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**DISTRIBUTION OF DRAGONFLIES AND DAMSELFLIES (ODONATA) IN  
FLORIDA**

*Sidney W. Dunkle* p. 29-50

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# DISTRIBUTION OF DRAGONFLIES AND DAMSELFLIES (ODONATA) IN FLORIDA

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## INTRODUCTION

The State of Florida is particularly interesting with regard to Odonata distributions because it encompasses the northern or southern edge of the geographic range of many species. A total of at least 162 species of Odonata, 118 Dragonflies (Anisoptera) and 44 Damselflies (Zygoptera), a third of the North American fauna, has been found within its borders. Of these, 6 species, all Anisoptera, are vagrants or migrants which rarely if ever breed in Florida (*Anax amazili*, *Brachymesia herbida*, *Libellula pulchella*, *Sympetrum corruptum*, *Tramea binotata*, *T. calverti*). Thus 156 odonates, including 1 accidentally introduced species (*Crocothemis servilia*), can be considered Florida residents.

Florida is a large state, with an east-west Panhandle 325 km long, and a north-south Peninsula 595 km long. All of Florida lies within the Southeastern Coastal Plain of the United States, with no land higher than about 105 m. Florida is divided into 67 counties of widely varying sizes which are diagrammed in Fig. 1 and listed in Table 1. The Panhandle extends eastward to about the Aucilla River between Leon and Madison Cos. (counties 16-17 in Fig. 1). The Apalachicola River divides the Panhandle into the Western Panhandle and the Eastern Panhandle between Calhoun and Liberty Cos. (counties 9 and 12). The Florida Keys are a string of islands trailing 155 km southwestward from the tip of the Peninsula, while the Dry Tortugas are a cluster of islands located 110 km west of the southern end of the Keys. Both the Keys and Dry Tortugas are considered part of Monroe Co., but are listed separately throughout this article; Co. "66" in the tabulation refers to the mainland part of Monroe Co.

## LITERATURE

There is an extensive literature on the Odonata of Florida, listed in the Bibliography of this report, but only one analysis of the entire fauna has been done (Byers 1930). It is interesting to note how much the biology of Odonata, and the knowledge of it, has changed in Florida since Byers' survey. A total of 62 species have been added to the Florida list since 1930, including 17 species newly described since then (Table 2). A few other reports have dealt with parts of the Florida odonate fauna: Johnson & Westfall (1970) and Dunkle (1990) on Zygoptera, Paulson (1966) on Anisoptera of southern Florida, Dunkle (1989) on Anisoptera of the Florida Peninsula, Dunkle & Westfall (1982) on threatened species, Cross (1951, 1956) on Anisoptera of the Tallahassee area, Daigle (1978) on Orange Co., Davis & Fluno (1938) on Winter Park, Belle (1978) and Needham (1949) on Highlands Co., Pearse (1932) on the Dry Tortugas, and Wright (1944a) on New Smyrna Beach. Some other papers have each added 2 or more records to Florida Odonata distributions: Bick et al (1950), Byers (1928-1938), Cross (1963), E.M. Davis (1938), Kiauta & Van Brink (1978), Neal & Whitcomb (1972), Paulson (1964), Westfall (1941, 1953b), Williamson (1922a, 1922b), and Wright (1943). Numerous other reports have added single species to the Florida list, or described odonate species or their larvae. Finally, a few popular articles on Florida Odonata have appeared, including Byers (1931b), Dunkle (1991), and Needham (1951). The latter two

articles, and the books by Dunkle (1989, 1990) include numerous color photographs.

## ENDEMIC ODONATA

Florida has more endemic Odonata than any other of the United States or Canadian Provinces. These include 1 zygopteran (*Nehalennia pallidula*) and 5 anisopterans (*Gomphus westfalli*, *Progomphus alachuensis*, *Didymops floridensis*, *Epitheca stella*, *Libellula jesseana*). In addition, 2 subspecies are endemic to the Florida Peninsula (*Argia fumipennis atra*, *Gomphus cavillaris cavillaris*). Also, 5 anisopterans are nearly endemic to Florida (*Gomphus geminatus*, *Progomphus bellei*, *Cordulegaster sayi*, *Epitheca sepia*, *Somatochlora calverti*).

Most of the endemic Florida Odonata are members of closely related taxon pairs. Four of these are allopatric: *Progomphus alachuensis* / *P. bellei*, *Gomphus cavillaris cavillaris* / *G. c. brimleyi*, *Argia fumipennis atra* / *A. f. fumipennis*, and *Nehalennia pallidula* / *N. minuta*. Only the *Nehalennia* are definitely structurally distinct. Three other species pairs are at least partially sympatric: *Didymops floridensis* / *D. transversa*, *Libellula jesseana* / *L. awripennis*, and *Epitheca stella* / *E. costalis*, of which the *Didymops* and *Epitheca* are barely structurally distinct. These 7 endemic taxa probably evolved in the Florida Peninsula when it was an archipelago of islands, and before those islands were joined to the mainland of North America.

How much time was available for the evolution of the endemic taxa in the preceding paragraph? According to Richard Franz of the Florida Museum of Natural History (pers. comm. 1991), there was dry land in the area of the Florida Peninsula as early as 25 million years ago, but the time when these islands became joined to the mainland cannot yet be pinpointed. Indeed, such a land bridge was probably submerged several times by rises in sea level, including Pleistocene interglacial periods. Four of the endemics listed above (*P. alachuensis*, *G. c. cavillaris*, *D. floridensis*, and *L. jesseana*) are restricted today to sand-bottomed lakes and no doubt evolved in that habitat. The oldest such lake in Florida is about 55000 years old. However, a series of other lakes may have been present in Florida previous to those existing today whose basins became filled by erosion and ecological succession. Clench & Turner (1956) in a study of freshwater molluscs stated on p. 104 that "Though the differences between many of the species of central and southern Florida and the regions to the north are not great, they exist in sufficient numbers to warrant an explanation. [The central Florida Island] ... must have been large, at least large enough to have had a freshwater drainage system with some lakes and perhaps some fairly large creeks." Much additional data bearing on these problems is given in a study of Floridian biogeography by Neill (1957). In conclusion, of the many million years available for the evolution of the endemic Florida odonates, I judge that, for still unknown reasons, it has taken only some fraction of the last million years to derive the relatively small differences we see between the endemic Florida odonates and their respective closest relatives.

Table 1. List of Florida Counties, listed from northwest to southeast. Counties 1 - 10 constitute the Western Panhandle, counties 11 - 16 the Eastern Panhandle, counties 17 - 67 the Peninsula, counties 61 - 67 South Florida. The location of certain landmark cities is also indicated.

- |                           |                               |
|---------------------------|-------------------------------|
| 1. Escambia - Pensacola   | 34. Levy                      |
| 2. Santa Rosa             | 35. Marion - Ocala            |
| 3. Okaloosa               | 36. Flagler                   |
| 4. Walton                 | 37. Citrus                    |
| 5. Holmes                 | 38. Sumter                    |
| 6. Washington             | 39. Lake                      |
| 7. Bay                    | 40. Volusia                   |
| 8. Jackson                | 41. Hernando                  |
| 9. Calhoun                | 42. Pasco                     |
| 10. Gulf                  | 43. Seminole                  |
| 11. Gadsden               | 44. Orange - Orlando          |
| 12. Liberty               | 45. Pinellas - St. Petersburg |
| 13. Franklin              | 46. Hillsborough - Tampa      |
| 14. Leon - Tallahassee    | 47. Polk                      |
| 15. Wakulla               | 48. Osceola                   |
| 16. Jefferson             | 49. Brevard                   |
| 17. Madison               | 50. Manatee                   |
| 18. Hamilton              | 51. Hardee                    |
| 19. Columbia              | 52. Highlands                 |
| 20. Baker                 | 53. Okeechobee                |
| 21. Nassau                | 54. Indian River              |
| 22. Taylor                | 55. St. Lucie                 |
| 23. Lafayette             | 56. Sarasota                  |
| 24. Suwannee              | 57. DeSoto                    |
| 25. Union                 | 58. Charlotte                 |
| 26. Bradford              | 59. Glades                    |
| 27. Duval                 | 60. Martin                    |
| 28. Clay                  | 61. Lee - Ft. Myers           |
| 29. St. Johns             | 62. Hendry                    |
| 30. Dixie                 | 63. Palm Beach                |
| 31. Gilchrist             | 64. Collier - Naples          |
| 32. Alachua - Gainesville | 65. Broward - Ft. Lauderdale  |
| 33. Putnam                | 66. Monroe - Keys, Dry        |
| Tortugas                  |                               |
|                           | 67. Dade - Miami              |

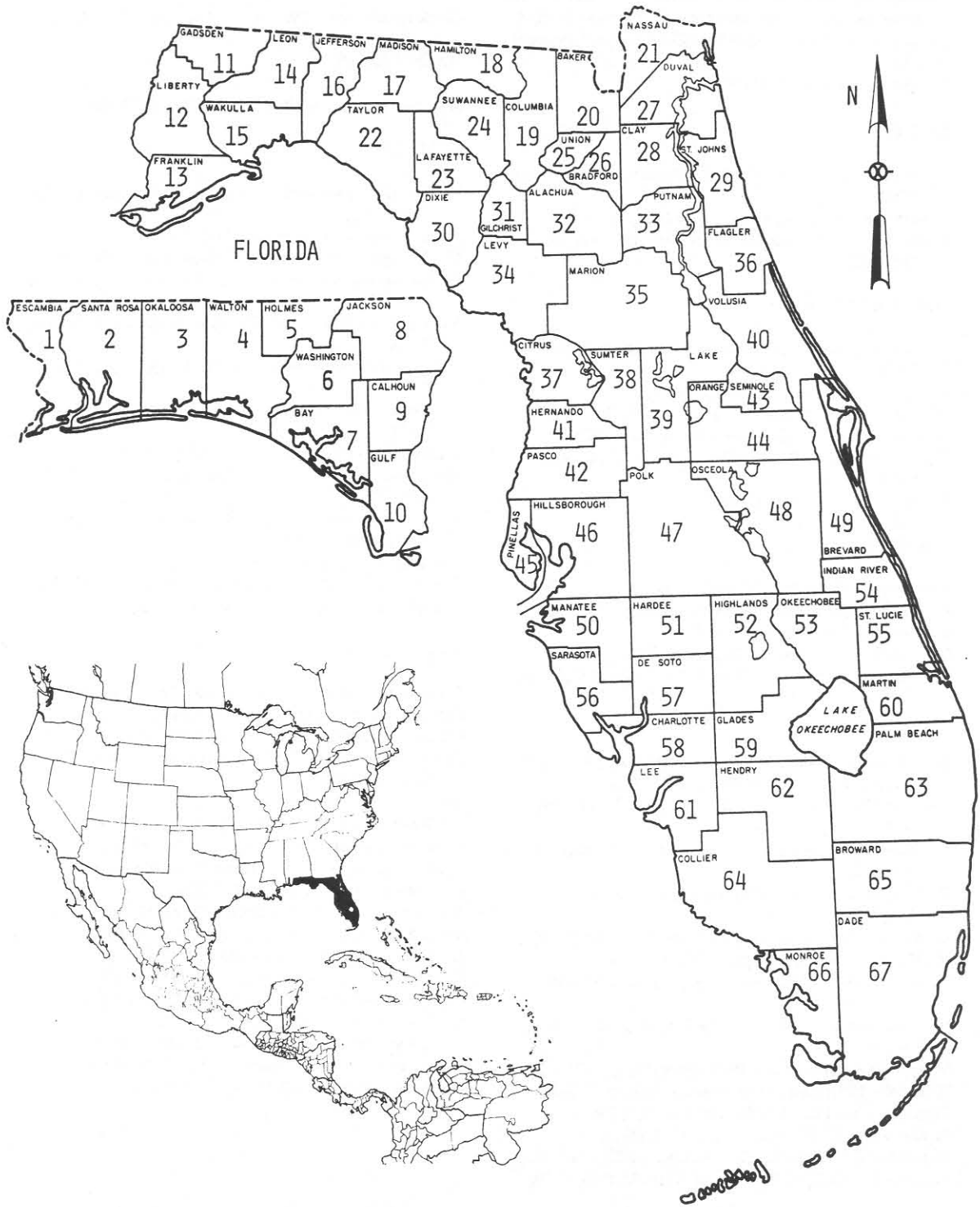


Fig. 1 Map of Florida, showing counties

Table 2. Florida Odonata not listed by Byers (1930), and the first year each was recorded for Florida in the literature as well as the earliest dates of specimens seen by the author. Most of the latter were from the Florida State Collection of Arthropods (FSCA).

\* = species described after 1930.

#### LESTIDAE

- Lestes inaequalis* -- 1969, Westfall & Tennesen (1973); 1969, FSCA  
*L. rectangularis* -- 1934, Byers (1934); 1924, FSCA  
*L. spumarius* -- 1990, Dunkle (1990); 1988, University of Florida Coll.

#### COENAGRIONIDAE

- Enallagma basidens* -- 1970, Johnson & Westfall (1970); 1957, FSCA  
*E. civile* -- 1942, Wright (1943); 1954, FSCA  
*\*E. davisii* -- 1941, Westfall (1943a); 1971, FSCA  
*Ischnura kellicottii* -- 1934, Byers (1934); 1934, FSCA  
*Neocythromma cultellatum* -- 1962, Paulson (1964); 1963, FSCA  
*\*Telebasis byersi* -- 1921, Westfall (1957); 1922, FSCA

#### AESHNIDAE

- Anax amazili* -- 1936, Byers (1938); 1936, FSCA  
*Basiaeschna janata* -- 1951, Westfall (1953b); 1951, FSCA  
*Coryphaeschna adnexa* -- 1980, FSCA  
*C. viriditas* -- 1936, Byers (1938); 1936, FSCA  
*Gomphaeschna furcillata* -- 1936, Gloyd (1940); 1937, FSCA

#### GOMPHIDAE

- Dromogomphus armatus* -- 1935, Byers (1936a); 1950, FSCA  
*D. spinosus* -- 1935, Byers (1936a); 1935, FSCA  
*Gomphus (Gomphurus) hybridus* -- 1951, Westfall (1953b); 1953, FSCA  
*\*G. (Gomphurus) modestus* -- 1982, Dunkle & Westfall (1982); 1973, FSCA  
*G. (Gomphurus) vastus* -- 1982, Dunkle & Westfall (1982); 1981, FSCA  
*\*G. (Gomphurus) geminatus* -- 1971, Carle (1979); 1971, FSCA  
*G. (Phanogomphus) exilis* -- 1969, FSCA  
*\*G. (Phanogomphus) hodgesi* -- 1982, Dunkle & Westfall (1982); 1973, FSCA  
*\*G. (Phanogomphus) westfalli* -- 1972, Carle & May (1987); 1974, FSCA  
*\*Progomphus alachuensis* -- 1921, Byers (1939); 1921, FSCA  
*\*P. bellei* -- 1951, Knopf & Tennesen (1980); 1951, FSCA  
*\*Stylurus ivae* -- 1950, Westfall (1953b); 1950, FSCA  
*\*S. laurae* -- 1953, Westfall (1953b); 1953, FSCA  
*\*S. potulentus* -- 1982, Dunkle & Westfall (1982); 1970, FSCA  
*\*S. townesi* -- 1982, Dunkle & Westfall (1982); 1969, FSCA

#### CORDULEGASTRIDAE

- Cordulegaster sayi* -- 1896, Westfall (1953b); 1896, FSCA

#### MACROMIIDAE

- Macromia georgina* -- 1930, Byers (1931); 1930, FSCA

#### CORDULIIDAE

- Epütheca (Tetragoneuria) costalis* -- 1951, Tennesen (1973); 1924, FSCA  
*E. (Tetragoneuria) semiaquea* -- 1988, FSCA  
*\*E. (Tetragoneuria) sepia* -- 1932, Gloyd (1933); 1921, FSCA  
*E. (Tetragoneuria) spinosa* -- 1982, Dunkle & Westfall (1982); 1976, FSCA  
*Helocordulia selysii* -- 1982, Dunkle & Westfall (1982); 1974, FSCA  
*\*Neurocordulia alabamensis* -- 1941, Westfall (1953b); 1941, FSCA  
*N. molesta* -- 1953 (exuviae), Westfall (1953b); 1955 (adult), FSCA  
*N. obsoleta* -- 1982, Dunkle & Westfall (1982); 1972, FSCA  
*\*Somatochlora calverti* -- 1932, Williamson & Gloyd (1933); 1951, FSCA  
*S. georgiana* -- 1982, Dunkle & Westfall (1982); 1974, S. Dunkle Coll.  
*S. linearis* -- 1925, Byers (1934); 1925, FSCA  
*S. provocans* -- 1933, Williamson & Gloyd (1933); 1971, FSCA  
*S. tenebrosa* -- 1971, Neal & Whitcomb (1972); 1971, FSCA

#### LIBELLULIDAE

- Brachymesia herbida* -- 1960, Paulson (1964); 1960, FSCA  
*Celithemis elisa* -- 1942, Wright (1943); 1955, FSCA  
*\*C. verna* -- 1950, Westfall (1953b); 1956, FSCA  
*Crocothemis servilia* -- 1975, Paulson (1978a); 1975, K. Tennesen Coll.  
*Dythemis velox* -- 1972, FSCA  
*Erythemis plebeja* -- 1989, Dunkle (1989); 1971, FSCA  
*Idiataphe cubensis* -- 1937, Westfall (1954); 1937, FSCA  
*\*Libellula needhami* -- 1885, Westfall (1943b); 1924, FSCA  
*L. pulchella* -- 1943, Wright (1945); 1940, FSCA  
*Miathyria marcella* -- 1934, Byers (1936a); 1947, FSCA  
*Micrathyria aequalis* -- 1989, Dunkle (1989); 1985, FSCA  
*M. didyma* -- 1989, Dunkle (1989); 1985, FSCA  
*Pantala hymenaea* -- 1931, Pearse (1932); 1931, FSCA  
*Sympetrum ambiguum* -- 1922, Byers (1936a); 1975, FSCA  
*S. vicinum* -- 1973, FSCA  
*Tauriphila australis* -- 1949, Bick et al (1950); 1950, FSCA  
*Tramea binotata* -- 1989, Dunkle (1989); 1979, FSCA  
*T. calverti* -- 1989, Dunkle (1989); 1950, FSCA

## ODONATE COLONIZATION OF FLORIDA

Clearly the majority of the Florida odonate fauna is North Temperate in origin, though the exact percentage is debatable. Considering first the Zygoptera, about 32/44 species (73%) entered Florida from the north. These 32 species include the 6 Floridian *Argia* species, because they appear to be well adapted to temperate conditions, and none range south of Mexico, even though the center of *Argia* evolution is obviously Neotropical. Only 4 zygopterans certainly entered Florida from the south (4/44 = 9%). These species are *Lestes spumarius*, *L. tenuatus*, *Neoerythromma cultellatum*, and *Nehalennia pallidulum*, the last according to the phylogenetic analysis of De Marmels (1984). Three other damselflies have entered Florida from the west (*Enallagma basidens*, *E. civile*, *Telebasis byersi*), or 3/44 = 7%. The remaining 5 zygopterans are of problematical origin. *Ischnura hastata* and *I. ramburii* are so widespread that it is difficult to say from which direction they entered Florida--probably from all directions! Since most *Enallagma* are North Temperate, it is most likely that *E. coecum* invaded the Greater Antilles from Florida rather than the reverse. *Hetaerina americana* and *H. titia* entered Florida from the north or west, depending on one's point of view. Perhaps the west is most likely because the center of *Hetaerina* evolution is Neotropical, and these species are well adapted to tropical conditions in Central America.

The origin of Floridian Anisoptera is more difficult to categorize, although as in the Zygoptera 72% entered Florida from the north (about 80 of 111 resident species). I included *Brachymesia gravida*, *Erythemis simplicicollis*, *Perithemis tenera*, *Tramea carolina*, and *T. lacerata* in this category with some doubt. Approximately 15% (17/111) of the Anisoptera fauna entered Florida from the south, and possibly *Anax longipes*, *Coryphaeschna ingens*, and *Tramea onusta* should be added to this group. Finally, about 6% (7/111) probably entered Florida from the west, to which *Aphylla williamsoni* and *Erythrodiplax connata minuscula* might be added. The distribution of 2 subspecies of *Erythrodiplax berenice* in Florida indicates that this species entered Florida from the west (and is so categorized above) as *E. b. berenice*, and from the south as *E. b. naeva*. *Pantala flavescens* and *P. hymenaea* probably entered Florida from all directions.

## Distribution of Odonata in Florida

Florida includes the northern extent of the geographical range for 10 tropical odonates, and is the only state of the U.S. in which those species occur (*Lestes spumarius*, *L. tenuatus*, *Neoerythromma cultellatum*, *Coryphaeschna adnexa*, *C. viriditas*, *Idiataphe cubensis*, *Micrathyria didyma*, *Tauriphila australis*, *Tramea abdominalis*, and *T. insularis*). It should also be noted that the primary U.S. range for *Gynacantha nervosa* and *Triacanthagyna trifida* is the Florida Peninsula.

Another category of interest among Florida Odonata are those species which range widely in eastern or southeastern North America, but which have the southern edges of their ranges in Florida. Of a total of 103 such species, 25 (only 2 of which are Zygoptera) range south into the Florida Panhandle, while 78 more range into the Peninsula. Among the latter species, the range of 20 extends to the tip of the Peninsula, or in a few cases into the Keys or Dry Tortugas (i.e. to the southeasternmost extent of land in North America). The most

interesting species are the 58 whose ranges end somewhere in the Peninsula. The major distributional endpoints are near Gainesville, Alachua Co. (Co. 32, 17 species), near Orlando, Orange Co. (Co. 44, 8 species), and at the level of Lake Okeechobee, primarily Highlands Co. (Co. 52, 20 species). Additionally, a considerable number of species end their ranges a little further south, at the latitude of Lee Co. (Co. 61, 8 species), or Collier Co. (Co. 64, 10 species).

Reasons for the above distributional endpoints are difficult to explain. The major break at Lake Okeechobee is partly explained by the fact that the sandy Central Florida Ridge, a system of fossil sand dunes, ends near the lake. Thus odonates whose larvae require flowing water or a sand substrate have little if any habitat further south. The southernmost good lotic habitats are the Peace River in DeSoto Co. (Co. 57), and Fisheating Creek in Glades Co. (Co. 59). The distributional breaks noted above are probably also related to temperature, most likely minimum winter temperatures, but just what aspect of the temperature regime is most important is not known. Data from Fernald (1981) indicates that the average minimum annual temperature at Gainesville is 15 deg C, at Orlando 17 deg C, and at Lake Okeechobee 19 deg C (59, 62, and 67 deg F respectively). The average January minimum temperatures for these locations are 7, 10, and 11 deg C (45, 50, and 52 deg F). Maps of frost and growing season data seem to correspond less closely to presently known odonate distributions than do the mean temperatures just given.

Florida is the only place in the U.S. in which an Old World odonate has so far become established (as mentioned above, *Crocothemis servilia*, but see also *Potamarcha obscura* under Doubtful Records). The fact that 5 Neotropical odonates (*Lestes spumarius*, *Coryphaeschna adnexa*, *Erythemis plebeja*, *Micrathyria aequalis*, *M. didyma*) have become established in South Florida since the thorough collecting effort of Paulson (1966) suggests that some or all of these could also have been introduced by human agency. However, hurricane transport of these species from Cuba is also likely.

## THE FUTURE

Florida's natural environments are rapidly changing for the worse due to the human population influx. In recent years the equivalent of a large city the size of Tampa has been added to the state every year. The southern tip of the Peninsula and the Keys have been particularly heavily impacted, with the original ecology almost unrecognizable in the Miami area due to urbanization, agriculture, water diversion, and the invasion of exotic fish and trees. There formerly was a short but flowing Miami River, long since canalized, whose original odonate fauna is essentially unknown. If there is a global warming due to greenhouse gases, and a concomitant sea level rise, southern Florida will be one of the first areas to be flooded. Several Florida Odonata, including some endemics such as *Progomphus alachuensis* and *Didymops floridensis*, inhabit clear water, sand bottomed lakes, which are particularly beloved by housing developers. Most of these lakes will soon be urbanized and eutrophicated, and as the lake bottoms change from sand to muck, the endemics mentioned, and especially *Libellula jesseana*, will be eliminated.

Some comments on odonate population trends and future research needs are included in individual species accounts.



## ANNOTATED LIST OF FLORIDA ODONATA

## Problems in Compilation

In preparing the annotated list which follows, numerous problems were encountered. Since some of the adult specimens which I examined had been misidentified, I have listed primarily only the adult specimens which I personally examined, and these are listed by County Number only (from Table 1). Records of adults which I thought were reliable from the literature and from other odonatologists are given with a citation. Larval records are included only for those species which I believe to be unmistakable, namely *Nasiaeschna*, *Aphylla*, and *Hagenius*. Sight records are given only for *Anax longipes*. I encountered a few instances where the collector had labelled a specimen with the wrong county; in most cases I would not know if the specimen was wrongly labelled and any such remaining mistakes have been herein perpetuated.

## Collections Examined

Collections examined were the author's collection, Florida State Collection of Arthropods (FSCA), International Odonata Research Institute Collection (IORI), National Museum of Natural History Collection (USNM), and the J.J. Daigle Collection (JJD). In 1973 the author also examined the Anisoptera in the K.J. Tennessen Collection (KJT), K.W. Knopf Collection (KWK), and F.C. Johnson Collection (FCJ). The FSCA includes the M.J. Westfall, Jr. Collection and most of the G.F. Byers Collection.

## Nomenclature

The names used in this report reflect the author's current views. Differences from the names used by some other authors, and some of the reasons for these, include:

*Enallagma coecum* -- *E. cardenium* is a synonym (M.J. Westfall pers. comm.).

*Enallagma daeckii* -- not in *Teleallagma* because the latter genus was sunk by Donnelly (1973).

*Anomalagrion* -- a subgenus of *Ischnura* after De Marmels (1987).

*Ischnura prognata* -- instead of *I. prognatha* because the former spelling was used in the original description.

*Nehalennia pallidula* -- not in *Argiallagma* because the latter genus was sunk by De Marmels (1984).

*Arigomphus* -- a genus instead of a subgenus of *Gomphus* after Carle (1986).

*Gomphurus* -- a subgenus of *Gomphus* after Needham & Westfall (1955).

*Gomphus geminatus* -- placed in the subgenus *Gomphus* due to the sinking of *Hylogomphus* by Carle (1986).

*Phanogomphus* -- the subgenus used by Carle (1986) for species formerly in the subgenus *Gomphus*.

*Stylurus* -- a genus instead of a subgenus of *Gomphus* after Carle (1986).

*Epicordulia* -- a subgenus of *Epiptera* (K.J. Tennessen, pers. comm.).

*Tetragoneuria* -- a subgenus of *Epiptera* (K.J. Tennessen, pers. comm.).

*Epiptera princeps* -- includes *E. regina* as a clinal form in the author's opinion.

*Brachymesia* -- used for *B. gravida* and *B. herbida* because *Cannacria* should be sunk (M.J. Westfall, pers. comm.).

*Erythemis* -- used for *E. vesiculosa* because the author regards *Lepthemis* as a synonym of *Erythemis*.

*Libellula* -- used for *L. deplanata* because the author regards *Ladona* as a synonym of *Libellula*.

*Libellula* -- used for *L. lydia* instead of *Plathemis* because in the author's opinion it is not generically distinct. Unfortunately *Plathemis* probably can not be used for a subgenus for complex nomenclatorial reasons.

*Perithemis tenera* -- *P. seminole* is a synonym in the author's opinion.

*Sympetrum corruptum* -- not in *Tarnetrum* because the latter genus was sunk by Tai (1967).

*Tramea binotata* -- a species separate from *T. insularis* (R.W. Garrison, pers. comm.).

*Tramea calverti* -- a species separate from *T. cophysa* of South America after De Marmels & Racenis (1982).

## ACKNOWLEDGEMENTS

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## ZYGOPTERA

## CALOPTERYGIDAE

## [1] CALOPTERYX DIMIDIATA Burmeister 1839

(*Agrion dimidiatum*, Byers 1930)

1, 2, 3, 4, 8, 9, 10, 11, 12, (13, Hagen 1890a, and Johnson 1973c), 14, 15, 16, (17, Johnson 1973c), 19, 21, 25, 26, (27, Johnson 1973c), 28, 32, 33, 34, 35, 38, 39, 43, 44, (46, Johnson 1973c), (50, Shiffer), 52, (57, Johnson & Westfall 1970)

Uncommon on clear streams south to Highlands Co.

Flight season 15 Feb - 11 Nov.

## [2] CALOPTERYX MACULATA (Beauvais 1805)

(*Agrion maculatum*, Byers 1930)

(1, Johnson 1974), 2, 3, (4, 6, Johnson 1974), 8, 9, 10, 11, 12, 14, (15, Johnson 1974), 16, (17, 18, Johnson 1974), 19, (20, 22, 24, Johnson 1974), 25, 26, 27, 28, 32, (33, Johnson 1974), (33, Hagen 1861), 34, 35, 38, 39, 40, 42, 43, 44, 46, (47, Johnson 1974), 48, (51, Johnson 1974), 52

Common on forest streams south to Highlands Co.

Flight season 7 Feb - 3 Dec.

## [3] HETAERINA AMERICANA (Fabricius 1798)

8, 9

Known in Florida only from an apparent Pleistocene relict population on the Chipola River as discussed by Johnson (1973a).

Flight season 12 April - 15 Aug.

## [4] HETAERINA TITIA (Drury 1773)

(2, Johnson 1973a), 6, 8, 9, 11, (12, Johnson 1973a), 15, 18, 19, (24, Johnson 1973a), 25, 26, 28, 30, (31, Johnson 1973a), 32, 34, 35, 37, 38, 43, 44, 47, 50, 51, 52, 57, (61, Johnson 1973a), 62



Uncommon on permanently flowing streams and rivers south to Hendry Co.

Flight season probably all year but not recorded February.

#### LESTIDAE

##### [5] LESTES DISJUNCTUS AUSTRALIS Walker 1952

(*L. forcipatus* Rambur, Byers 1930)

1, (2, Tennesen), 4, (7, Walker 1952), 8, 9, 10, 11, 12, 14, 15, 16, 17, 19, 20, 21, 25, 26, 28, 32, (33, Byers 1930), 35, 43, (44, 45, Walker 1952)

Common at grassy temporary ponds south to Orange Co., and according to Walker (1952), Pinellas Co.

Flight season 16 March through winter to 15 Jan.

##### [6] LESTES INAEQUALIS Walsh 1862

19, 24, 32

Rare at permanent ponds and slow streams in Florida south only to Alachua Co.

Flight season 13 April - 8 Aug.

##### [7] LESTES RECTANGULARIS Say 1839

(4, Wright 1943), 28, 30, 32, (34, Tennesen)

Not listed by Byers (1930), but Byers collected a female in 1924 that was misidentified as *L. vidua* in the FSCA.

Scarce at temporary forest pools, south only to Levy Co.

Flight season 16 April - 5 Nov, but there are no records for June, July and August.

##### [8] LESTES SPUMARIUS Hagen in Selys 1862

Keys

Known only from the Florida Keys in the U.S.

Flight season 7 July through the winter to 26 April.

##### [9] LESTES TENUATUS Rambur 1842

67

Known only from Dade Co. in the U.S.

Flight season 27 Aug through the winter to 31 May.

##### [10] LESTES VIDUA Hagen 1861

8, 11, 13, 14, (19, 20, Tennesen), 21, 28, 32, 33, 35, 39, 43, 44, 52, 59, 64

Uncommon in temporary grassy ponds south to Collier Co.

Flight season 20 Feb - 8 Dec.

##### [11] LESTES VIGILAX Hagen in Selys 1862

1, 2, (4, Wright 1943), 6, 9, 10, 11, 12, 13, 14, (16, Neal & Whitcomb 1972), (19, Tennesen), 20, 21, 24, 25, 26, 27, 28, 32, 33, 34, (35, Byers 1930), 39, 40, 43, 44, 52, 65

Common in swampy waters south to Broward Co.

Flight season 20 March - Dec 16.

#### COENAGRIONIDAE

##### [12] ARGIA APICALIS (Say 1839)

1, (2, Johnson 1972), 5, 6, 8, (9, Johnson 1972), 11, 12, (13, Johnson 1972), 15, (17, Johnson 1972), 18, 19, 24, (28, Tennesen), (31, Johnson 1972), 32

Common on the larger rivers south to the Suwannee river, and rarely to its tributary the Santa Fe River at the northern edge of Alachua Co. Some specimens from Leon Co. eastward

have prominent black humeral stripes, as discussed by Johnson (1972).

Flight season 12 April - 22 Aug.

##### [13] ARGIA BIPUNCTULATA (Hagen 1861)

1, 2, (3, Wright 1943), 4, 7, 9, (11, Neal & Whitcomb 1972), 12, 14, 20, 27, 28, 32, 33, 35, 39, 40, 43, 44

Scarce at seepage areas south to Orange Co.

Flight season 3 March - 17 Aug.

##### [14] ARGIA FUMIPENNIS (Burmeister 1839)

1, 2, 3, 4, (5, Gloyd 1968), 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, (17, 18, Gloyd 1968), 19, 20, 21, 22, 24, 26, 27, 28, 32, 33, 34, 35, 37, 38, 39, 40, 41, (42, Gloyd 1968), 43, 44, 45, 46, 47, 48, 50, 51, 52, (53, 55, Gloyd 1968), 56, 57, 58, 59, (60, Gloyd 1968), 61, 62, 63

Common at both flowing and still waters. The subspecies *A. f. fumipennis* occurs south only to the Suwannee River. Gloyd (1968) described the subspecies *A. f. atra* which is endemic to the rest of the Florida Peninsula south to Hendry Co.

Flight season all year.

##### [15] ARGIA MOESTA (Hagen 1861)

1, 2, 4, 5, 8, 9, 11, 12, 17, 18, 19, 20, 21, 22, (24, Kiauta & Kiauta 1980), 25, 26, 28, 32, 34, 35, 37, 38, 42, 46, 47, (50, Shiffer), 51, 52, 57, (58, Johnson & Westfall 1970)

Common at streams and rivers south to Highlands Co., and recorded from Charlotte Co. by Johnson & Westfall (1970).

Flight season 27 March - 15 Nov.

##### [16] ARGIA SEDULA (Hagen 1861)

5, 8, 9, (10, Tennesen), 11, 12, 15, 16, 18, 19, 22, 24, 25, 26, 31, 32, 34, 35, 37, 38, 39, 40, 43, 44, 45, 46, 47, (50, Shiffer), 51, 52, 53, 54, 56, 57, 59, 61, 62, 63, (64, Johnson & Westfall 1970)

Strangely, Byers (1930) did not find this species in Alachua Co. or southward, but there are specimens in the USNM collected in Lee and Hendry Cos. in 1921. The species is now common on streams and rivers south to Hendry Co., and according to Johnson & Westfall (1970), to Collier Co.

Flight season all year.

##### [17] ARGIA TIBIALIS (Rambur 1842)

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 19, 20, 21, 25, 26, 27, 28, 32, 33, 34, 35, 43, 47

Common on streams south to Polk Co.

Flight season 3 March - 26 Oct.

##### [18] ENALLAGMA BASIDENS Calvert 1902

8, 11, 12

Rare in the Panhandle at still waters, particularly slow parts of spring-fed streams.

Flight season 22 May - 28 Sept.

##### [19] ENALLAGMA CIVILE (Hagen 1861)

1, 2, (4, Wright 1943), 8, 11, 12, 16, (28, Shiffer), 30, 32, (40, Wright 1944a), (44, Daigle 1978), 45, 47, 67

Uncommon, but now found throughout mainland Florida at any lentic waters, especially newly created ponds.

Flight season all year.

##### [20] ENALLAGMA COECUM (Hagen 1861)

(*E. cardenium* Selys, Byers 1930)

1, 8, 9, 15, 16, 18, 19, 21, 24, 26, 27, 28, 31, 32, 34, 35, 37, 38, (40, Williamson 1922a), 42, 43, 44, (45, Williamson 1922a, and Byers 1930), 47, 48, (50, Shiffer), 51, 52, 56, 57, 59, 61, (62, 67, Williamson 1922a)

Common at flowing waters throughout mainland Florida, except rare south of Lake Okeechobee.  
Flight season all year.

[21] *ENALLAGMA CONCISUM* Williamson 1922

2, 7, 9, (10, Byers 1930), 14, 21, 26, 28, 32, 33, 34, 43, 44, 49, (52, Needham 1946, and Frost 1964)

Type locality Volusia Co., Enterprise, Buckeye Homestead Pond.

Uncommon at oligotrophic lakes and ponds south to Brevard Co., and according to Needham (1946) and Frost (1964) to Highlands Co.

Flight season 6 Feb - 23 Dec.

[22] *ENALLAGMA DAECKII* (Calvert 1903)

2, (4, Wright 1943), 9, 11, 14, 19, 20, 21, 28, 32, 33, 52

The type series was from Volusia Co., Enterprise; and Manumuskin, New Jersey. The species was transferred from *Telagrion* to *Enallagma* by Byers (1927).

Uncommon at shady, swampy waters south to Highlands Co.

Flight season 6 April - 11 Sept.

[23] *ENALLAGMA DAVISI* Westfall 1943

2, 10, 12, 14, 28, 32, 33, 35, 43

Type locality Seminole Co., 5 mi N of Winter Park.

Uncommon at sand-bottomed lakes. The type locality is still the known southern end of the species' range.

Flight season 23 Jan - 12 April.

[24] *ENALLAGMA DIVAGANS* Selys 1876

1, 2, 3, 6, 8, 10, 12, 16, (28, Shiffer), 32

Uncommon, mostly at slowly flowing waters, south only to Alachua Co.

Recorded flight season 3 May - 16 May.

[25] *ENALLAGMA DOUBLEDAYI* (Selys 1850)

1, 2, 6, 8, 10, 11, 12, 14, 16, 19, 20, 21, 22, 25, (27, Hagen 1861), 28, 30, 32, 33, 34, 35, (38, Tennessen), 39, 40, 43, 44, 45, (50, Shiffer), 52, 59, 64, 65

Type locality "Florida."

Common at ponds south to Broward Co.

Flight season all year.

[26] *ENALLAGMA DUBIUM* Root 1924

2, 9, 10, 11, 12, 14, 21, 26, 32, 33

Uncommon at swampy still waters south only to Alachua Co.

Flight season 20 March - 11 Sept.

[27] *ENALLAGMA DURUM* (Hagen 1861)

13, (15, Shiffer), (20, Byers 1931a), 28, 32, 39, 40, 43, 44, 48, 52, 59, 60, (62, Williamson 1922a), 63

Type series was from "Florida, Louisiana, Maryland."

Uncommon at fertile or brackish lakes south to Palm Beach Co.

Flight season probably all year, not recorded January.

[28] *ENALLAGMA GEMINATUM* Kellicott 1895

2, 8, 9, (10, Tennessen), (12, Byers 1927), 14, (19, Tennessen), 27, 32, 34, 35

Scarce at swampy waters, south only to Marion Co.

Flight season 23 Feb - 18 Oct.

[29] *ENALLAGMA PALLIDUM* Root 1923

10, 11, 14, (16, Shiffer), 19, 21, (28, Shiffer), 32, 38, 43, 44

Scarce at swampy lakes south to Orange Co.

Flight season 6 April - 30 Aug.

Type locality Dade Co., north Miami Beach, Haulover.

[30] *ENALLAGMA POLLUTUM* (Hagen 1861)

(10, Byers 1927, and 1930), 14, 15, 16, 21, 26, 27, 28, 32, (33, Byers 1930), 34, 35, 38, 39, 40, 43, 44, (45, Shiffer), 46, 48, (50, Shiffer), 51, 52, 53, 56, 59, 61, (62, Williamson 1922a), 63, 65, 66, 67

Type locality "Florida."

Common at mesotrophic still waters throughout the Florida Peninsula, but has not been found west of Gulf Co. in the Panhandle.

Flight season all year.

[31] *ENALLAGMA SIGNATUM* (Hagen 1861)

1, 2, 8, 9, 10, 11, 12, 14, 15, 19, 21, (28, Shiffer), 32, (40, Williamson 1922a), 43, 44, 48, 52, (61, Williamson 1922a)

Not as common as *E. pollutum* and found at similar habitats, but found further west in the Panhandle and not as far south in the Peninsula, south to Highlands Co., or according to Williamson (1922a), to Lee Co.

Flight season all year.

[32] *ENALLAGMA SULCATUM* Williamson 1922

(2, Tennessen), 10, 12, 14, 26, 28, 32, 33, 34, 40, 43, 44, 52

Type locality Volusia Co., Enterprise.

Fairly common at sand-bottomed lakes south to Highlands Co.

Flight season 25 Feb - 15 Nov.

[33] *ENALLAGMA VESPERUM* Calvert 1919

(as both *E. vesperum* and *E. laurenti* Calvert, Byers 1930)

2, 10, 11, 24, 26, 28, 32, (33, Tennessen), 43, 44, 47, 49, (52, Needham 1949), 59

Uncommon at lakes south to Glades Co.

Flight season 25 Feb - 7 Nov.

[34] *ENALLAGMA WEEWA* Byers 1927

(*E. exsulans* (Hagen), Williamson 1922a)

1, 2, 3, 4, 6, 9, 10, 11, 12, 14, 16, 21, 27, 28, 32, 35, (40, Williamson 1922a), 43, 44, 48, 52, 59

Type locality Gulf Co., Chipola Lake.

Common at swampy streams south to Glades Co.

Flight season 25 Feb - 7 Nov.

[35] *ISCHNURA (ANOMALAGRION) HASTATA* (Say 1839)

(2, Tennessen), 3, (4, Wright 1943), 9, 10, 11, 12, 13, 14, 16, 27, 28, 29, 32, 33, 34, 35, 37, 38, 40, 41, (42, Neal & Whitcomb 1972), 43, 44, 45, 46, 47, 48, 50, 52, 53, 56, 57, 58, 60, 61, 62, 67, Keys, Dry Tortugas

Abundant at marshy waters throughout Florida.  
Flight season all year.

- [36] *ISCHNURA KELLICOTTI* Williamson 1898  
8, 14, 28, 32, 33, 34, 35, 43, 44, (52, Johnson & Westfall 1970), 67

Fairly common throughout mainland Florida in association with water lilies.

Flight season 3 Feb - 16 Dec. (no July records).

- [37] *ISCHNURA POSITA* Hagen 1861  
2, 3, (4, Wright 1943), 8, 10, 11, 12, 14, 15, 16, 17, 20, 21, 24, 25, 27, 28, 32, 33, 35, 38, 39, (40, Wright 1944a), 41, 42, 43, 44, 46, 47, 48, 52, 56, 59, 62, 63, 64, 65, 67

Abundant at marshy waters throughout mainland Florida.

Flight season all year.

- [38] *ISCHNURA PROGATA* Hagen 1861  
12, 14, 20, 21, 25, 28, 32, (35, Byers 1930), 38, 44, (45, Shiffer), 48, (50, Shiffer), 52, 59, 67

A scarce inhabitant of shady seepage areas throughout Peninsular Florida, but it has not been found west of the Apalachicola River in the Panhandle.

Flight season probably all year, not recorded January.

- [39] *ISCHNURA RAMBURII* (Selys 1850)  
(as both *I. ramburii* and *I. credula* Hagen, Byers 1930)

Keys, Dry Tortugas, and all counties except 3, 4, 5, 6, 17, 20, 23, 24, 26, 31, 41, 55

Abundant at lentic waters throughout Florida.

Flight season all year.

- [40] *NEHALENNIA GRACILIS* Morse, 1895  
24, 32

Rare, habitat uncertain in Florida, but not found at bogs which are its typical habitat in northern North America.

Flight season recorded is 28 April - 18 May.

- [41] *NEHALENNIA INTEGRICOLLIS* Calvert 1913  
1, 2, (4, Wright 1943), 8, 9, 11, 12, 14, 15, (16, Neal & Whitcomb 1972), 17, 20, 21, 24, 28, 32, 33, 34, 35, 40, 43, 44, 46, (48, Byers 1930), 50, 52, 59, 63, 64

The type locality for the female holotype is Volusia Co., Enterprise. The type series of *N. irene* Hagen was from "Chicago; Florida; Illinois; Maine; New Jersey; Wisconsin" and thus probably includes specimens of *N. integricollis*.

Fairly common at lentic waters south to Collier Co.

Flight season 3 March - 21 Nov.

- [42] *NEHALENNIA PALLIDULA* Calvert 1913  
(as both *N. pallidula* and *Argiallagma minutum*, Byers 1930)

34, 43, (44, Daigle 1978), 47, 59, 64, 67

Type locality Dade Co., north Miami Beach, Haulover.

The only Zygopteran endemic to Florida. De Marmels (1984) sunk the genus *Argiallagma* and transferred *pallidula* to *Nehalennia*. According to De Marmels' phylogenetic analysis, *N. pallidula* is a relict offshoot from a *N. minuta* (Selys)-like ancestor early in the evolution of the genus. The genus then spread, speciating as it did so, through North America to Europe to Asia.

This species is apparently most common in the Everglades, but it has rarely been found in recent years.

Flight season all year.

- [43] *NEOERYTHROMMA CULTELLATUM* (Hagen in Selys 1876)

(66, Tennessen), 67

This species is known only from ponds in Monroe and Dade Cos. in the U.S.

Flight season recorded is 15 March - 24 Dec.

- [44] *TELEBASIS BYERSI* Westfall 1957  
12, 14, 17, 32, 35, 37, 38, 39, 40, 44, 46, 48, (50, Shiffer), 52, (56, Shiffer), 59, 64

Type locality Alachua Co., Gainesville, Bivin's Arm (= Bivens Arm Lake).

Common at still-water, semi-shaded waters covered with duckweed or water fern south to Collier Co., but not recorded west of the Apalachicola River in the Panhandle.

Flight season probably all year, not recorded December.

## ANISOPTERA

### PETALURIDAE

- [45] *TACHOPTERYX THOREYI* (Hagen 1858)  
2, 3, 11, 12, (14, Cross 1956), 32

A very local species, recorded from scattered seepage areas south to Alachua Co. However, when I was starting to collect dragonflies in April, 1972, I saw several large dragonflies perching on tree trunks in Lake Co., which in retrospect could only have been *T. thoreyi*. The ecology and behavior of this species at Gainesville, Florida, were studied by Dunkle (1981).

Flight season 8 March - 19 June.

### AESHNIDAE

- [46] *ANAX AMAZILI* (Burmeister 1839)  
(12, Michael May), Dry Tortugas  
Probably only a vagrant to Florida, recorded in July.

- [47] *ANAX JUNIUS* (Drury 1770)  
2, 4, 7, 8, (9, Cross 1956, sight?), 11, (13, Cross 1951), 12, (13, Wright 1944b), 14, (15, Cross 1956, sight?), 16, 17, 22, 25, 26, 27, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, (40, Wright 1944a), 42, 43, 44, (45, Shiffer), 46, 47, 49, 50, 51, 52, (53, Paulson 1966), (54, Edman & Haeger, 1974), 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, Keys, Dry Tortugas

This common, strong-flying and migratory species can be expected anywhere in the state.

Flight season all year.

- [48] *ANAX LONGIPES* Hagen 1861  
(2, Cross 1956 sight), 9, 11, 12, 14, (15, Cross 1956, sight), 16, 19, 26, 28, (31, Dunkle sight), 32, 33, 34, (35, Dunkle sight), 40, 43, 44, (47, Paulson 1966, sight), 52, (57, 59, Paulson 1966, sight), (67, Hagen 1890b, and Paulson 1966, sight)

Uncommon at semi-permanent ponds throughout mainland Florida. Paulson (1966) thought it was probably a vagrant south of Lake Okeechobee.

Flight season 23 Feb - 23 Nov.



- [49] **BASIAESCHNA JANATA** (Say 1839)  
2, 4, 6, 9, 10  
Uncommon on streams in the western Panhandle.  
Flight season 13 March - 10 April.
- [50] **BOYERIA VINOSA** (Say 1839)  
2, 6, 8, 9, 11, 12, 17, 26, 28, 32, 33, 34, 35, (44, Daigle 1978), 51  
Common on streams south to Hardee Co.  
Flight season 11 May - 4 Dec.
- [51] **CORYPHAESCHNA ADNEXA** (Hagen 1861)  
47, (50, Shiffer), 59, 64, 65, 67  
Found only in southern Florida in the U.S., where it is scarce at weedy lakes and canals.  
Flight season probably all year.
- [52] **CORYPHAESCHNA INGENS** (Rambur 1842)  
2, 3, 7, 9, 10, (11, Neal & Whitcomb 1972), 12, (14, Cross 1956), 16, 17, 19, 25, 26, 27, 28, 29, 31, 32, 33, 34, 39, (40, Hagen 1861, and Wright 1944a), 43, 44, 48, 49, (50, Shiffer), 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, Keys, Dry Tortugas  
Common at densely vegetated lentic waters throughout Florida.  
Flight season 6 Feb - 19 Oct.
- [53] **CORYPHAESCHNA VIRIDITAS** Calvert 1952  
67, Keys, Dry Tortugas  
Known in the U.S. only from southern Florida, where it is rare at ponds and canals.  
Flight season 19 March - 10 Aug.
- [54] **EPIAESCHNA HEROS** (Fabricius 1798)  
2, 3, 9, 10, 11, 12, 13, 14, 16, 17, 19, 22, 24, 25, 26, 28, 29, 30, 32, 33, 34, 35, (40, 43, Hagen 1861), 44, (50, Shiffer), 52  
Common at swampy habitats south to Highlands Co.  
Flight season 27 Feb - 1 Nov.
- [55] **GOMPHAESCHNA ANTILOPE** (Hagen 1874)  
2, 3, 9, 11, 12, 13, 14, 16, 17, 18, 20, 21, 29, 32, 35, 40, 43, 44, 52, (59, Needham 1946)  
This species was often confused with *G. furcillata* until Gloyd's 1940 publication.  
Rare at swampy habitats south to Highlands Co., or according to Needham (1946), Glades Co.  
Flight season 13 Jan - 9 June.
- [56] **GOMPHAESCHNA FURCILLATA** (Say 1839)  
2, 4, 12, (13, Shiffer), 14, (15, Knopf 1977), 16, 18, 19, 20, 23, 26, 28, 32, 34, 44  
Uncommon south to Orange Co. at bogs and swamps.  
Flight season 8 Jan - 22 April.
- [57] **GYNACANTHA NERVOSA** Rambur 1842  
(13, 14, Cross 1956), (15, Timothy Vogt), 21, 26, 27, 28, (29, Calvert 1901), 32, 33, 34, 35, 39, 42, 43, 44, (45, Williamson 1923), 46, 47, 51, 52, 55, 56, 57, (58, Williamson 1923), 59, 60, 61, 62, 64, 65, 66, 67, Keys  
Common at temporary ponds throughout the Florida Peninsula, but scarce in the Panhandle; it has not been found west of the Apalachicola River.  
Flight season all year.
- [58] **NASIAESCHNA PENTACANTHA** (Rambur 1842)  
(1, Wurtz & Roback 1955, larva), 2, 9, 10, 12, 15, 16, 17, 19, 20, 24, 25, 26, 32, 33, 34, 35, 38, 39, 44, (50, Shiffer), 51, 52, (53, 58, Paulson 1966, larvae) (56, Needham 1945a, larva?), 59, 64, (66, Paulson 1966, larva), 67  
Common throughout the Florida mainland at swampy waters.  
Flight season 2 March - 28 Dec.
- [59] **TRIACANTHAGYNA TRIFIDA** (Rambur 1842)  
16, 19, 20, 21, 25, 26, 27, 28, (29, Calvert 1901, and Williamson 1923), 30, 32, 33, 35, 36, 41, 42, 43, 44, 46, 47, 50, 52, 57, 59, 63, 64, 65, 66, 67, Keys, Dry Tortugas  
Common at temporary forest pools in the Florida Peninsula.  
Flight season 10 July through the winter to 15 Feb.
- GOMPHIDAE**
- [60] **APHYLLA WILLIAMSONI** (Gloyd 1936)  
(*Negomphoides ambigua* (Selys), Byers 1930)  
(1, Wurtz & Roback 1955, larva), 2, 8, 10, 11, (12, Byers 1934), 13, 14, (15, Cross 1956, larva), 17, 19, 20, 22, 24, 25, 26, 28, 29, 32, 33, 34, 35, (36, Hagen 1885, larva), (39, Gloyd 1936), (40, Donnelly), 43, 44, 45, 46, 47, 52, 56, 57, 58, 59, 62, 65, 67  
Type locality Madison Co., Logan Lake.  
Common at lentic waters throughout mainland Florida.  
Flight season 7 April - 7 Nov.
- [61] **ARIGOMPHUS PALLIDUS** (Rambur 1842)  
(*Gomphus pallidus*, Byers 1930)  
9, 12, 14, 16, 17, 19, 20, 21, 23, 24, 25, 26, 27, (28, Shiffer), 29, 30, 32, 34, 35, 39, 43, 44, (45, Williamson 1914), 46, 47, 48, (50, Shiffer), 51, 52, 53, 56, 59, 64, 67  
Common at lentic habitats in the Florida mainland, except that its range abruptly and inexplicably stops at the western Panhandle.  
Flight season 20 March - 11 Oct.
- [62] **DROMOGOMPHUS ARMATUS** Selys 1854  
2, 3, 4, 9, 12, 19, 28, 32, 44  
This species was often confused with other *Dromogomphus* until the paper by Westfall & Tennessen (1979). The earliest record for Florida in the FSCA is 1950, published by Westfall (1953b) as *D. spoliatus* (Hagen in Selys) and redetermined as *armatus* by Westfall & Tennessen (1979). However, Byers recorded *D. armatus* in 1936. The latter determination is presumably correct since Byer's identifications of *D. spinosus* in the FSCA, done in 1935, are correct.  
*D. armatus* occurs south to Orange Co. It is rare because its preferred habitat, clear water flowing over deep muck, is rare.  
Flight season 9 June - 20 Nov.
- [63] **DROMOGOMPHUS SPINOSUS** Selys 1854  
6, 9, 16, 17, 19, 25, 26, 28, 31, 32, 35, 38, 39, (42, Paulson 1966), 43, 44, (46, Paulson 1966), 57  
As discussed under *D. armatus*, Cross's (1956) 2 male specimens from Gadsden and Leon Cos. should be re-examined.

Common at lotic waters south to DeSoto Co.  
Flight season 14 April - 11 Nov.

[64] **ERPETO GOMPHUS DESIGNATUS** Hagen 1858  
11, 12

Known in Florida only from the Apalachicola River, where it has been very rare since the closing of the Jim Woodruff Dam in 1957. However, its population appears to be recovering, as J. Daigle collected 2 specimens in 1988, and more in 1991.

Flight season 1 June - 9 Aug.

[65] **GOMPHUS (GOMPHURUS) DILATATUS**  
Rambur 1842

1, 2, 3, 6, 7, 8, 9, 11, 12, 14, 16, 17, 19, 24, 25, 26, 28, 31, 32, 33, 34, 35, 42, 43, 44, 47, (48, Calvert 1921), 50, 52, 57, 59

This species is a common inhabitant of lotic waters south to Glades Co.

Flight season 3 March - 27 Aug.

[66] **GOMPHUS (GOMPHURUS) HYBRIDUS**  
Williamson 1902

11, 12

Known in Florida only from the Apalachicola River before the Jim Woodruff Dam was closed in 1957.

Flight season recorded is 20 March - 3 April.

[67] **GOMPHUS (GOMPHURUS) MODESTUS**  
Needham 1942

3

This species has been collected only once in Florida, on the Yellow River in Okaloosa Co. on 4 June 1973 by C. Cook.

[68] **GOMPHUS (GOMPHURUS) VASTUS** Walsh  
1862

11, 12

Known in Florida only from the Apalachicola River.  
Flight season recorded is 13 - 29 June.

[69] **GOMPHUS (GOMPHUS) GEMINATUS** Carle  
1979

1, 2, 3, 4, 9, 11, 12

Type locality Santa Rosa Co., Pond Creek at Route 191.

Endemic to the Florida Panhandle and adjacent Alabama and Georgia. Specimens from Gadsden and Liberty Cos., on the east side of the Apalachicola River, are considerably larger than any others.

This taxon might be a subspecies of *G. parvidens* Currie.

Flight season 3 March - 12 June.

[70] **GOMPHUS (PHANOGOMPHUS) AUSTRALIS**  
(Needham 1897)

2, 8, 10, 13, 14, 15, 24, 28, 32, 33, 43, 44, (50, Needham 1946, and Westfall 1950)

Type locality Orange Co., Gotha.

Uncommon at sand-bottomed lakes south to Orange Co., or according to Needham (1946) and Westfall (1950), to Highlands Co.

Flight season early and brief, 14 March - 27 April.

[71] **GOMPHUS (PHANOGOMPHUS) CAVILLARIS**  
Needham 1902

2, 4, 12, 14, 15, 19, 20, 23, 24, 26, 28, 32, 33, 34, 35, 40, 43, 44, (45, Needham 1950), 47, 52, 60

Type locality Seminole Co., Fort Reed.

Two subspecies occur in Florida, *G. cavillaris brimleyi* Muttkowski in the Panhandle, and *G. cavillaris cavillaris* which is endemic to the Florida Peninsula. The species has otherwise been found only at certain North Carolina lakes.

Common at sand-bottomed lakes south to Martin Co.

Flight season 20 Jan - 24 May.

[72] **GOMPHUS (PHANOGOMPHUS) EXILIS** Selys  
1854

3, 6

This species of the western Panhandle and the similar *G. minutus* in the rest of Florida may competitively exclude each other, since their ranges are parapatric in Florida. The only place where I have seen these species together is on the lower Savannah River in extreme SE South Carolina.

Flight season 11 April - 30 May.

[73] **GOMPHUS (PHANOGOMPHUS) HODGESI**  
Needham 1950

2, 3, 4, 9, 10, 14, 16

An uncommon species of Panhandle streams.

Flight season 15 March - 26 May.

[74] **GOMPHUS (PHANOGOMPHUS) LIVIDUS** Selys  
1854

3, 4, 8, 9, 11, 12, 14

Fairly common at Panhandle streams.

Flight season 18 March - 6 May.

[75] **GOMPHUS (PHANOGOMPHUS) MINUTUS**  
Rambur 1842

8, 9, 10, 11, 12, 14, 15, 16, 17, 19, 21, 22, 23, 24, 25, 26, 27, 28, 31, 32, 34, 35, 39, (40, Castle & Laurent 1896), 43, 44, 45, 47, 48, (50, Shiffer), 52, 53, 56, 57, 58, 59, 61, 62

Some specimens from the Panhandle are blacker than those from the Peninsula, and might constitute a subspecies, as in the case of *G. cavillaris brimleyi*. As mentioned above, *G. minutus* is separated from *G. exilis* by range in Florida; it is separated from *G. cavillaris* ecologically because it prefers more eutrophic lakes. However, at ecologically intermediate lakes in Alachua Co., both *cavillaris* and *minutus* occur and apparent hybrids between them have been collected.

*G. minutus* is common at mesotrophic lentic or lotic waters south to Lee Co., except that it is absent from the western Panhandle.

Flight season 14 Feb - 25 May.

[76] **GOMPHUS (PHANOGOMPHUS) WESTFALLI**  
Carle & May, 1987

2

Type locality Santa Rosa Co., Ates Creek at Carr Lake Dam.

Endemic, so far as known, to Santa Rosa Co. This taxon might be a subspecies of *G. diminutus* Needham of the Carolinas, but intermediates have not been found in Georgia.

Flight season 13 March - 12 April.

## [77] HAGENIUS BREVISTYLUS Selys 1854

2, (9, Cross 1956), 12, (15, 16, Cross 1956), 19, 24, 26, (31, Tennessen), 32, 35, 44, (50, Shiffer), (52, Needham 1946, larva)

A common inhabitant of lotic waters south to Orange Co., and

according to Needham (1946), to Highlands Co.

Flight season 16 April - 8 Nov.

## [78] PROGOMPHUS ALACHUENSIS Byers 1939

20, 25, 26, 28, 32, 33, 34, (39, Byers 1939), 40, 43, 44, 47, 50, 51, 52, (56, Needham 1945b), 57, 59

Type locality Alachua Co., Newnans Lake.

Prior to its description, this species was confused with *P. obscurus*.

Endemic to sand-bottomed lakes of the Florida Peninsula, but common within this range.

Flight season 10 April - 30 Aug.

## [79] PROGOMPHUS BELLEI Knopf &amp; Tennessen 1980

2, 9, 10, 11, 12, 14, 15

Type locality Calhoun Co., Juniper Creek at Route 20.

This taxon is closely related to *P. alachuensis*, and might be a subspecies of it in a manner similar to that of Panhandle vs. Peninsula populations of *Gomphus cavillaris* and *G. minutus*. The Alabama record for *P. bellei* by Bick (1983) was a misidentified *P. obscurus*; the only place the species has been found outside Florida is White Lake in North Carolina, giving it a distribution similar to that of *Gomphus cavillaris brimleyi*.

Flight season 9 May - 13 Aug.

## [80] PROGOMPHUS OBSCURUS (Rambur 1842)

(*Gomphoides obscura* (Rambur), Byers 1930)

1, 2, 3, 4, 7, 8, 9, 11, 12, 16, 17, 25, 26, 28, 32, 33

Cross's (1956) record from Leon Co. needs confirmation, as it could have been *P. bellei*.

The geographic range of *P. obscurus* overlaps all of that of *P. bellei*, and part of that of *P. alachuensis*, but south only to Alachua Co. The southern limit of *P. obscurus* is probably temperature dependent. I have never seen *P. obscurus* on a lake in Florida, but the species does occur on sand-bottomed lakes in the north, for example in Michigan. In the Panhandle, *P. bellei* inhabits small sandy trickles and sand-bottomed lakes, *P. obscurus* inhabits larger streams only; in the northern Peninsula *P. alachuensis* inhabits sand-bottomed lakes, *P. obscurus* inhabits any size stream. Paulson (1966) states that *P. alachuensis* occurs on both streams and lakes south of the range of *P. obscurus*.

Flight season 2 April - 7 Aug.

## [81] STYLURUS IVAE Williamson 1932

4, 11, 12, 14, 19, 24, 25, 26, 28, 32, 33

Uncommon on sand-bottomed streams, south only to Alachua Co.

Flight season begins later than any other Florida dragonfly, 1 Sept - 19 Nov.

## [82] STYLURUS LAURAE Williamson 1932

4, 11, 12

A scarce dragonfly of Panhandle streams.

Flight season 27 May - 8 Aug.

## [83] STYLURUS PLAGIATUS (Selys 1854)

(*Gomphus plagiatus*, Byers 1930)

2, 3, 8, 9, 10, 11, 12, 14, (15, Cross 1956), 16, 17, 19, 24, 25, 26, 31, 32, 33, 35, 39, 43, 44, 47, 51, 52, 56, 57, 63

Commonly inhabits streams and lakes south to Palm Beach Co.

Flight season 21 April - 1 Dec.

## [84] STYLURUS POTULENTUS Needham 1942

2, 3, 9

A scarce dragonfly of western Panhandle streams.

Flight season 16 May - 6 Aug.

## [85] STYLURUS TOWNESI Gloyd 1936

2, 3

Known in Florida only from the Blackwater River system.

Flight season 9 June - 26 Sept.

## CORDULEGASTRIDAE

## [86] CORDULEGASTER MACULATA Selys 1854

2, (11, Cross 1956), 12, 14, 32

Uncommon on forest streams south only to Alachua Co.

Flight season early and brief, 22 Feb - 19 April. The Byers (1942) record of 12 Aug 1940 is completely anomalous.

## [87] CORDULEGASTER OBLIQUA (Say 1839)

(*Taeniogaster fasciatus* (Rambur), Byers 1930)

9, 12, 17, 32

The taxonomic status of *C. fasciata* is unclear; it might be a subspecies or a clinal form.

This rare species of small forest streams is found south only to Alachua Co.

Flight season much later than other Florida *Cordulegaster*, 25 May - 23 July.

## [88] CORDULEGASTER SAYI Selys 1854

2, 12, 19, 28, 32

This rare species of seepage trickles has a restricted range extending from north Florida to central Georgia. The earliest Florida record in the FSCA is pieces of an adult male in alcohol labelled "Lake City, 1896, Lot 178/188."

Flight season begins a few days later than for *C. maculata*, but is equally short, 27 Feb - 22 April.

## MACROMIIDAE

## [89] DIDYMOPS FLORIDENSIS Davis 1921

2, 8, 12, 14, 15, 19, 20, 26, 28, 32, 33, 35, 43, 44, 47, (52, Needham 1946, and Paulson 1966), (56, Needham 1945b)

Type locality Polk Co., Lakeland.

Endemic and common at Florida sand-bottomed lakes in both Panhandle and Peninsula. Several specimens in the FSCA were taken in Malaise flight traps set in open pine forest far from water.

Flight season 20 Jan - 3 May.



[90] *DIDYMOPS TRANSVERSA* (Say 1839)

2, 3, 4, (8, Byers 1930), 9, 10, 11, 12, (13, Shiffer), 14, 15, 16, 17, 18, 25, 26, 32

Common, but south only to Alachua Co. This is normally a stream species in Florida, but in Wakulla Co. I found it flying with *D. floridensis* at the same lake, and some specimens appear to be hybrids.

Flight season 25 Jan - 11 May.

[91] *MACROMIA ALLEGHANIENSIS* Williamson 1909

2

Known in Florida only from 1 reared male and 2 emerging specimens taken 16 May 1973 by M. Westfall, Jr.

[92] *MACROMIA GEORGINA* (Selys 1878)

2, 3, 7, 9, 11, 12, 14, 16, 17, 19, 20, 26, 31, 32, (41, Shiffer), (44, Daigle 1978), (47, Paulson 1966), 48, (50, Shiffer), 51, 57

This species was not listed by Byers (1930), but the earliest specimens in the FSCA were taken by Byers in 1930.

Common on streams south to DeSoto Co.

Flight season 7 March - 9 Nov.

[93] *MACROMIA TAENIOLATA* Rambur 1842

6, 7, 8, (9, Cross 1956), 11, 12, 13, 14, 15, 16, 17, 18, 19, 25, 26, 32, 33, 35, 37, 38, 42, 43, 44, 47, 48, (50, Shiffer), 52, 53, 57, 59

A common dragonfly of streams, and sometimes lakes, south to Glades Co.

Flight season 14 April - 23 Nov.

## CORDULIIDAE

[94] *EPITHECA (EPICORDULIA) PRINCEPS* Hagen 1861

(*Epicordulia regina* Selys, Byers 1930)

8, (9, Cross 1956), 10, (14, 15, Cross 1956), 16, 17, 19, 21, 23, 24, 25, 26, 31, 32, 33, 34, 35, 38, (40, Davis 1922), 42, 43, 44, 46, (47, Shiffer), 50, 51, 52, 53, 57, 59, 62, 63, 67

Common at both lentic and lotic waters throughout mainland Florida.

Flight season 15 March - 3 Dec.

[95] *EPITHECA (TETRAGONEURIA) COSTALIS* (Selys 1871)

1, 2, 4, 5, 6, 10, 11, 12, 13, 14, (15, Knopf 1977), 16, 17, 19, 20, 23, 24, 25, 26, 28, 31, 32, 33, 34, 35, 44

This species was confused with other *Epithec*a until Tennessen's (1977) paper. The earliest record in the FSCA for Florida was collected by Byers in 1924 and determined as *Tetragoneuria stella*. Davis' (1933) record for Hillsborough Co. is doubtful.

Fairly common at sand-bottomed lakes south to Orange Co.

Flight season 20 Jan - 18 April.

[96] *EPITHECA (TETRAGONEURIA) CYNOSURA* (Say 1839)

(*Tetragoneuria semiaquea*, Byers 1930)

1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, (22, Knopf 1977), 23, 24, 25, 26, 27, 28, (29, Tennessen 1973), 31, 32, 35, 38, 44, 48, 52, 53

Tennessen (1973) demonstrated that a female paratype of *E. petechialis* (Muttkowski) from Florida (possibly Volusia Co.) was in fact *E. cynosura*.

Common in lentic waters south to Highlands Co.

Flight season 8 Jan - 7 May, but at least on the Santa Fe River in Alachua Co. there is a second flight season from 3 October to the earliest frosts.

[97] *EPITHECA (TETRAGONEURIA) SEMIAQUEA* (Burmeister 1839)

28

This species was probably listed erroneously by Byers (1930), but C. Shiffer collected several specimens which appear to be the true *semiaquea* in Clay Co. near a sand-bottomed lake. Unfortunately lakes in that area were severely impacted by the drought of 1990 and are still mostly dry in 1991.

The only Florida specimens known were taken 3 April 1988.

[98] *EPITHECA (TETRAGONEURIA) SEPIA* (Gloyd 1933)

10, 11, 12, 14, 17, 19, 21, 26, 28, 32, 33, 34, 43, 44, 48, 52, 57, 59, 64, 67

Type locality Madison Co., 6 mi W of Greenville, Pettis Springs on the east side of the Aucilla River.

Common at lentic habitats throughout Florida, except the western Panhandle.

Flight season long, as in *E. princeps*, 3 March - 23 Nov.

[99] *EPITHECA (TETRAGONEURIA) SPINOSA* Hagen 1878

10

Known in Florida only from the Chipola Dead Lake swamp, Gulf Co. The species was first found in Florida in 1976, after the level of the lake had been raised by a small dam in 1960. This dam was removed in 1987, with additional removal of rocks in 1989 to restore the original Chipola River channel. *E. spinosa* has not been seen at this locale in the appropriate season since these changes have occurred, although plenty of swamp remains (J. Daigle pers. comm.).

Flight season perhaps the earliest of any dragonfly in its range, recorded 13 - 25 March.

[100] *EPITHECA (TETRAGONEURIA) STELLA* Williamson in Muttkowski 1911

(19, Muttkowski 1911), 32, 33, 35, 43, 44, (45, Davis 1933), 48, (49, Muttkowski 1911), 52, 53, 54, 55, 59, 60, (62, Paulson 1966), (63, Muttkowski 1911, and Paulson 1966), 64, 67

Type locality Palm Beach Co., West Palm Beach.

Apparently endemic to the Florida Peninsula. Byers' (1930) record from Gulf Co., and 1 male recorded by Cross (1956) from Leon Co. need confirmation.

Common at lentic habitats.

Flight season 2 Feb - 25 April.

[101] *HELOCORDULIA SELYSII* (Hagen in Selys 1878)

2, 3, 4, 10

Found in Florida only in the western Panhandle.

Flight season early and short, 11 March - 11 April.

[102] *NEUROCORDULIA ALABAMENSIS* Hodges in Needham & Westfall 1955

2, 3, 9, 28, 32, 43, 44, 48, 52

The type series was from Alabama, Florida, Georgia, and South Carolina.

Common, but rarely seen, on small forest streams south to Highlands Co.

Flight season 6 May - 2 Aug.

[103] *NEUROCORDULIA MOLESTA* (Walsh 1863)

9, 11, 12

Occurs on the large Panhandle rivers. The only adult specimens are from the Apalachicola river; males from there lack the trochanteral projection on the middle leg typical of northern *molesta*.

Flight season 15 June - 8 Aug.

[104] *NEUROCORDULIA OBSOLETA* (Say 1839)

32

Known in Florida only from 2 interconnected lakes in Alachua Co.; adult behavior has never been observed in Florida.

Flight season begins by 4 - 15 April.

[105] *NEUROCORDULIA VIRGINIENSIS* Davis 1927

(*Neurocordulia* sp., larva, Byers 1930)

3, (8, Byers 1936a, and Cross 1956), (10, Byers 1937), 11, (12, Cross 1956), 14, 16, 17, 18, 19, 24, 31, 32, 34, 35

Common on rivers south to Marion Co.

Flight season 18 March - 11 June.

[106] *SOMATOCHLORA CALVERTI* Williamson & Gloyd 1933

3, 11, 12, 13, 14

Type locality Liberty Co., 7 mi NE, 4 mi W Bristol.

The larval habitat of this species is unknown; it is probably boggy forest seepages. The species has been collected only in the Florida Panhandle and in South Carolina.

Flight season 11 June - 30 Aug.

[107] *SOMATOCHLORA FILOSA* (Hagen 1861)

1, 2, 3, 8, 9, 10, 11, 12, 13, 14, 19, 20, 23, 26, 32, 43, 44, (47, Walker 1925), 52

This uncommon species ranges south to Highlands Co., the furthest south of any North American *Somatochlora*. The larval habitat is unknown; adults have been seen near boggy forest trickles and sheet-flow swamp thickets.

Flight season 30 June - 21 Dec.

[108] *SOMATOCHLORA GEORGIANA* Walker 1925

3, 14

The larval habitat of this rare species has recently been discovered by J. Daigle. He found adults emerging from a vegetated part of a small forest stream in Leon Co.

Flight season 18 May - 3 Aug.

[109] *SOMATOCHLORA LINEARIS* (Hagen 1861)

3, 10, 11, 12, 13, 16, 17, 32, 43, 44

This uncommon species inhabits small forest streams south to Orange Co.

Flight season 11 May - 2 Sept.

[110] *SOMATOCHLORA PROVOCANS* Calvert 1903

11, 12

The female in the FSCA listed from Leon Co. by Westfall (1953b) and Cross (1956) was a misidentified *S. calverti*.

Flight season 31 June - 30 Aug.

[111] *SOMATOCHLORA TENEBROSA* (Say 1839)

11, 12, 14

Flight season 24 June - 10 Aug.

LIBELLULIDAE

[112] *BRACHYMESIA FURCATA* (Hagen 1861)

67, Keys

Calvert (1901) listed this species, as well as *Erythrodiplax umbrata* and *Tramea insularis*, from Seminole Co. These listings must have been a labelling error, because this county is too far north for all three species. According to Paulson (1966) the first likely Florida locality record for *B. furcata* was in the Keys, taken by R. B. Cumming in 1957.

Fairly common on ponds.

Flight season all year.

[113] *BRACHYMESIA GRAVIDA* (Calvert 1890)

7, 11, 13, 14, 15, 1, 6, 19, 23, 24, 26, 28, 29, 30, 32, 33, 34, (35, Calvert 1901), 36, 37, 38, 39, (40, Byers 1930, and Wright 1944a), 43, 44, 45, 47, 49, 50, 52, 53, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, Keys, Dry Tortugas

Type series was from [Pinellas Co.], Tarpon Springs; [Lee Co.], Ponto Passo; and Corpus Christi at the Nueces River, Texas.

Common at eutrophic lentic waters throughout Florida.

Flight season all year.

[114] *BRACHYMESIA HERBIDA* (Gundlach 1889)

Keys

Not a permanent Florida resident. Paulson (1964, 1966) recorded the only 3 specimens taken in Florida, on Big Pine Key in 1960-1961; the species was probably extirpated by the severe drought of 1961-1962. According to Paulson (1964), Needham's (1945a) Hendry Co. record referred to teneral *B. gravida*.

Flight season recorded 9 April - 14 Oct.

[115] *CELITHEMIS AMANDA* (Hagen 1861)

1, 2, 4, 6, 7, (8, Cross 1956), 9, 11, 12, 13, 14, 15, 20, 26, 27, 28, 32, 33, (34, Williamson 1922c), 35, 38, 39, 40, 41, 43, 44, (45, Williamson 1922c), 46, 47, 50, 51, 52, 56, 57

Fairly common at infertile ponds south to Highlands Co.

Flight season 15 May - 20 Nov.

[116] *CELITHEMIS BERTHA* Williamson 1922

2, 6, 7, 8, 12, 14, (17, Westfall 1952), 19, 25, 26, 28, 30, 32, 33, 34, 35, (40, Williamson 1922c, and Byers 1930), 43, 44, 46, 52, 57, 64, 67

Type locality Volusia Co., Enterprise, Buckeye Homestead Pond.

The "*leonora*" form, with a brown spot near the tip of one or more wings, occurs syntopically with clear-winged individuals in the Panhandle east to Madison Co. Some southern Florida males have basal wing spots as large as those of *C. ornata*.

- Common at infertile lakes throughout mainland Florida.  
Flight season 3 April - 20 Dec.
- [117] *CELITHEMIS ELISA* (Hagen 1861)  
2, 6, 8, 9, 11, 14, 16, 19, 24, 32  
This dragonfly is uncommon in Florida. It may have recently expanded its range into the state, using roadside borrow pits as habitats. The earliest records in the FSCA are for Santa Rosa Co. in 1955 and Alachua Co. in 1973.  
Flight season 12 April - 5 Oct.
- [118] *CELITHEMIS EPONINA* (Drury 1773)  
(1, Hagen 1861), 2, 5, 7, 8, 9, 10, 11, 12, (13, Cross 1956), 14, 15, 16, 20, 22, 23, 24, 25, 26, 28, 29, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, Keys, Dry Tortugas  
Common at lentic waters throughout the state.  
Flight season all year.
- [119] *CELITHEMIS FASCIATA* Kirby 1889  
2, 3, 6, 7, 9, 10, 11, 13, 14, 19, 20, 25, 27, 28, 29, 32, 33, 34, 38, (40, Hagen 1890a), 43, 44, 52, 65  
Fairly common at infertile lentic waters south to Broward Co.  
Flight season 8 April - 28 Oct.
- [120] *CELITHEMIS ORNATA* (Rambur 1842)  
2, 6, 7, 9, 10, 12, 13, 14, 15, 16, 17, 19, 20, 21, 23, 24, 25, 26, (27, Williamson 1922c), 28, 29, 30, 31, 32, 33, 34, 35, 39, 40, 43, 44, 45, 46, 47, 48, (49, Williamson 1922c), 50, 52, 53, 57, (60, Paulson 1966), 61, 63, 64, 65, 66  
Common at lentic habitats throughout the Florida mainland.  
Flight season all year.
- [121] *CELITHEMIS VERNA* Pritchard 1935  
4, 11, 14, 19, 32  
Scarce at infertile lakes and ponds south only to Alachua Co.  
Recorded Florida flight season is in April.
- [122] *CROCOTHEMIS SERVILIA* (Drury 1773)  
43, 47, 56, (58, Daigle & Rutter 1984), 59, 61, (62, Daigle & Rutter 1984), 63, 64, 65, 67  
This Asiatic species was accidentally introduced to Dade Co., where it was first found in 1975. It had spread north to Seminole Co. by 1986. The species is now common at lentic habitats in the southern half of the Florida Peninsula.  
Flight season all year.
- [123] *DYTHEMIS VELOX* Hagen 1861  
11  
Uncommon at reservoirs and slow-flowing waters; found so far only in Gadsden Co. in Florida.  
Flight season 27 May - 23 Sept.
- [124] *ERYTHEMIS PLEBEJA* (Burmeister 1839)  
43, 47, 61, 63, 64, 65, 67  
This species was first found in Dade Co. in 1971, and had slowly spread north to Seminole Co. by 1986.  
It is now fairly common at lentic habitats in the southern Peninsula.  
Flight season all year.
- [125] *ERYTHEMIS SIMPLICICOLLIS* (Say 1839)  
Recorded from the Keys (and Dry Tortugas, Paulson 1966), and all counties except 4, 27, 41, 54  
The most abundant dragonfly in Florida, found at nearly every lentic habitat.  
Flight season all year.
- [126] *ERYTHEMIS VESICULOSA* (Fabricius 1775)  
(*Lepthemis vesiculosa*, Byers 1930)  
(45, Shiffer), 61, 64, (65, Tennesen), 66, 67, Keys, Dry Tortugas  
Fairly common at lentic habitats in southern Florida.  
Flight season all year.
- [127] *ERYTHRODIPLAX BERENICE* (Drury 1770)  
1, 7, 13, 15, (21, Calvert 1912 and Shortess 1930), 22, 27, 29, 30, 34, 36, 37, 40, 41, 43, 46, 49, (52, Paulson 1966), 55, 56, 58, 61, 64, 66, 67, Keys, Dry Tortugas  
This is a common dragonfly of salt marshes wherever those occur along the Florida coast. The only inland record is for one specimen, circumstances unknown, from Highlands Co. (Paulson 1966). Keys populations show some venational differences and have been called the subspecies *naeva* Hagen.  
Flight season all year.
- [128] *ERYTHRODIPLAX CONNATA MINUSCULA* (Rambur 1842)  
(4, Borror 1942), (15, Cross 1956), (17, Byers 1930), (Keys, Borror 1942), and all other counties except 10, 21, 27, 49  
Some odonatologists give *minuscula* species status.  
Common at lentic waters throughout Florida.  
Flight season all year.
- [129] *ERYTHRODIPLAX UMBRATA* (Linnaeus 1758)  
(52, Needham 1951), 59, 64, 65, 66, 67, Keys, Dry Tortugas  
A misidentified teneral female in the FSCA collected by Byers in 1928 was the source of his (1930) record for *Dythemis rufinervis* (Burmeister), a Caribbean species. Calvert's (1901) record from Seminole Co. was probably a labelling error (see *Brachymesia furcata*).  
*E. umbrata* is common at temporary pools in southern Florida.  
Flight season all year.
- [130] *IDIATAPHE CUBENSIS* (Scudder 1866)  
(52, Belle 1978), 65, 67, Keys  
Common at lentic habitats in southern Florida.  
Flight season all year.
- [131] *LIBELLULA AURIPENNIS* Burmeister 1839  
1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, (37, Westfall 1943b), 38, 39, 40, (41, 42, Westfall 1943b), 43, 44, 45, (46, Westfall 1943b), 47, 48, 49, 51, 52, 53, 56, 57, (58, Westfall 1943b), 59, 61, 63, (67, Westfall 1943b)  
Prior to Westfall's (1943b) study, this name was used for this species as well as his new species *L. needhami*. Thus Williamson's (1922) record for Hendry Co. needs confirmation.  
Common at grassy lakes throughout the Florida mainland, except scarce in southern Florida, where *L. needhami* is common.



Flight season 23 Feb - 27 Nov.

[132] *LIBELLULA AXILENA* Westwood 1837

1, 2, 3, 4, 7, 9, 10, 12, 13, 14, 16, 17, 19, 20, 21, 22, 23, 25, 26, 28, 29, 30, 32, 33, 34, 35, 38, 39, 43, 44, 47, 49, 50, 51, 52, 56, 59, 61, 63

Prior to Dunkle's (1985) study often confused with *L. incesta* and *L. vibrans*. Thus the Gadsden and Wakulla Co. records by Cross (1956), Volusia and Pinellas Cos. by Williamson (1922b), and Hendry Co. by Paulson (1966) all need confirmation.

Fairly common at swampy habitats south to Palm Beach Co.

Flight season 25 March - 19 Oct.

[133] *LIBELLULA DEPLANATA* (Rambur 1842)

1, 2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, (40, Bennefield 1965), 43, 44, (45, 46, Bennefield 1965), 48, (49, Bennefield 1965), 52, 53, (56, Bennefield 1965), (59, Paulson 1966), 60, (61, Bennefield 1965), 63, 64

Common at infertile lentic habitats south to Collier Co.

Flight season 4 Jan - 6 May, but according to Paulson (1966) the season extends from 25 Nov. through the winter in southern Florida.

[134] *LIBELLULA FLAVIDA* Rambur 1842

1, 2, 3, 4, 7, 9, 11, 12, 14

Flight season 4 April - 26 Sept.

[135] *LIBELLULA INCESTA* Hagen 1861

1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 16, 17, 19, 20, 21, 22, 24, 25, 26, 28, 32, 33, 35, 38, 39, 41, 42, 43, 44, 46, 47, 48, 50, 52, 53, 57, 59, 64, 66, 67

Prior to Dunkle (1985) often confused with *L. axilena* and *L. vibrans*. Therefore the Wakulla Co. record by Cross (1956), Volusia Co. by Williamson (1922b), and Sarasota, Hardee, and Hendry Cos. by Paulson (1966) require confirmation.

Common at lentic habitats throughout the Florida mainland.

Flight season 21 March - 7 Nov.

[136] *LIBELLULA JESSEANA* Williamson 1922

6, 7, 28, 33, (35, Westfall 1943b), 39, (40, Williamson 1922b), 43, 44, 63

Type locality Volusia Co., Figure-8 Pond, 2.5 mi N of Enterprise and 0.5 mi N of Buckeye Homestead Pond.

This taxon is morphologically identical to *L. auripennis*, but males have a different coloration. Also, males seem to prefer sparser grass for territories than male *L. auripennis*, and the flight season of *jesseana* is apparently shorter.

The range and habitat of *L. jesseana*, endemic to the sand-bottomed lakes of both the Florida Panhandle and Peninsula, are similar to those of *Didymops floridensis*. However, *L. jesseana* is much scarcer and probably more susceptible to extirpation from those lakes by eutrophication because it apparently prefers the most infertile lakes with the sparsest vegetation.

Flight season 21 April - 12 Sept.

[137] *LIBELLULA LYDIA* Drury 1770

1, 2, 3, 4, 8, 9, 11, 12, 14, 16, 17, 19, 20, 21, 22, 24, 25, 26, 27, 28, 32, 35?

This species is common at lentic habitats south only to Alachua Co. A specimen in the FSCA from Marion Co. appears to be from a student collection and may not be a reliable record.

Flight season 9 Feb - 16 Nov.

[138] *LIBELLULA NEEDHAMI* Westfall 1943

(1, Westfall 1943b), 2, 12, 13, (15, Cross 1956), 22, 28, 29, 32, 33, 34, 36, 39, 40, 44, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, Keys, (?Dry Tortugas, Pearse 1932)

Type locality Palm Beach Co., Canal Point.

Prior to Westfall (1943b) this species was confused with *L. auripennis*. *L. needhami* is found throughout Florida and prefers brackish or eutrophic lentic waters. It is most common coastally and in southern Florida.

Flight season 16 Feb - 1 Nov.

[139] *LIBELLULA PULCHELLA* Drury 1770

(14, 15, Westfall 1953b, and Cross 1956), 32

This species appears to be only a rare migrant in Florida, recorded from 4 specimens taken in September and October. Wright (1945) also noted that it was rare during the autumn of 1943 somewhere along the beach from Santa Rosa to Bay Cos.

[140] *LIBELLULA SEMIFASCIATA* Burmeister 1839

1, 2, 3, 4, 8, 9, (11, Neal & Whitcomb 1972), 12, 13, (14, Cross 1956), 15, 16, 17, 18, 20, 21, 26, 28, 32, 33, 34, 44

Uncommon at marshy forest ponds south to Orange Co.

Flight season 20 Feb - 19 Sept.

[141] *LIBELLULA VIBRANS* Fabricius 1793

1, 2, 3, 4, 5, 6, (7, Tennesen), 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, 39, 40, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52, 56, 59, 64

Prior to Dunkle (1985) often confused with *L. axilena* and *L. incesta*. Thus the following records need confirmation: Wakulla Co. (Cross 1956), Pinellas Co. (Williamson 1922b), and DeSoto, Lee, and Hendry Cos. (Paulson 1966).

Common at swampy habitats south to Collier Co.

Flight season 24 March - 11 Oct.

[142] *MACRODIPLAX BALTEATA* (Hagen 1861)

15, 19, 30, 32, 36, (38, Needham & Fisher 1936), 40, (41, Bick 1955), 43, 44, 45, 54, 58, 61, 64, 65, 66, 67, Keys, Dry Tortugas

Common primarily in coastal counties at brackish lentic habitats. Not recorded west of the Apalachicola River.

Flight season all year.

[143] *MIATHYRIA MARCELLA* (Selys in Sagra 1856)

(11, 14, Cross 1956), 19, 24, 25, 26, 27, 28, 29, 32, 33, 35, 37, 38, 42, 43, 44, 45, 46, 47, 50, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67

The first Florida record was in 1945 by Needham (1946). An earlier record based on a larva (Needham 1933) was a misidentification of a *Brachymesia gravida* (Westfall 1953a).

Associated with floating aquatic plants and common in the Peninsula, but known from only 4 specimens from the Panhandle.

- Flight season all year.
- [144] **MICRATHYRIA AEQUALIS** (Hagen 1861)  
67  
First found in Dade Co. in 1985 and still only known in Florida from ponds there.  
Flight season all year.
- [145] **MICRATHYRIA DIDYMA** (Selys in Sagra 1856)  
67  
First found in Dade Co. in 1985 and still known only from there in the U.S. It inhabits shady ponds and is scarcer than *M. aequalis* in Florida.  
Flight season all year.
- [146] **NANNOTHEMIS BELLA** Uhler, 1857  
2, 4, 9  
A very local inhabitant of bogs in the western Panhandle.  
Flight season 14 May - 29 July.
- [147] **ORTHEMIS FERRUGINEA** (Fabricius 1775)  
1, 8, 11, 12, 14, (15, Cross 1956), (17, Tennessen), 18, 19, 24, 25, 26, 27, 28, 29, 30, 32, 33, 38, 44, (45, Shiffer), 46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, (62, Shiffer), 63, 64, 65, 67, Keys  
This species has apparently recently spread northward and become common at lentic habitats throughout the state. It was listed for Key West by Hagen (1875). The earliest record in the FSCA for the Keys is 1932, for Orange Co. 1935, and for Duval Co. 1949.  
The red form of the male is confined largely to the Keys, but I found one mostly red male in Alachua Co. (photo in Dunkle 1989).  
Flight season all year.
- [148] **PACHYDIPLAX LONGIPENNIS** (Burmeister 1839)  
41  
Keys, Dry Tortugas, and all counties except 18, 38,  
This dragonfly is nearly as abundant in Florida as *Erythemis simplicicollis* at practically all lentic habitats.  
Flight season all year.
- [149] **PANTALA FLAVESCENS** (Fabricius 1798)  
1, 2, 3, 7, 8, 9, 10, 11, 12, 14, 15, 17, 19, 21, 26, 27, 28, 30, 32, 33, 34, 36, (40, Wright 1944a), 43, 44, 49, 50, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, Keys, Dry Tortugas  
This common, strongly flying, and migratory dragonfly is likely to appear anywhere in Florida.  
Flight season all year.
- [150] **PANTALA HYMENAEA** (Say 1839)  
7, 11, 12, (14, Cross 1956), 15, 25, 29, 32, 34, 44, 45, (52, Cross 1963), 62, 64, 66, 67, Keys, Dry Tortugas  
This strong-flying dragonfly might occur anywhere in Florida, but it is less common than *P. flavescens* and more difficult to collect.  
Flight season all year.
- [151] **PERITHEMIS TENERA** (Say 1839)  
(*P. seminole* Calvert, Byers 1930)  
All counties except 5, 7, 17, 18, 21, 31, 41, 42  
*P. tenera* is common throughout the Florida mainland at lentic habitats.  
Flight season all year.
- [152] **SYMPETRUM AMBIGUUM** (Rambur 1842)  
(4, Wright 1943), 7, 9, (14, Cross 1956), 16, 17, 22, 26, 32  
This is a scarce insect in Florida, occurring mostly at temporary ponds south only to Alachua Co.  
Flight season 3 May - 20 Nov.
- [153] **SYMPETRUM CORRUPTUM** (Hagen 1861)  
1966)  
2, 15, 32, (45, Shiffer), 47, 49, 61, (Keys, Paulson  
This dragonfly is a scarce migrant in Florida, appearing primarily in winter and spring. It seldom breeds in the state, But K.J. Tennessen (pers. comm.) saw it ovipositing in Santa Rosa Co. 20 Oct 1991.  
Flight season all year.
- [154] **SYMPETRUM VICINUM** (Hagen 1861)  
4, 6, 11  
Rare in Florida, known only from 3 specimens from the Panhandle.  
Flight season recorded is 27 May - 22 Aug.
- [155] **TAURIPHILA AUSTRALIS** (Hagen 1867)  
47, 65, 67  
Rare in Florida, associated with floating aquatic plants.  
Flight season recorded is early June - 21 October.
- [156] **TRAMEA ABDOMINALIS** (Rambur 1842)  
67, Keys  
Fairly common at ponds in extreme southern Florida.  
Flight season all year.
- [157] **TRAMEA BINOTATA** (Rambur 1842)  
16  
Known in Florida from 1 male in the FSCA, probably a stray but not at all battered, taken in Jefferson Co. 20 Sept 1979. All other Florida records of this species no doubt refer to *T. insularis*.
- [158] **TRAMEA CALVERTI** Muttkowski, 1910  
27, 47  
This insect is a rare migrant in Florida, known from 2 males collected on 8 and 21 October.
- [159] **TRAMEA CAROLINA** (Linnaeus 1763)  
Keys, and all counties except 3, 5, 13, 37, 41  
One male and 2 females of *T. onusta* from the Dry Tortugas in the FSCA were misidentified as *T. carolina* by Byers (1938).  
Common at lentic habitats throughout Florida.  
Flight season all year.
- [160] **TRAMEA INSULARIS** Hagen 1861  
(*T. binotata*, Byers 1930, based on Hagen's (1875) record)  
65, 67, Keys

Calvert (1901) recorded *T. insularis* from Seminole Co., but this must have been a mislabelled specimen (see *Brachymesia furcata*).

Fairly common at ponds in southernmost Florida.  
Flight season all year.

[161] *TRAMEA LACERATA* Hagen 1861

2, 3, 7, 9, (11, Neal & Whitcomb 1972), 12, (14, 15, Cross 1956), 19, 24, 25, 32, 34, 44, 50, (52, Cross 1963), 61, 64, 65, 66, 67, (Keys, Shiffer)

Fairly common at lentic waters throughout Florida.

Flight season probably all year, not recorded February.

[162] *TRAMEA ONUSTA* Hagen 1861

32, 48, 61, 64, 67, Keys, Dry Tortugas

This species was listed by Hagen (1875) from Key West, but the earliest in the FSCA were collected in 1936.

*T. onusta* is uncommon at ponds in southern Florida and rare in northern Florida.

Flight season probably all year, but not recorded in January or February.

DOUBTFUL FLORIDA RECORDS

1. *Enallagma traviatum* Selys 1876

Six males were listed from Leon Co., Tallahassee, Bull Pond by Byers (1927). According to Byers (1930), Byers himself did not collect these specimens. The whereabouts of these specimens and of Bull Pond are unknown, and the record must remain doubtful.

2. *Gomphus descriptus* Banks, 1896 and *G. mortimer* Needham 1943

Needham (1943) described *G. mortimer* based on 2 males supposedly collected at Chipola Dead Lake in April 1929. Westfall (1945) synonymized *mortimer* with *descriptus*. Since *descriptus* is otherwise known as an inhabitant of rapid Appalachian streams, Needham in 1929 must have switched labels of *G. minutus* collected in Florida with *descriptus* collected further north. *G. descriptus* has to be deleted from the Florida list. However, a trip to ascertain the presence of *G. descriptus* in Florida did result in the discovery of the Florida population of *Epitheca spinosa*!

3. *Potamarcha obscura* (Rambur 1842)

In the Florida State Collection of Arthropods are 2 females of this Asiatic libellulid, collected at Coral Gables, Dade Co., 28 April 1946 by Ralph L. Chermock. If this species was established in Florida, it has apparently since died out.

GAZETEER FOR DIFFICULT-TO-LOCATE FLORIDA LOCALITIES

I had trouble locating the following places listed in old literature, so the following list may be of future value. There is a more extensive gazeteer relative to entomology in Kimball (1965).

Capron = Fort Capron, St. Lucie Co.

Fort Thompson: just E of La Belle, Hendry Co.

Fort Mayaco = Port Mayaca on Lake Okeechobee, Martin Co.

Fort Reed: in Seminole Co.

Fort Xmas = Christmas, Orange Co.

Gunntown = Gulf Hammock, Levy Co.

Haulover: in north Miami Beach, Dade Co.

Lake Annie: in Highlands Co.

Lake Harney: on St. John's River, Volusia/Seminole Co. line

Lake Iamonia: Leon Co.

Lake Poinsett: Brevard Co.

Matheson Hammock: in south Miami, Dade Co.

Olga: in Lee Co.

Palm Springs: in Seminole Co.

Paradise Key = Royal Palm Hammock = Royal Palm State Park, now in Everglades National Park in Dade Co. A tree island, not a Florida Key

Sand Point: in Marion Co.

St. John's Bluff: in Jacksonville, Duval Co.

Tall Timbers Research Station: in Leon Co.

Vineland: in Orange Co.

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