.O. and C.A. Kendall, ROK); Tex. Hwy. 16, 2.7 mi. N.W. of S.E. Co. line, ♂, ♀, 24-IV-66 (R.O. and C.A. Kendall, ROK); Tex. Hwy. 16, nr. Medina, 2 ♂, 29-IV-66 (R.O. and C.A. Kendall, ROK); Tex. Hwy. 16, roadside park nr. S.E. Co. line, 4 ♂, ♀, 15-IV-67 (R.O. and C.A. Kendall, ROK); Tex. Hwy. 470, between Utopia and Tarpley, ♀, 9-IX-67 (R.O. and C.A. Kendall, ROK); Tex. Hwy. 140, ♀, 9-IX-67 (R.O. and C.A. Kendall, ROK); F.M. 467, 2 ♂, 5-V-68 (M. Rickard, WWMc); Tarpley, 4 ♂, 2 ♀, 24-IV-75 (John Vernon, JV); Hwy. 16, Pipe Creek, 3 ♀, 28-IX-75 (W.W. McGuire, WWMc); Hwy. 16, 8 mi. S.E. Pipe Creek, 13 ♂, 6 ♀, 17-IV-77 (W.W. McGuire, WWMc); Hwy. 16, 3 mi. W. Pipe Creek, 11 ♂, 3 ♀, 17-IV-77 (W.W. McGuire, WWMc); F.M. 462, 6 mi. S. Tarpley, 14 ♂, 5 ♀, 17-IV-77 (W.W. McGuire, WWMc). BAYLOR CO.: 7.4 mi. S. Seymour, 2 ♂, 30-IV-72, ♂, 2 ♀, 1-V-72 (J.A. Scott, WWMc), 2 ♂, 30-IV-72 (J.A. Scott, WWMc); Lake Kemp, Seymour, ♂, 2 ♀, 29-V-76 (E. Knudson, WWMc), ♂, 3 ♀, 29-V-76 (E. Knudson, EK). BELL CO.: 6 mi. N. Killeen, N.W. Corner Belton Lake, 2 ♂, 22-IV-76 (J. Parkinson, JP). BEXAR CO.: Shavano Park, 2 ♂, ♀, 6-X-63 (R.O. and C.A. Kendall, ROK); Babcock and F.M. 1604, 12 ♂, 9 ♀, 10-X-63, 11 ♂, 3 ♀, 11-X-63 (all J. W. Tilden, JWT); F.M. 1604, 7 ♂, 2 ♀, 6-X-63, 2 ♂, 2 ♀, 15-IV-67, *ex ova* ♀, 5-II-64, *ex ova* ♂, 12-II-64, *ex ova* ♀, 22-II-64, *ex ova* ♀, 28-II-64 (all R.O. and C.A. Kendall, ROK); Camp Bullis Rd., ♂, 17-IV-73 (W.W. McGuire, WWMc); Loop 1604 and Camp Bullis Rd., 3 ♀, 12-IX-75, 2 ♂, 3 ♀, 13-IX-75, 7 ♂, 4 ♀, 15-IX-75, 2 ♀, 18-IX-75, 4 ♂, 4 ♀, 22-IX-75, 2 ♂, 2♀, 24-IX-75, 3 ♂, 9-IV-76, ♀, 11-IV-76, 2 ♂, 3 ♀, 25-IV-76, *ex ova* ♂, 18-VII-76, *ex ova* ♂, 21-VII-76, *ex ova* ♀, 25-VII-76, 30 ♂, 8 ♀, 16-IV-77, ♂, 17-IV-77, 3 ♂, 8 ♀, 20-IV-77, 5 ♂, 5 ♀, 22-IV-77, 10 ♂, 2 ♀, 24-IV-77, ♀, 25-IV-77 (all W.W. McGuire, WWMc); Loop 1604 and IH 10, 2 ♂, 13-IX-75, ♀, 14-IX-75 2 ♂,

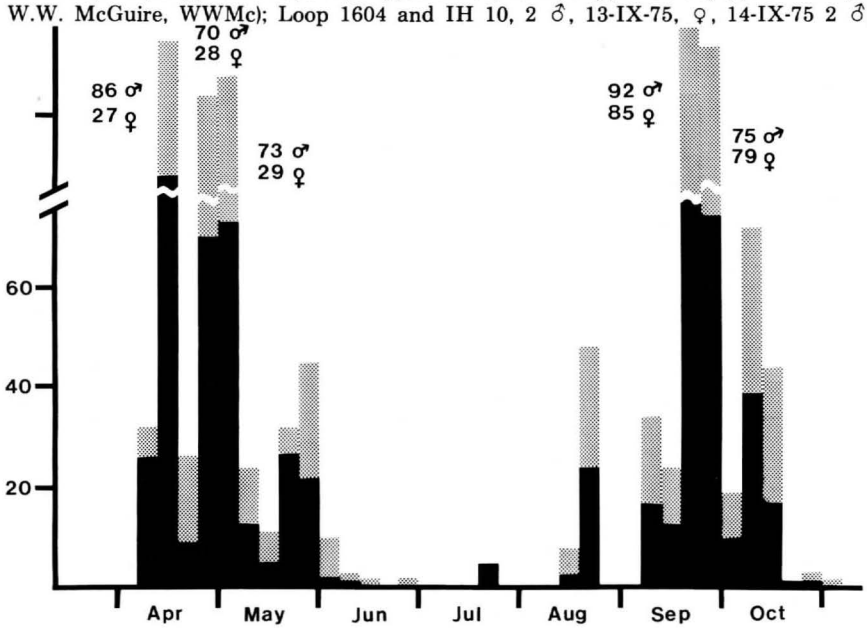


Figure 28: Temporal distribution (based on material examined) of wildcaught adults of *Hesperia viridis* in Texas. Males represented by black bars, females by stippled bars.

16-IX-75, 3 ♀, 18-IX-75, 2 ♂, 4 ♀, 22-IX-75, ♂, 2 ♀, 23-IX-75 (all W.W. McGuire, WWMc); 16 mi N.W. San Antonio, 2 ♂, 2 ♀, 10-X-63 (J.W. Tilden, JWT). BLANCO CO.: Pedernales Falls State Park, 5 ♂, 4 ♀, 4-V-73 (R.O. and C.A. Kendall, ROK); F.M. 165, 8 mi. E. Blanco, ♂, ♀, 27-IX-75 (W.W. McGuire, WWMc); F.M. 165, 10 mi. S.E. Blanco, 9 ♂, 7 ♀, 27-IX-75 (W.W. McGuire, WWMc); F.M. 165, 11 mi. S.E. Blanco, ♂, 2 ♀, 27-IX-75 (W.W. McGuire, WWMc); F.M. 165, 13 mi. E. Blanco, 8 ♂, 6 ♀, 27-IX-75 (W.W. McGuire, WWMc); F.M. 165, 15 mi. E. Blanco, 8 ♂, 4 ♀, 27-IX-75 (W.W. McGuire, WWMc); F.M. 165, 11.7 mi. E. Blanco, 6 ♂, 2 ♀, 23-IX-77 (W.W. McGuire, WWMc); F.M. 165, 13.1 mi. E. Blanco, 11 ♂, 8 ♀, 23-IX-77 (W.W. McGuire, WWMc). BOSQUE CO.: 5 mi. S. Clifton, ♂, 16-V-76 (W.W. McGuire, WWMc). BREWSTER CO.: 24 mi. E. Marathon, U.S. 90, ♀, 11-IX-76 (W.W. McGuire, WWMc); U.S. 90, 35 mi. W. Sanderson, 5 ♂, ♀, 20-V-73, ♀, 9-VI-74 (W.W. McGuire, WWMc); U.S. 90, 30 mi. W. Sanderson, ♂, 8-VI-74 (W.W. McGuire, WWMc); U.S. 90, 14 mi. E. Marathon, ♂, 2 ♀, I-V-77 (W.W. McGuire, WWMc); U.S. 90, 26.8 mi. W. Sanderson, ♀, I-V-77 (W.W. McGuire, WWMc); U.S. 90, 38-39.5 mi. W. Sanderson, 5 ♂, ♀, 30-IV-77, 24 ♂, 7 ♀, I-V-77, 20 ♂, 9 ♀, 2-V-77 (all W.W. McGuire, WWMc); 14 mi. E. Marathon, U.S. 90 *ex ova* ♂, 12-VII-77, *ex ova* ♂, 13-VII-77, *ex ova* ♂, 14-VII-77, *ex ova* 2 ♂, 16-VII-77, *ex ova* ♂, 18-VII-77, *ex ova*, 2 ♂, 19-VII-77, *ex ova* 2 ♂, ♀, 21-VII-77, *ex ova* ♂, ♀, 23-VII-77, *ex ova* 2 ♀, 24-VII-77, *ex ova* 3 ♀, 27-VII-77, *ex ova* ♀, 31-VII-77, *ex ova* ♀,

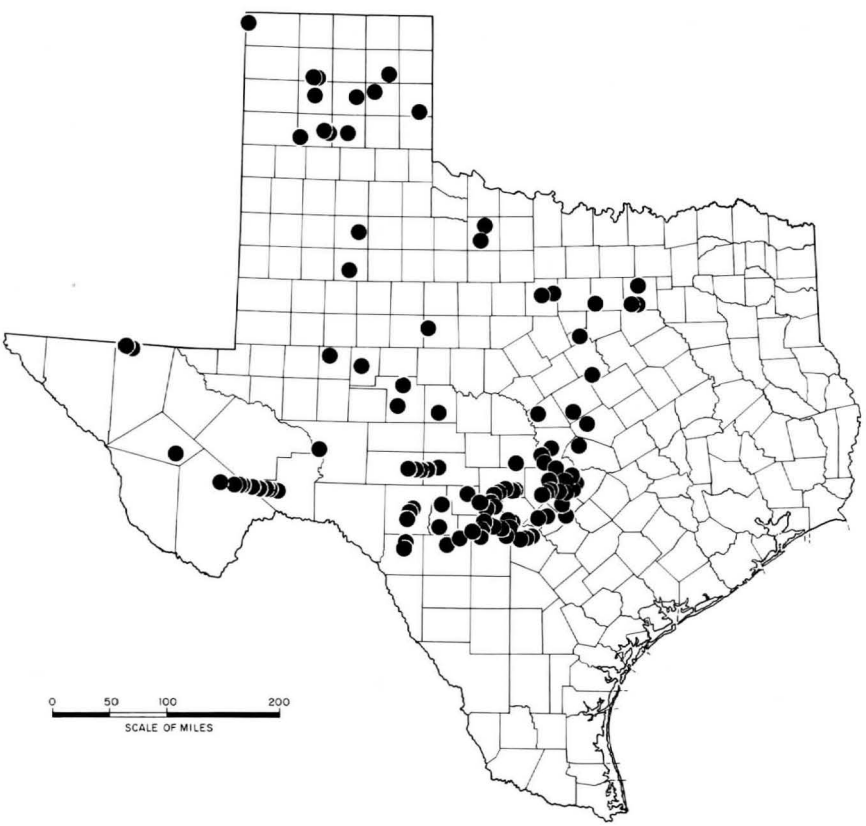
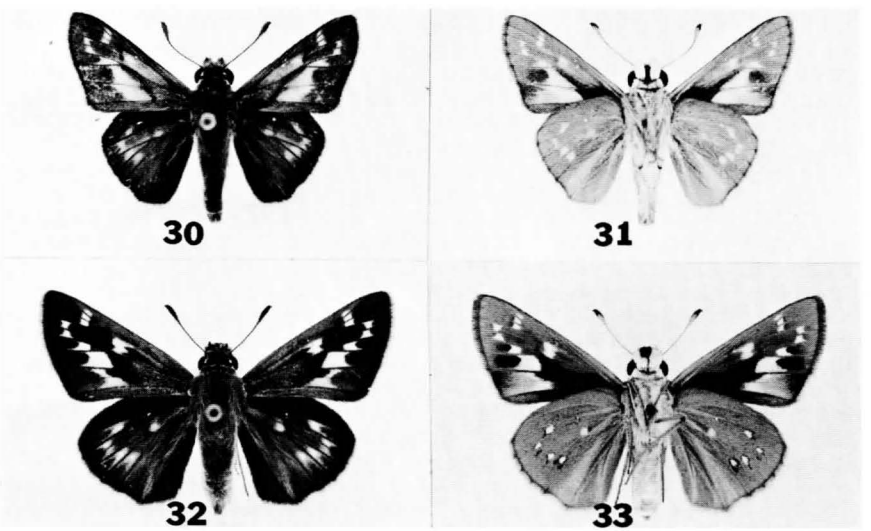


Figure 29: Distribution in Texas of *Hesperia viridis*, represented by closed circles.

5-VIII-77, *ex ova* ♀, 6-VIII-77, *ex ova* ♂, 7-VIII-77 (all W.W. McGuire, WWMc); Marathon, ♂, 3 ♀, 15-V-77 (E. Knudson, EK). BURNET CO.: 10 mi. N.W. Marble Falls, ♂, 9-IV-66 (J.M. Burns, JMB); U.S. 281, 2 mi. S. Burnet, ♂, ♀, 27-IX-75 (W.W. McGuire, WWMc); U.S. 281, 2 mi. S. Marble Falls, 4 ♂, 4 ♀, 27-IX-75 (W.W. McGuire, WWMc) vic. Spicewood, Hwy. 71, 2 ♂, ♀, 15-IX-77 (W.W. McGuire, WWMc). CARSON CO.: White Deer, ♂, ♀, 23-V-43 (H.A. Freeman, CNC), ♂, 23-V-43 (H.A. Freeman, WWMc). COMAL CO.: roadside park on river road, 2 ♂, 2 ♀, 11-V-58, ♀, 15-V-60, ♂, 3 ♀, 8-V-65 (all R.O. and C.A. Kendall, ROK); ♂, 8-V-65 (R.O. and C.A. Kendall, AMNH); U.S. 281, 32 mi. N. San Antonio, ♂, 27-IX-75 (W.W. McGuire, WWMc). CONCHO CO.: nr. Eden, 11 ♂, 15 ♀, 19-IX-73 (R.O. and C.A. Kendall, ROK). CORYELL CO.: 1.5 mi. W. Killeen, Ft. Hood, off Hwy. 190, 2 ♂, 19-IV-75 (J. Parkinson, JP); 4 mi. N.W. Killeen, Ft. Hood, off Range Road, 5 ♂, 2 ♀, 24-IV-76 (J. Parkinson, JP). CROCKETT CO.: U.S. 290 roadside park nr. Pecos River, 2 ♂, ♀, 10-IX-65 (R.O. and C.A. Kendall, ROK); roadside park, ca. 5 mi. E. Pecos River and U.S. 290, 3 ♂, 3 ♀, 23-IX-76 (W.W. McGuire, WWMc). CROSBY CO.: 4 mi. E. Crosbyton, 2 ♂, 4 ♀, 14-VIII-67 (D.L. Lindsley, DLL). CULBERSON CO.: 2 mi. N. Pine Springs, 3 ♂, 19-VII-63 (H. Clench, CM); Guadalupe Cnyn., Guadalupe Mtns., ♀, 20-V-74 (R.A. Bailowitz, RAB); Pine Springs, Guadalupe Mtns., ♂, ♀, 8-IX-69 (J.A. Scott, JAS). DALLAM CO.: Texline, 2 ♂, 19-VII-74 (M. Rickard, WWMc). DALLAS CO.: Lancaster ♀, 24-V-41 (H.A. Freeman, AMNH), ♀, 7-V-40 (H.A. Freeman, HAF); Vickery, ♀, 4-V-40 (H.A. Freeman, HAF); Cedar Hill, ♀, 18-IX-55 (H.A. Freeman, HAF). EDWARDS CO.: Tex. Hwy. 55, ♀, 11-IX-65 (R.O. and C.A. Kendall, ROK); 5 mi. S.W. Rocksprings, F.M. 674, ♂, 5 ♀, 21-VIII-76 (W.W. McGuire, WWMc); 9 mi. S.W. Rocksprings, F.M. 674, 2 ♂, 4 ♀, 21-VIII-76 (W.W. McGuire, WWMc); 12 mi. S.W. Rocksprings, F.M. 674, ♂, ♀, 21-VIII-76 (W.W. McGuire, WWMc). GARZA CO.: ca. 6 mi. S.E. Post, ♀, 22-V-76 (R.O. and C.A. Kendall, ROK). GILLESPIE CO.: Tex. Hwy. 16, 3 ♂, 3 ♀, 9-X-65 (R.O. and C.A. Kendall, ROK); Hwy. 16, 8 mi. S.W. Fredericksburg, 2 ♂, 3 ♀, 28-IX-75 (W.W. McGuire, WWMc); Hwy. 16, 9 mi. S.W. Fredericksburg, 2 ♂, 4 ♀, 28-IX-75 (W.W. McGuire, WWMc); 10-11 mi. S.W. Fredericksburg, 3 ♂, 5 ♀, 28-IX-75 (W.W. McGuire, WWMc); U.S. 290, 8 mi. S.E. Fredericksburg, ♂, ♀, 28-IX-75 (W.W. McGuire, WWMc); U.S. 290, 10 mi. S.E. Fredericksburg, ♂, 3 ♀, 28-IX-75 (W.W. McGuire, WWMc). GRAY CO.: Pampa, 3 ♂, 31-V-42 (Stallings & Turner, S&T). HAYS CO.: U.S. 290, ca. 6 mi. E. Dripping Springs, 7 ♂, 15 ♀, 10-X-65 (R.O. and C.A. Kendall, ROK); ♂, 6 ♀, 10-X-65 (R.O. and C.A. Kendall, AMNH); 4 mi. W. San Marcos, 2 ♀, 2-X-75 (John Vernon, JV); Wimberly, 4 ♂, ♀, 21-IX-75 (M. Rickard, WWMc); FM 165, 16 mi. E. Blanco, ♀, 27-IX-75 (W.W. McGuire, WWMc); U.S. 290, 1 mi. W. Henley, 3 ♂, 7 ♀, 27-IX-75 (W.W. McGuire, WWMc); U.S. 290, 3 mi. E. Henley, 2 ♂, 11 ♀, 27-IX-75 (W. W. McGuire, WWMc); U.S. 290, 6 mi. E. Henley, ♂, 2 ♀, 27-IX-75 (W.W. McGuire, WWMc); U.S. 290, 4 mi. E. Dripping Springs, 9 ♂, 8 ♀, 23-IX-77 (W.W. McGuire, WWMc). JEFF DAVIS CO.: Ft. Davis, 7000 ft. ♂, 10-IV-? (AMNH). KENDALL CO.: ca. 5 mi. N. Boerne, ♀, 8-V-66 (R.O. and C.A. Kendall, ROK); U.S. Hwy. 87, 4 mi. N.W. Boerne, ♀, 22-IV-67 (J.F. Doyle, JFD); nr. Boerne, 2 ♂, ♀, 29-IX-68 (J.F. Doyle, JFD); Hwy. 473, 5 mi. W. Twin Sisters, ♀, 27-IX-75 (W.W. McGuire, WWMc); 4 mi. N. Sisterdale, F.M. 1376, ♂, 3 ♀, 28-IX-75 (W.W. McGuire, WWMc); Hwy. 46, 5 mi. W. Boerne, 9 ♂, 4 ♀, 17-IV-77 (W.W. McGuire, WWMc). KERR CO.: no location, 4 ♂, 30-IV-65 (R.O. and C.A. Kendall, ROK); Ingram, ♂, 4-V-02, ♀, 12-V-02 (all CAS); Kerrville, ♀, ?-?-99, ♂, ?-IV-01, ♀, IV-02, ♂, IV-08, ♂, IX-09, ♀, V-17 (all AMNH); Turtle Creek, ♂, 3 ♀, 9-X-65 (R.O. and C.A. Kendall, ROK); Tex. Hwy. 16 ♂, 28-V-66 (R.O. and C.A. Kendall, ROK); Kerrville, 2 ♂, 8-IV-72 (M. Rickard, WWMc), 4 ♂, ♀, 8-IV-72, F, 9-IV-73, 2 ♂, 16-IV-73, ♀, 22-IV-73 (all W.W. McGuire, WWMc); Kerrville State Park, ♂, 8-IV-72 (W.W. McGuire, WWMc); Hwy. 16, 8 mi. S. Kerrville, ♀, 8-IV-72 (W.W. McGuire, WWMc); Hwy. 16, 6 mi. S. Kerrville, ♂, 16-IV-73 (W.W. McGuire, WWMc); Hwy. 16, 7-10 mi. S. Kerrville, 6 ♂, 2 ♀, 28-IX-75 (W.W. McGuire, WWMc). KIMBALL CO.: 9 mi. W. Junction, U.S. 290, 5 ♂, 4 ♀, 23-IX-76 (W.W. McGuire, WWMc); 2 mi. W. Roosevelt, U.S. 290, ♂, 2 ♀, 23-IX-76 (W.W. McGuire, WWMc). KINNEY CO.: 14 mi. N. Brackettville, 1450 ft., 12 ♂, 7 ♀, 21-VIII-76 (W.W. McGuire, WWMc); 18 mi. N. Brackettville, 1450 ft., 7 ♂, 5 ♀, 21-VIII-76, *ex ova* ♂, 9-XI-76, *ex ova* ♀, 14-XI-76 (all

W.W. McGuire, WWMc). LAMPASAS CO.: Nr. Lometa, ♂, 4 ♀, 30-IV-72 (J.A. Scott, JAS). LLANO CO.: Hwy. 16, 10 mi. N. Eckert, 5 ♂, 5 ♀, 27-IX-75 (W.W. McGuire, WWMc). MEDINA CO.: Tex. Hwy. 16, 2 ♀, 8-V-66 (R.O. and C.A. Kendall, ROK); F.M. 462, S. Tarpley, 2 ♂, 4 ♀, 24-IV-77 (W.W. McGuire, WWMc). MOORE CO.: area 3-8 mi. E. Masterson, 3600 ft., 2 ♂, 18-V-75 (M. Fisher, WWMc); nr. Masterson, 3600 ft., 4 ♂, 18-V-75 (R.E. Stanford, WWMc). PALO PINTO CO.: Mineral Wells, 5 ♂, 4 ♀, 24-V-41 (H.A. Freeman, AMNH); ♂, 6-V-76 (J.R. Powers, CIS), Palo Pinto, ♂, ♀, 13-VIII-55 (H.A. Freeman, HAF). PECOS CO.: 20 mi. W. Sanderson, 2 ♂, 20-V-73 (W.W. McGuire, WWMc); 32 mi. E. Marathon, U.S. 90, ♂, ♀, 11-IX-76 (W.W. McGuire, WWMc); 35 mi. E. Marathon, U.S. 90, ♀, 11-IX-76 (W.W. McGuire, WWMc); 41 mi. E. Marathon, U.S. 90, ♂, 11-IX-76 (W.W. McGuire, WWMc); 26.8 mi. W. Sanderson, U.S. 90, 22 ♂, 30-IV-77 (W.W. McGuire, WWMc). POTTER CO.: 28 mi. S. Dumas, ♀, 2-V-72 (J.A. Scott, JAS). RANDALL CO.: Palo Duro Canyon, ♂, 23-IV-43, ♂, 25-IV-42, ♂, 26-IV-43, ♂, 1-V-43, ♂, 9-V-42, ♂, 15-V-43, ♂, 16-V-42 (all H. A. Freeman, WWMc), ♂, 2-V-42 (AMNH), ♂, 10-V-42 (CAS), ♂, 16-V-42 (AMNH); ♂, ♀, 1-VI-42 (D.B. Stallings, LACM), ♀, 10-V-43, ♂, 11-V-43 (all D. B. Stallings, PSR), ♀, 17-VI-45 (R.L. Langston, RLL), 2 ♂, 28-V-77 (Richard E. Howard, REH), 2 ♂, 3 ♀, 28-V-77 (Richard E. Howard, WWMc); Palo Duro Canyon, 3000 ft., 4 ♂, 18-V-75 (R.E. Stanford, WWMc); Palo Duro Canyon State Park, 3000 ft., 6 ♂, 18-V-75 (M. Fisher, WWMc); Buffalo Lake National Wildlife Refuge, ♀, 28-VI-75 (R.O. and C.A. Kendall, ROK). REAL CO.: 32 mi. W. Mountain Home, Hwy. 41, ♂, 3 ♀, 21-VIII-76 (W.W. McGuire, WWMc); FM 337, 8 mi. E. Camp Wood, 10 ♂, 6 ♀, 24-IV-77 (W.W. McGuire, WWMc). SOMERVILLE CO.: Glen Rose, ♂, ♀, 8-IX-40 (H.A. Freeman, AMNH), 2 ♂, 2 ♀, 8-IX-40 (H.A. Freeman, HAF). STERLING CO.: Tex. Hwy. 158 nr. North Concho River, ♂, 8-V-69 (R.O. and C.A. Kendall, ROK). SUTTON CO.: U.S. Hwy. 290, ca. 20 mi. E. Sonora, 4 ♂, ♀, 9-V-69 (R.O. and C.A. Kendall, ROK); 23 mi. W. Junction, U.S. 290, 7 ♂, 7 ♀, 23-IX-76 (W.W. McGuire, WWMc); 35 mi. W. Junction, U.S. 290, 10 ♂, 4 ♀, 23-IX-76 (W.W. McGuire, WWMc); 36 mi. W. Junction, U.S. 290, 13 ♂, 15 ♀, 23-IX-76 (W.W. McGuire, WWMc). TARRANT CO.: Benbrook Reservoir, Holiday Park, ♀, 27-V-73 (D.E. Allen, DEA), 2 ♂, ♀, 18-V-74, ♀, 16-V-76 (all W.W. McGuire, WWMc), ♂, 19-V-74 (E. Knudson, EK).



Figures 30-33: *Hesperia attalus attalus* (Edwards). 30-31, male upper (30) and under (31) surfaces; TEXAS. Freestone Co.: Hwy. 164, 4.8 mi. W. Buffalo, 15-V-76 (Allyn Museum photos 090479-3/4). 32-33, female upper (32) and under (33) surfaces; same locality, 18-V-75 (Allyn Museum photos 090379-9/10).

TAYLOR CO.: 10 mi. S. Merkel, ♀, 31-X-43 (C.L. Remington, PSR); ♀, 1-XI-43 (C.L. Remington, LACM). TERRELL CO.: 46 mi. E. Marathon, U.S. 90, 2 ♀, 11-IX-76 (W.W. McGuire, WWMc); 44 mi. E. Marathon, U.S. 90, 5 ♂, 11-IX-76 (W.W. McGuire, WWMc); 43 mi. E. Marathon, U.S. 90, 5 ♂, 3 ♀, 11-IX-76 (W.W. McGuire, WWMc); 5 mi. E. Sanderson, U.S. 90, ♀, 11-IX-76 (W.W. McGuire, WWMc). TOM GREEN CO.: Twin Buttes Reservoir, San Angelo, ♂, 23-IX-67 (Daniel S. Burris, DB); 14 mi. N. San Angelo, ♂, ♀, 5-V-59 (J.M. and S.N. Burns, JMB). TRAVIS CO.: Bee Cave Road, ca. 8.5 mi. W.N.W. Austin, 900 ft., 2 ♂, 2 ♀, 12-X-74, 2 ♂, ♀, 2-X-77 (all W.W. McGuire, WWMc); Bee Cave Road, 7 mi. W.N.W. Austin, ♂, 23-IX-77 (W.W. McGuire, WWMc); Bee Cave Road, 11 mi. W.N.W. Austin, ♂, 23-IX-77 (W.W. McGuire, WWMc); Bee Cave Road, 15 mi. W.N.W. Austin, ♂, 23-IX-77 (W.W. McGuire, WWMc); Bee Cave Road, 12 mi. W.N.W. Austin, 2 ♂, 4-X-75 (W.W. McGuire, WWMc); Austin, ♂, 29-X-75, 2 ♂, 2 ♀, 3-X-76, ♀, 9-X-76 (E. Knudson, WWMc); Hwy. 71, ♀, 8-X-75 (E. Knudson, WWMc); S.R. 170 W., 2 ♀, 8-X-75 (E. Knudson, WWMc); Bee Cave Rd., 2 ♂, 6 ♀, 8-X-75, 4 ♂, 2 ♀, 3-X-76, F, 9-X-76 (all E. Knudson, EK); River Hill Road, ♂, 2 ♀, 9-IX-76 (W.W. McGuire, WWMc); U.S. 290, 1.7 mi. W. Oak Hill, ♂, 23-IX-77 (W.W. McGuire, WWMc); nr. Mansfield Dam, Lake Travis, FM 620, 5 ♂, 3 ♀, 15-X-77 (W.W. McGuire, WWMc). UVALDE CO.: Hwy. 55, 20 mi. N. Uvalde, 2 ♀, 1-X-75 (John Vernon, JV); 5 mi. W. Utopia, ♀, 22-IV-74 (John Vernon, WWMc). WHEELER CO.: Shamrock, 2400 ft., 6 ♂, 9 ♀, 26-V-46 (Stallings & Turner, S & T). WILLIAMSON CO.: Florence, block off Hwy. 440, ♂, 11-IV-76 (J. Parkinson, JP); 2 mi. N. Florence, off Hwy. 440, ♂, 13-IX-76, ♂, 3 ♀, 14-IX-76, 3 ♂, 3 ♀, 21-IX-76 (all J. Parkinson, JP).

Hesperia attalus attalus (Edwards)

Figures 30, 31 (♂), 32, 33 (♀), 34 (temporal distribution), 7 (distribution)

Although initially described from the vicinity of Waco, Texas (Edwards, 1871), little data are available on the early distribution of this species in the state. At this time, largely because of a paucity of appropriate virgin grassland habitat, *attalus* remains one of the most isolated and rarest of the *Hesperia* in the state. Indeed, while large established populations exist in Kansas, Oklahoma, and to a lesser degree in southwestern Missouri, only 5 viable colonies have been discovered in the state in the course of an extensive search over the last 5 years. Throughout its range, *attalus* is associated with remnants of virgin grasslands in an isolated section of the Post Oak Savannah, Blackland Prairies and Cross Timbers and Prairies vegetational areas. In Texas, the larval foodplant, as previously reported (McGuire, 1982), is *Leptoloma cognatum* (Schultes); female *attalus* have been observed ovipositing on this grass in

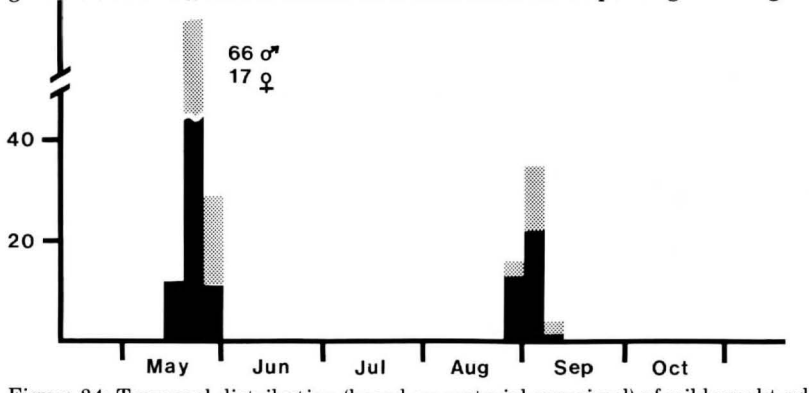
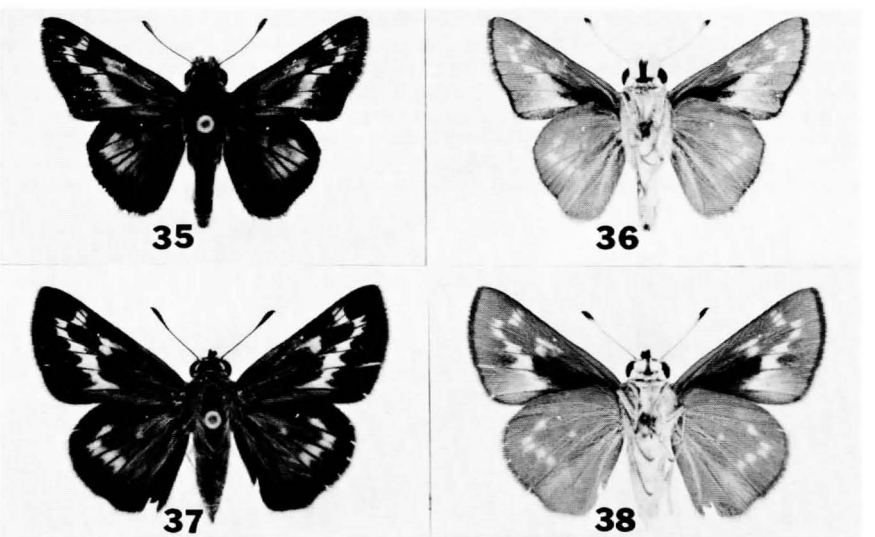


Figure 34: Temporal distribution (based on material examined) of wildcaught adults of *Hesperia a. attalus* in Texas. Males represented by black bars, females by stippled bars.

Freestone County during both spring and fall flight periods. Further information on the life history of *attalus*, as well as population comparisons, will be presented in a separate publication (McGuire, William W. A review of the *Hesperia attalus* complex with description of immature stages. In press).

Flight periods for *Hesperia attalus* in Texas occur during the latter half of May and late August through early September, with each brood being of approximately equal density. The spring brood overlaps slightly with the initial emergence of the spring flight of *Hesperia meskei* (Edwards) in Freestone County, and in Tarrant County the spring and fall flights of *attalus* are in proximity to that of *H. viridis*. Specific records for 125 male and 52 female *H. attalus attalus* follow: COUNTY UNDETERMINED: Black Jack Spgs., ♂, no date (USNM), ♂, no locality or date (Belfrage, USNM). BOSQUE CO.: 5 mi. S. Clifton, 4 ♂, 17-V-76 (W.W. McGuire, WWMc); COOKE CO.: 9 mi. E. Gainesville, US 82, ♂, ♀, 2-IX-73 (W.W. McGuire, ROK), 10 ♂, 8 ♀, 2-IX-73, ♂, ♀, 28-VIII-75, ♂, 3-VI-78, ♀, 10-VI-78 (all W.W. McGuire, WWMc); I.H. 35, 4 mi. N. Gainesville, 3 ♀, 10-VI-78 (W.W. McGuire, WWMc). DALLAS CO.: Dallas, ♀, no date (Boll, MCZ), 2 ♀, no date (AME). FREESTONE CO.: Hwy. 164, 4.8 mi. W. Buffalo, 4 ♂, ♀, 19-V-74, 3 ♂, 3 ♀, 26-V-74, ♂, 28-V-74, 14 ♂, 5 ♀, 18-V-75, 2 ♀, 25-V-75, 6 ♂, ♀, 29-VIII-75, ♂ *ex ova*, 23-XII-75, ♂ *ex ova*, 28-XII-75 ♂ *ex ova*, 29-XII-75, ♂ *ex ova*, 30-XII-75, ♂ *ex ova*, 31-XII-75, ♂ *ex ova*, 13-I-76, ♂ *ex ova*, 23-I-76, ♀ *ex ova*, I-I-76, ♀ *ex ova*, 12-I-76, ♀ *ex ova*, 28-I-76, 6 ♂, 15-V-76, 2 ♂, 22-V-76 (all W.W. McGuire, WWMc); Hwy. 164, 5 mi. W. Buffalo, ♂, ♀, 26-V-74, 9 ♂, ♀, 18-V-75, 4 ♂, 5 ♀, 25-V-75, ♂, 22-V-76, ♀, 1-X-77 (all W.W. McGuire, WWMc); Hwy. 164, 5.7 mi. W. Buffalo, ♀, 30-V-76 (F.Hedges, FH); Hwy. 164, 6.6 mi. W. Buffalo, 2 ♂, 15-V-76, ♂, 22-V-76 ♂, ♀, 29-V-76, ♀, 30-V-76 (all W.W. McGuire, WWMc); Buffalo, ♀, 26-V-74, ♂, ♀, 7-IX-75 (E. Knudson, EK). LEON CO.: Hwy 164, 2.2. mi. W. Buffalo, 2 ♂, 18-V-75, ♂, ♀, 23-V-76 (all W.W. McGuire, WWMc); U.S. 79, ca. 3 mi. W. Buffalo, 2 ♂, ♀, 19-V-74 (W.W. McGuire, WWMc); U.S. 79, ca. 2 mi. W. Buffalo, ♂, 2 ♀,29-V-76 (W.W. McGuire, WWMc). LIMESTONE CO.: 4.1 m. W. Groesbeck, Hwy. 164, 9 ♂, ♀, 22-V-76, 10 ♂, 6 ♀, 23-V-76, ♂ *ex ova*, 5-VIII-76, ♂ *ex ova*, 8-VIII-76, ♂ *ex ova*, 10-VIII-76, ♂ *ex ova*,



Figures 35-38: *Hesperia meskei* (Edwards). 35-36, male upper (35) and under (36) surfaces; TEXAS. Bastrop Co.: vicinity of Bastrop State Park, 4-VI-77 (Allyn Museum photos 090479-1/2). 37-38, female upper (37) and under (38) surfaces; same data (Allyn Museum photos 090379-7/8).

11-VIII-76, ♂ *ex ova*, 12-VIII-76, ♀ *ex ova*, 13-VII-76, ♂ *ex ova*, 14-VIII-76, ♀ *ex ova*, 15-VIII-76, 2 ♂, ♀ *ex ova*, 16-VIII-76, ♀ *ex ova*, 17-VIII-76, ♂ *ex ova*, 20-VIII-76, 2 ♀ *ex ova*, 21-VIII-76, ♀ *ex ova*, 26-VIII-76, ♂ *ex ova*, 27-VIII-76, 7 ♂, 2 ♀, 28-VIII-76, ♂ *ex ova*, 29-VIII-76, ♀ *ex ova*, 31-VIII-76, ♂ *ex ova*, 2-IX-76, 2 ♀ *ex ova*, 3-IX-76, ♀ *ex ova*, 4-IX-76, 9 ♂, 3 ♀, 4-IX-76, ♀ *ex ova* , 12-IX-76, ♂ *ex ova*, 30-IX-76 (all W.W. McGuire, WWMc); PALO PINTO CO.: Mineral Wells, ♀, 24-V-41 (H.A. Freeman, HAF); TARRANT CO.: Benbrook Reservoir, Holiday Park, 9 ♂, 18-V-74 (W.W. McGuire, WWMc); 2 ♂, ♀, 22-V-76 (F. Hedges, FH).

Hesperia meskei (Edwards)

Figures 35, 36 (♂), 37, 38 (♀), 39 (temporal distribution), 12 (distribution)

The original description of *Hesperia meskei* places the type locality as Bastrop, Texas (Edwards, 1877), but prior to 1973 only a few specimens of *meskei* had been collected in the state. Since that time, however, our investigation into the genus as well as contributory data provided by several other collectors has allowed us to locate and characterize several strong populations throughout the eastern portions of Texas. *Hesperia meskei* occupies habitats in both the northern part of the Texas Pineywoods and westward into the Post Oak Savannah habitats in Freestone, Leon and Anderson counties. Throughout this range *meskei* is locally abundant in association with *S. scoparium*, the host plant which I have observed females utilizing for oviposition on numerous occasions in Freestone County (McGuire, 1982). Interestingly, the distribution of *S. scoparium* throughout eastern portions of Texas is considerably more extensive than our observations on the distribution of *meskei*, so other factors concerning the insect's distribution remain to be answered.

In general, *H. meskei* occupies the perimeter of dry, relatively open fields and clearings in the forested Pineywoods and Post Oak Belt, where adults frequently visit yellow composites as nectar sources. The first brood of *H. meskei*, occuring in early June, does have some overlap with the final days of the *H. attalus* emergence, but otherwise no sympatric flights are present. It is noteworthy that *Hesperia metea licinius* occurs in several areas where *meskei* flies later in the year and likewise uses *S. scoparium* as a larval food plant. Current records indicate the confirmed United States distribution for

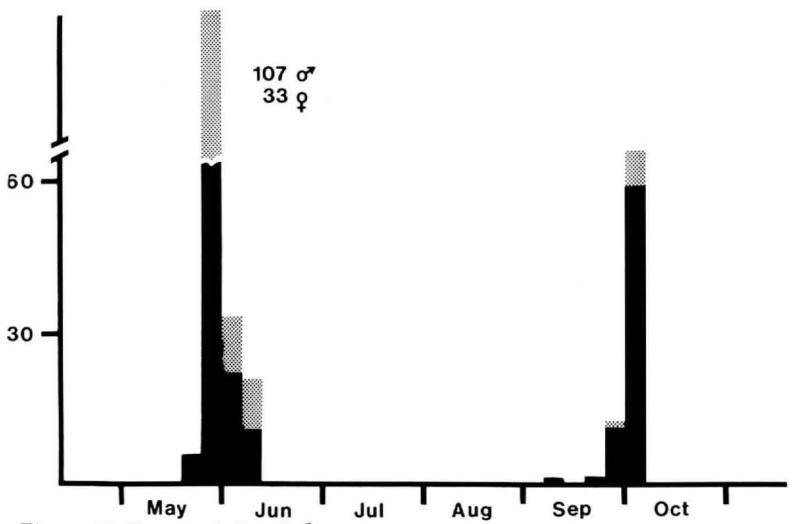


Figure 39: Temporal distribution (based on material examined) of wildcaught adults of *Hesperia meskei* in Texas. Males represented by black bars, females by stippled bars.

Hesperia meskei to include North and South Carolina, Georgia, Florida, Arkansas, and Texas (and most likely Alabama, Mississippi, and Louisiana); a specific review of the entire *meskei* complex, including descriptions of immature states, will follow in a later publication.

The following records have been accumulated for 218 male and 62 female specimens of *Hesperia meskei* collected in Texas:
ANDERSON CO.: 5 mi. W. Palestine, 5 ♂, ♀, 29-V-76 (W.W. McGuire, WWMc); BASTROP CO.: vic. Bastrop State Park, 11 ♂, 3 ♀, 30-V-77, 18 ♂, 7 ♀, 4-VI-77 (W.W. McGuire, WWMc); DALLAS CO.: Vickery, ♂, 10-IX-40 (H. A. Freeman HAF); FREESTONE CO.: Hwy. 164, 3 mi. W. Buffalo, 2 ♀, 26-V-74 (W.W. McGuire, WWMc); Hwy. 164, 3.5 mi. W. Buffalo, ♂, 2 ♀, 28-V-74 (W.W. McGuire, WWMc); Hwy. 164, 4 mi. W. Buffalo, ♂, ♀, 28-V-74 (W.W. McGuire, WWMc); Hwy. 164, 4.8 mi W. Buffalo, 4 ♂, 19-V-74, 8 ♂, 2 ♀, 26-V-74, 2 ♀, 28-V-74, ♂ *ex ova*, 24-VIII-74, 2 ♂, 1-X-77 (all W.W. McGuire, WWMc); Hwy. 164, 5 mi. W. Buffalo, ♂, 26-V-74, ♀, 1-VI-75, ♂, 19-IX-75 (J. Vernon, WWMc), 3 ♂, 26-V-74, 5 ♂, 4 ♀, 7-VI-75, 5 ♂, 1-X-77 (all W.W. McGuire, WWMc); Hwy. 164, 5.7 mi. W. Buffalo, 4 ♂, 3 ♀, 29-V-76 (W.W. McGuire, WWMc); 7 ♂, 2 ♀, 30-V-76 (F. Hedges, FH), ♂, 29-V-76 (W.W. McGuire, CDM); Hwy. 164, 6 mi. W. Buffalo, ♂, 22-V-76 (W.W. McGuire, WWMc), 6 ♂, 30-IX-75 (M. Rickard, WWMc); Hwy. 164, 6.6. mi. W. Buffalo, 4 ♂, ♀, 26-V-74, 2 ♂, 4 ♀, 28-V-74, 4 ♂, 3 ♀, 7-VI-75, 7 ♂, ♀, 1-X-77 (all W.W. McGuire, WWMc); Hwy. 164, 6.8 mi. W. Buffalo, 2 ♂, 29-V-76 (W.W. McGuire, WWMc); Buffalo, 2 ♂, 26-V-74, 2 ♀, 9-VI-74, 2 ♂, ♀, 1-VI-75, ♂, 16-V-76 (all E. Knudson, EK); 1 mi. N. Donie, 3 ♂, ♀, 30-IX-75 (M. Rickard, WWMc); 1.1 mi. N. Donie, 8 ♂, ♀, 29-V-76, 15 ♂, 3 ♀, 2-X-76 (all W.W. McGuire, WWMc); ♂, 29-V-76 (W.W. McGuire, CDM); rest area, IH 45, ca. 15 mi. N. Buffalo, 4 ♂, ♀, 30-V-77 (W.W. McGuire, WWMc); vic. Lake Fairfield, 7 ♂, ♀, 30-V-77 (W.W. McGuire, WWMc). HENDERSON CO.: U.S. 175, 10 mi. E. Athens, 6 ♂, 2 ♀, 30-V-77 (W.W. McGuire, WWMc). LEON CO.: 2 mi. W. Buffalo, Hwy. 164, 2 ♂, 29-V-74, ♀, 2-VI-74, 2 ♂, 29-V-76 (all W.W. McGuire, WWMc); 2.2 mi. W. Buffalo, Hwy. 164, ♂, ♀, 28-V-74, 4 ♂, 2-X-76 (all W.W. McGuire, WWMc); 5 mi. S. Buffalo, U.S. 75, ♂, 2-VI-74 (W.W. McGuire, WWMc), ♂, 30-IX-75 (M.A. Rickard, WWMc); 15 mi. W. Oakwood, Hwy. 79, 3 ♂, 29-V-76 (W.W. McGuire, WWMc). LIMESTONE CO.: 3 mi. S. Mexia, ♂, 30-IX-75 (M. Rickard, WWMc); 3.1 mi. E. Groesbeck, Hwy. 164, 9 ♂, 2 ♀, 1-X-77 (W.W. McGuire, WWMc). MILAM CO.: 8 mi. W. Rockdale, 4 ♂, ♀, 29-V-76 (W.W. McGuire, WWMc); 20 mi. W. Hearne, 4 ♂, 29-V-76 (W.W. McGuire, WWMc). ROBERTSON CO.: 2 mi. N. Hearne, 4 ♂, ♀, 29-V-76 (W.W. McGuire, WWMc); 9.2 mi. W. Marquez, 5 ♂, 29-V-76 (W.W. McGuire, WWMc); 1.4 mi. W. Easterly, 6 ♂, 29-V-76 (W.W. McGuire, WWMc). SMITH CO.: Tyler State Park, ♀, 9-VI-68, 2 ♂, 10-VI-68 (J.R. Heitzman, JRH), 14 ♂, ♀, 2-X-76 (W.W. McGuire, WWMc); ca. 1 mi. N. Jct. IH 20 and FM 14, 3 ♂, 2-X-76 (W.W. McGuire, WWMc).

Hesperia comma susanae Miller

A single male representing this phenotype dated 1 November 1915 and labelled as Marfa, Texas, is contained in the collection of the American Museum of Natural History. After examining the specimen its identity as *susanae* is undeniable, but the likelihood of the collection locality being correct seems remote.

Miller's original description (1962) was based on material from the White Mountains of eastern Arizona, and it is now appreciated that this phenotype is represented by material from throughout the north central portions of New Mexico west to the Mogollon Rim, San Francisco Peaks, and Kaibab Plateau of Arizona; the southern limits appear to be in the Huachuca and Graham Mountains in southeast Arizona and the Jicarilla Mountains in central New Mexico (where there is some blending of other phenotypic expressions). The vicinity of Marfa is in no instance supportive of habitats typical of those occupied by *susanae* throughout the above noted range, and save for the Guadalupe Mountains, appropriate habitat probably does not occur in Texas. While further collecting efforts are in order to conclusively negate the presence of *susanae* in

Texas, the data now present make this record a dubious one, and the specimen is herein regarded as probably mislabeled.

Other *Hesperia* records

Finally, it should be noted that Evans (1955) records specimens of *H. dacotae* Skinner, *H. sassacus* Harris, and *H. leonardus* Harris in the collection of the British Museum of Natural History and bearing labels for Texas. While these specimens have not been examined by me to date, their validity as coming from Texas seems remote based on the known habits and distribution of these species. Accordingly, they are not considered further at this time nor considered as part of the *Hesperia* occurring in the state.

It has been the intended purpose of this paper, through the presentation of spatial and temporal records and general habitat summaries, to at least partially define the status of the genus *Hesperia* in Texas. As is obvious from the data presented, this task is far from completed. Most of the information has been provided by a small number of workers; the fact that over 95% of Texas land is privately owned, fenced, and thus largely inaccessible further impedes our understanding. On the other hand, much has been learned in the last 6 years through our concerted, albeit limited, efforts, so optimism for future knowledge through cooperative ventures must be high. Because these studies have enabled us to discover and clarify the life histories of all but one of the *Hesperia* in Texas, further investigations may in part be more precisely directed and hopefully of even greater reward. Assistance from all interested individuals is solicited.

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