# Census Route Study of Regal Fritillary (Speyeria idalia) At Sand Ridge State Forest, Mason County, Illinois

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CENSUS ROUTE STUDY OF REGAL FRITILLARY (*Speyeria idalia*) AT SAND RIDGE STATE FOREST, MASON COUNTY, ILLINOIS.

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**ABSTRACT**: An assessment of occurrence of state-endangered Speyeria idalia, the Regal fritillary butterfly, was conducted at Sand Ridge State Forest in Mason County, Illinois. Different grassland communities throughout Sand Ridge that were determined by LaGesse et al. 2004 as Regal fritillary use areas were surveyed. Eleven transects were sampled fifteen times during the growing season in 2005. 1717 total sightings of Regal fritillary butterflies were documented. The adult male population peaked at 491 individuals on 19 June. The adult female population peaked at 83 individuals on 3 July. Regal fritillaries most often occurred in wildlife plantings (61.8% of sightings) and degraded sand prairie (33% of sightings).

# INTRODUCTION

Butterflies dependent on prairie have declined nationwide due to habitat destruction. Habitat loss is one of the leading factors causing the decline of the Regal fritillary *Speyeria idalia* (Drury) in the Great Plains. On a national level, the Regal fritillary has experienced dramatic declines throughout its historic range, and only three populations currently exist in states east of Illinois (NatureServe 2004).

Regal fritillary populations have also declined in Illinois, causing this butterfly to be listed as endangered by the Illinois Endangered Species Protection Board (Herkert 1992). Currently, Mason and Cass counties contain the largest known metapopulations (Wiker, 2004, Hess 2004, pers. com.). One population exists at Sand Ridge State Forest (SRSF) in northern Mason County.

Habitat loss has also reduced native violet populations, the larval food of this insect (LaGesse, et al. 2004). Larvae of Lepidoptera, in general, are very specific in their feeding requirements and, in many cases, require a specific species within a genus (Ehrlich and Raven 1964). The purpose of this study was to establish land usage requirements for Regal Fritillary Butterflies at SRSF and to start to develop baseline population studies for the SRSF Regal Butterfly population .

## Description of the Study Site

SRSF is located in Mason County in west central Illinois within the Illinois River Section of the Mississippi and the Illinois Rivers Sand Areas Natural Division (Schwegman et al. 1973). Glacial melt waters formed this extensive sand deposit at the end of the last glacial epoch

approximately 11,000 years ago. Subsequent wind action created dune and swale topography, known as the Parkland Formation, that typifies much of Mason County (Willman and Frye 1970).

The climate of SRSF is continental, characterized by hot summers and cold winters. Based upon data from Havana approximately 15 km to the west, the mean annual precipitation is 96.0 cm, most of which falls as precipitation during spring months. May, with a mean average of 11.3 cm, is usually the month of greatest rainfall. July, with a mean annual temperature of 24.6 degrees C, is usually the warmest while January, with a mean annual temperature of –5.0 degrees C, is usually the coldest. The average number of frost-free days per year is 173, but this figure varies from 140 to as much as 206 days per year (Midwest Regional Climate Center 2002).

The Mason County soil survey places most soils within SRSF in the Plainfield-Bloomfield Soil Association. One of the primary soil types within this association, Plainfield fine sandy loam, is a major soil within SRSF. This soil may contain up to 98 % sand, and is known to occur on gently sloping to steep areas such as dunes. This soil is excessively drained, and often subject to wind erosion when the vegetative cover is removed. Bloomfield Fine Sandy Loam is also an excessively drained soil that contains a high percentage of sand. It occurs along terraces and gently rolling dunes. Like Plainfield soils, this soil is also subject to wind erosion. The native vegetation is scrub oaks and hickories (Calsyn 1995).

The most common plant community within SRSF is deciduous woodland that is comprised of black oak (*Quercus velutina* Lam.), blackjack oak (*Quercus marilandica* Muench), mockernut

hickory (*Carya tomentosa* (Poir.) Nutt.), and small numbers of black hickory (*Carya texana* Buckl.). Mature dry sand prairie, present in swales and other sites, consists of little bluestem (*Schizachyrium scoparium* (Michaux.) Nash), eastern prickly pear cactus (*Opuntia humifusa* (Raf.) Raf.), western ragweed (*Ambrosia psilostachya* DC), and panic grass (*Dichanthelium villosissimum* (Nash.) Freckm.). Fragrant sumac (*Rhus aromatica* Ait.) sometimes forms copses within these dry sand prairie communities. Red and white pine (*Pinus resinosa* Ait. and *P. strobus* L.) plantations are present throughout SRSF, and pine seedlings have naturalized in deciduous woodland throughout much of the forest. The invasive exotic garlic mustard (*Allaria petiolata* (Bieb.) Cavara & Grande) is also firmly established in the understory.

Hart and Gleason (1907) described plant communities and insect life of the sand areas of Illinois, including portions of SRSF. Maier (1976) compiled a list of vascular plants, and Jenkins et al. (1991) conducted a study of the woody vegetation of Bishop's Woods in the southern part of SRSF. McClain et al. (2005) described plant communities of the H. A. Gleason Nature Preserve, within SRSF.

Few studies of butterfly populations of Sand Ridge are available. Though Hart and Gleason (1907) documented insect life of the sand areas, no butterflies were included. In 1913 A. G. Vestal wrote *An Association of Illinois Sand Prairies*. The only comprehensive study of butterfly populations was conducted by Sedman and Hess (1985). They documented the presence of numerous butterfly species, including the Regal fritillary, and described their habitat.

During the spring of 2004, LaGesse et al. studied the *Viola* spp. at SRSF. Populations were mapped, counted and/or plots sampled to determine density estimates and locations of violets. Regal fritillary larvae were documented feeding on *Viola rafinesquii*, Johnny Jump-up, in the wildlife plantings at SRSF. Emergent areas at for Regal butterflies at SRSF were also documented.

**Natural History of the Regal Fritillary**

The Regal fritillary is a large, strong flying member of the family Nymphalidae, or brush-footed butterflies. In the spring, larvae begin feeding on bird's foot violet (*Viola pedata* L.), arrow-leaved violet (*Viola sagittata* Air), and prairie violet (*Viola pedatifida* G. Don) (WDNR 2000). After completing six instars, they pupate (Scudder 1889, Wagner et al. 1997). Adult males emerge in early June and are followed by adult females approximately two weeks later (Scudder 1889; Kopper, et al. 2001). The flight dates of the Regal fritillary range from 4 June – 16 September (Sedman and Hess 1985; Wiker 2004, pers. com., LaGesse et. al., 2004).

Mating begins soon after females emerge. Males die after two weeks of mating and fertilized females enter reproductive diapause for the next two months (Nagel et al. 1991; Kopper et al. 2001). During this period females nectar on common milkweed (*Asclepias syriaca* L.), butterfly milkweed (*Asclepias tuberosa* L.), dogbane (*Apocynum spp.*), pasture thistle (*Cirsium pumilum* (Nutt.) Spreng.), boneset (*Eupatorium perfoliatum* L.) (Sedman and Hess 1985), and field thistle (*Cirsium discolor* (Nutt.) Spreng) (Zercher et al. 2002). The diapause period between mating and oviposition is the most precarious time in the life span of the Regal fritillary. If drought, disease, predation, parasitism, or other catastrophes occur, the entire brood for the following year

is at risk. By early September females begin oviposition, depositing over 1000 eggs in clusters on violets (Wagner et al. 1997; Kopper et al. 2001). The eggs hatch and larvae feed on egg cases before entering winter dormancy (Scudder 1889; Mattoon et al. 1971; Kopper et al. 2001; Zercher et al. 2002).

## METHODS

Eleven transects were established in all areas identified by LaGesse et al. (2004) in which Regal fritillary butterflies were observed. The transects were established within several natural communities in SRSF including natural wildlife plantings, degraded sand prairie, timber, barrens, higher quality sand prairie, active dunes, and cool season grass plantings. Methods of observation followed Panzer (1992) and Zercher et al. (2002). Observers were trained to observe butterflies up to 10 meters on each side of the transect and to walk at a uniform pace. Teams of two walked each transect, with one person acting as the observer and one person recording data. Observers identified all butterflies to species and identified the sex of each Regal fritillary. Observers also identified behaviors of each individual fritillary along each transect segment. Teams walked transects once per week from 10:00 to 16:00 and ceased observations when temperatures rose over 100 degrees Fahrenheit. Occasionally, two days were needed to complete all eleven transects due to weather conditions. This occurred three times, twice due to high temperatures and once due to rain. Temperature and wind speed data were collected with a Kestrel ™ 3000 weather kit before and after each transect's survey. Cloud cover was estimated for each transect at the beginning of each walk. Time was recorded at the beginning and end of each transect's survey. Nectar plants were noted for each transect segment. Observations were

made through the growing season of 2005. Nomenclature for butterflies follows Miller and Brown 1981, and nomenclature for plants follows Mohlenbrock 2002.

## RESULTS

Transects were sampled fifteen times between May 18th and September 20th at SRSF. Table 1 shows comprehensive detailed results of male and female Regal fritillaries found on each transect and on each date. Regal fritillaries were observed during every survey date, except for the first survey on May 18th, 2005. Table 2 provides a summary of the data and indicates the total number of sightings observed per each transect on each date. Males were observed from 27 May through 7 August 2005. The first observations of females did not occur until approximately two weeks after the first male sightings, on 14 June 2005. Females were observed through 20 September 2005. Observations of males peaked on 19 June with a total of 491 sightings on the eleven transects. Sightings of males declined rapidly through early August. Female sightings peaked on 3 July 2005 with a total of 83 individuals observed on the eleven transects. Figure 1 shows the total numbers of males and females observed on each date across all transects. Males, once their wings hardened, were observed flying, patrolling for females, and nectaring. Females were first observed to be resting in thick warm season grasses and small eastern cedars. Table 4 provides a comprehensive tally of observed behaviors. Later in the season females were observed nectaring and resting in shade in larger shrubs and cedars when temperatures were above 95 degrees Fahrenheit.

The wildlife plantings were observed to have the highest number of occurrences of Regal fritillary butterflies (61.8%) of all natural communities sampled. Even when looking at meters sampled by natural communities type, we documented 0.0389 Regal fritillary's (♂&♀) observed by meters sampled in the Wildlife Plantings. Degraded sand prairie exhibited the second most occurrences with 33% of all observations recorded and 0.029 Regal fritillary's per meter sampled

(see Table 5 and 5A). This may correlate with the abundance of Johnny Jump-up violets, one of the Regal fritillary's host plants that occur in these same areas (LaGesse et al. 2004).

The active dunes in Gleason Nature Preserve were found to be the hottest areas at SRSF. On several days, temperatures were 10-15 degrees Fahrenheit higher at Gleason than in surrounding sand prairies at SRSF. This may be due to the bowl shapes of the dune formations in the Nature Preserve. Very little butterfly activity was documented in these areas under those conditions.

Other butterfly species and blooming forbs that may have served as potential nectar sources were qualitatively monitored. Forbs in bloom observed along each transect were recorded. Table 6 shows the forb species in bloom observed on survey dates along all transects. Thirty-eight species of other butterflies were observed during the survey dates. Butterfly species observed and dates of observations are included in Table 7.

## DISCUSSION

The highest number of observations of Regal fritillary activities were in the wildlife plantings and degraded sand prairie areas at SRSF. This is also where the highest numbers of *Viola rafinesquii*, Johnny Jump-up occur (LaGesse et. al. 2004). This and the location of degraded sand prairie and quality sand prairie near the wildlife plantings is one of the most important features that we need to expand on. These prairie areas are providing nectar sources that the wildlife planting currently do not provide. These small grassland areas and their future management are important for the continued survival of Regal fritillary butterflies.

We still do not know the effects of fire on the survival of Johnny Jump-up or on in-situ survival of the first instar of Regal fritillary caterpillars. These are important issues that need further study.

None of the areas documented in this study and LaGesse et al. 2004 as used by Regal fritillary butterflies has nectar sources that occur throughout the whole growing season. This likely causes Regal fritillaries to travel to find new nectar sources, increasing their vulnerability to predation, automobiles and/or getting lost in the vast systems of fire breaks at SRSF. Most nectar sources occur in prairies, field edges, along roads and/or firebreaks. Enhancing the degraded sand prairies and wildlife fields in favor of nectar sources could greatly benefit the Regal fritillary at SRSF.

One has to be very careful in interpreting population numbers from this type of observation data. We can assume population totals from a single day's data are more reliable than the overall season totals. We can assume that there were at least 491 males and 83 females present at SRSF. If so, this would be the largest population in Illinois according to the Nature Biotics 4 database at Illinois Department of Natural Resources in Springfield, Illinois. More study needs to be conducted to confirm the population size at SRSF and the status of other Regal occurrences in Illinois. Mark-Release-Recapture studies are the recommended way to document population estimates of these rare, mobile butterfly species and this should be considered for future studies of Regal fritillary butterflies at SRSF and elsewhere in Illinois.

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Volume II of the Final Environmental Impact Statement, Enhanced Training and Operations at the National Guard Training Center at Fort Indiantown Gap Prepared by Ogden Environmental and Energy Services. Cincinnati, OH.

# Figure 1. Speyeria idalia Census Survey 2005

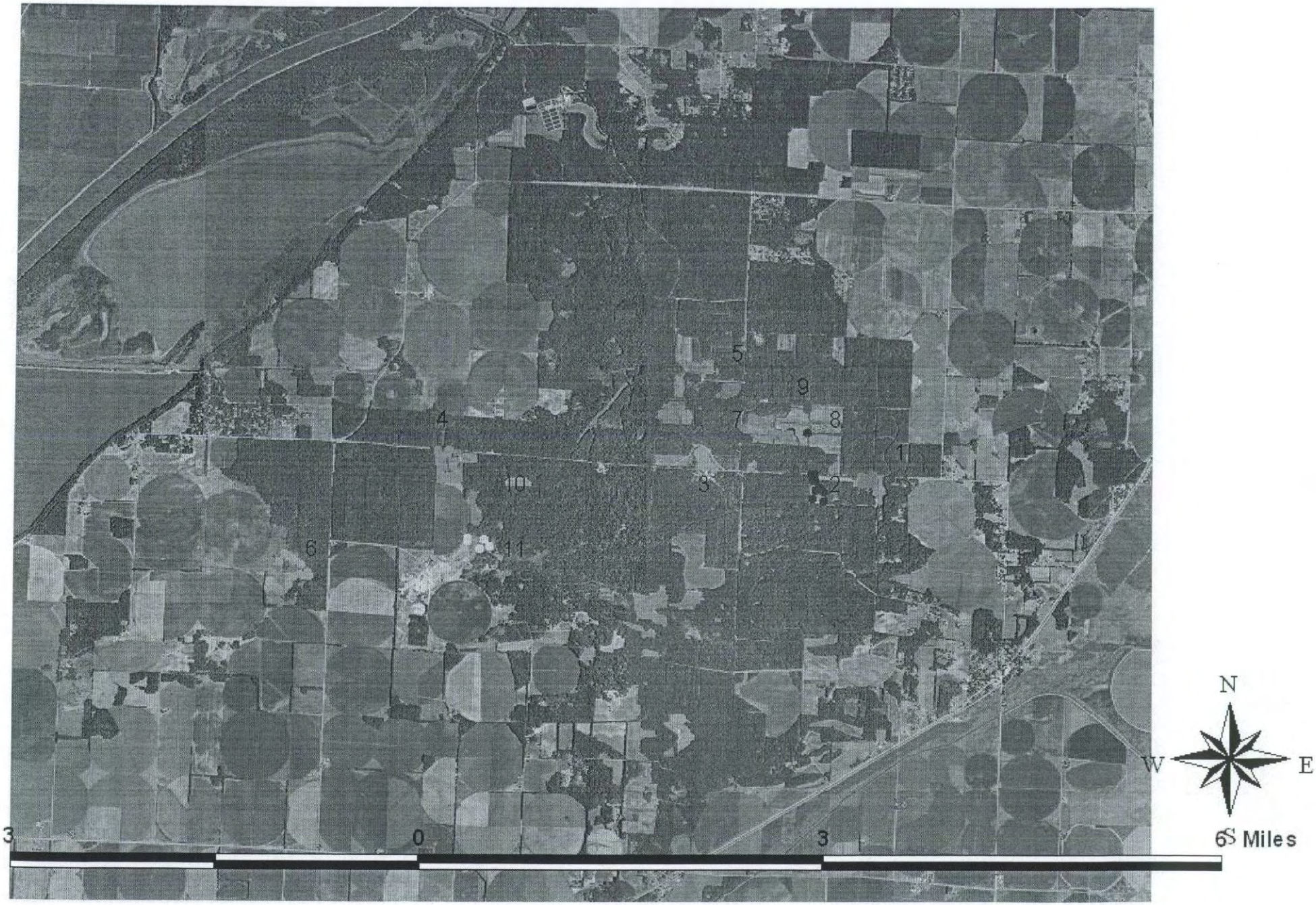

**Figure 1. Total *Speyeria idalia* sightings per date**

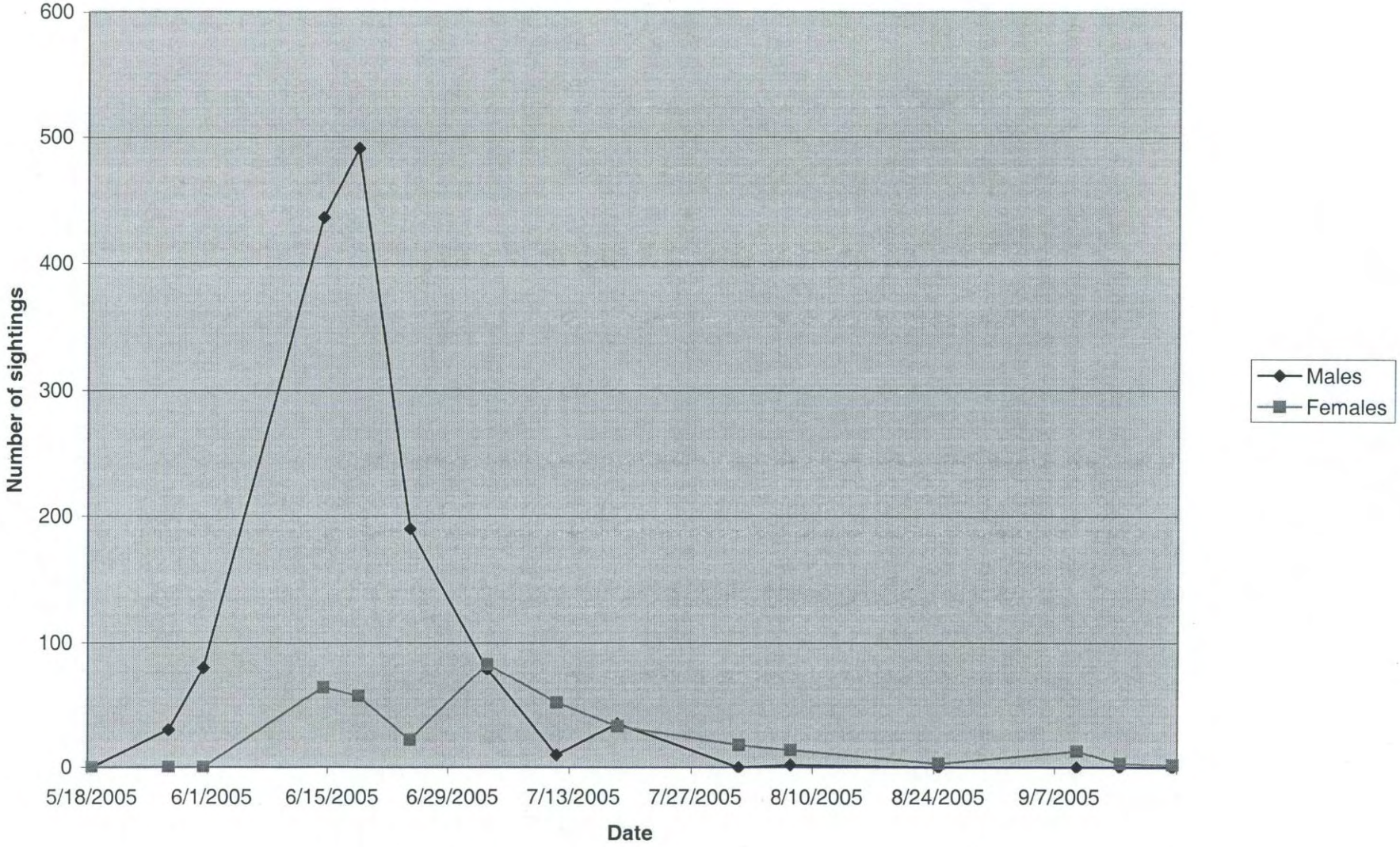

**Table 1. Comprehensive Study Results: Male and Female *Speyeria idalia* sightings on each trans**

| Census Route | Census Segment | Segment Length (m) | Natural Community | 18-May-05 | | 27-May-05 | |
|---|---|---|---|---|---|---|---|
| | | | | Male | Female | Male | Female |
| Transect 1 | AB | 85.89 | WP | 0 | 0 | 0 | 0 |
| | BC | 41.99 | WP | 0 | 0 | 0 | 0 |
| | CD | 57.67 | WP | 0 | 0 | 0 | 0 |
| | DE | 40.15 | WP | 0 | 0 | 1 | 0 |
| | EF | 68.42 | WP | 0 | 0 | 1 | 0 |
| | FG | 55.16 | WP | 0 | 0 | 0 | 0 |
| | GH | 87.73 | WP | 0 | 0 | 0 | 0 |
| **Transect 1 Total** | | | | **0** | **0** | **2** | **0** |
| Transect 2 | AB | 82.50 | DSP | | | 1 | 0 |
| | BC | 125.66 | DSP | | | 1 | 0 |
| | CD | 98.96 | DSP | | | 1 | 0 |
| | DE | 125.89 | DSP | | | 2 | 0 |
| | EF | 117.47 | DSP | | | 0 | 0 |
| | FG | 63.30 | DSP | | | 0 | 0 |
| | GH | 96.46 | DSP | | | 1 | 0 |
| | HI | 76.57 | DSP | | | 9 | 0 |
| **Transect 2 Total** | | | | | | **15** | **0** |
| Transect 3 | AB | 77.25 | DSP | | | | |
| | BC | 45.98 | DSP | | | | |
| | CD | 55.00 | T | | | | |
| | DE | 61.59 | DSP | | | | |
| | EF | 48.05 | T | | | | |
| | FG | 42.01 | B | | | | |
| | GH | 72.20 | B | | | | |
| | HI | 78.76 | B | | | | |
| | IJ | 44.60 | CSGP | | | | |
| **Transect 3 Total** | | | | | | | |
| Transect 4 | AB | 72.63 | WP | | | | |
| | BC | 53.85 | WP | | | | |
| | CD | 48.83 | WP | | | | |
| | DE | 46.34 | WP | | | | |
| | EF | 69.94 | DSP | | | | |
| | FG | 69.43 | DSP | | | | |
| | GH | 67.66 | DSP | | | | |
| | HI | 36.55 | WP | | | | |
| | IJ | 51.39 | WP | | | | |
| | JK | 59.11 | WP | | | | |
| | KL | 59.93 | WP | | | | |
| | LM | 55.62 | DSP | | | | |
| | MN | 80.67 | DSP | | | | |
| | NO | 57.16 | DSP | | | | |
| | OP | 113.60 | DSP | | | | |
| | PQ | 43.40 | DSP | | | | |
| | QR | 125.82 | WP | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Transect 4 Total** | | | | | |
| Transect 5 | AB | 42.06 | WP | 0 | 0 |
| | BC | 26.74 | WP | 0 | 0 |
| | CD | 35.98 | WP | 0 | 0 |
| | DE | 34.07 | WP | 0 | 0 |
| | EF | 39.38 | WP | 0 | 0 |
| | FG | 71.65 | WP | 0 | 0 |
| | GH | 63.05 | WP | 0 | 0 |
| | HI | 46.59 | WP | 0 | 0 |
| **Transect 5 Total** | | | | **0** | **0** |
| Transect 6 | AB | 55.99 | QSP | 0 | 0 |
| | BC | 72.46 | T | 0 | 0 |
| | CD | 85.84 | QSP | 0 | 0 |
| | DE | 99.14 | DSP | 0 | 0 |
| | EF | 124.26 | DSP | 1 | 0 |
| | FG | 50.22 | DSP | 0 | 0 |
| | GH | 82.26 | QSP | 5 | 0 |
| | HI | 79.19 | D | 1 | 0 |
| | IJ | 256.37 | CSGP | 0 | 0 |
| | JK | 116.86 | DSP | 0 | 0 |
| | KL | 59.29 | QSP | 0 | 0 |
| | LM | 63.98 | QSP | 0 | 0 |
| | MN | 36.43 | QSP | 1 | 0 |
| | NO | 99.50 | QSP | 0 | 0 |
| | OP | 126.33 | QSP | | |
| **Transect 6 Total** | | | | **8** | **0** |
| **Transect 7 Total** | AB | 184.04 | WP | 1 | 0 |
| Transect 8 | AB | 252.18 | WP | 3 | 0 |
| | BC | 252.04 | DSP | 1 | 0 |
| **Transect 8 Total** | | | | **4** | **0** |
| Transect 9 | AB | 48.05 | QSP | | |
| | BC | 55.02 | QSP | | |
| | CD | 55.17 | QSP | | |
| | DE | 16.31 | DSP | | |
| | EF | 54.57 | DSP | | |
| | FG | 52.39 | DSP | | |
| | GH | 82.46 | DSP | | |
| | HI | 33.93 | DSP | | |
| | IJ | 13.37 | DSP | | |
| | JK | 82.76 | DSP | | |
| | KL | 96.07 | DSP | | |
| | LM | 24.81 | DSP | | |
| | MN | 37.03 | DSP | | |
| | NO | 43.17 | DSP | | |
| | OP | ??? | DSP | | |
| **Transect 9 Total** | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Transect 10 Total** | AB | 316.76 | DSP | | | | |
| Transect 11 | AB | 189.72 | DSP | | | | |
| | BC | 103.09 | DSP | | | | |
| | CD | 117.74 | DSP | | | | |
| | DE | 168.36 | DSP | | | | |
| **Transect 11 Total** | | | | | | | |
| **TOTALS** | | | | 0 | 0 | 30 | 0 |
| | | | | Male | Female | Male | Female |

| **Natural Community** | Male | Female | Male | Female |
|---|---|---|---|---|
| WP | 0 | 0 | 6 | 0 |
| DSP | 0 | 0 | 17 | 0 |
| T | 0 | 0 | 0 | 0 |
| B | 0 | 0 | 0 | 0 |
| QSP | 0 | 0 | 6 | 0 |
| D | 0 | 0 | 1 | 0 |
| CSGP | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 30 | 0 |

Notes:
WP = Wildlife Planting
DSP = Degraded Sand Prairie
T = Timber
B = Barrens
QSP = Quality Sand Prairie: Little Blue Stem/June Grass Prairie/Blowout
D = Active Dune
CSGP = Cool Season Grass Planting

Light blue shading indicates no data were collected.

## ;ect segment per survey date and by natural community

| 31-May-05 | | 14-Jun-05 | | 18-Jun-05 | | 24-Jun-05 | | 3-Ju |
|---|---|---|---|---|---|---|---|---|
| Male | Female | Male | Female | Male | Female | Male | Female | Male |
| | | 12 | 1 | 15 | 2 | 24 | 0 | 1 |
| | | 3 | 2 | 9 | 4 | 8 | 0 | 1 |
| | | 2 | 2 | 15 | 3 | 11 | 1 | 3 |
| | | 18 | 0 | 9 | 2 | 11 | 0 | 2 |
| | | 18 | 1 | 7 | 3 | 16 | 1 | 2 |
| | | 21 | 0 | 23 | 1 | 12 | 1 | 3 |
| | | 44 | 0 | 29 | 0 | 24 | 0 | 10 |
| | | **118** | **6** | **107** | **15** | **106** | **3** | **22** |
| | | 12 | 0 | 9 | 1 | 0 | 0 | 2 |
| | | 21 | 4 | 13 | 0 | 8 | 0 | 1 |
| | | 14 | 0 | 5 | 0 | 4 | 0 | 3 |
| | | 22 | 0 | 8 | 0 | 4 | 0 | 1 |
| | | 8 | 1 | 2 | 0 | 3 | 0 | 0 |
| | | 1 | 0 | 4 | 1 | 1 | 0 | 0 |
| | | 2 | 0 | 7 | 1 | 2 | 0 | 0 |
| | | 3 | 2 | 13 | 1 | 3 | 0 | 1 |
| | | **83** | **7** | **61** | **4** | **25** | **0** | **8** |
| 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 5 | 0 | 1 | 0 | 2 | 0 | 0 |
| 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2** | **0** | **9** | **1** | **9** | **0** | **4** | **0** | **0** |
| 0 | 0 | 3 | 2 | 10 | 1 | 2 | 1 | 7 |
| 1 | 0 | 4 | 2 | 5 | 2 | 1 | 0 | 12 |
| 2 | 0 | 8 | 0 | 5 | 1 | 2 | 4 | 4 |
| 0 | 0 | 4 | 1 | 13 | 0 | 0 | 0 | 7 |
| 2 | 0 | 3 | 1 | 5 | 2 | 3 | 0 | 3 |
| 0 | 0 | 4 | 3 | 6 | 1 | 0 | 0 | 0 |
| 0 | 0 | 7 | 0 | | | 3 | 0 | 0 |
| 0 | 0 | 3 | 3 | 2 | 0 | 0 | 2 | 0 |
| 1 | 0 | 0 | 1 | 7 | 2 | 4 | 0 | 0 |
| 0 | 0 | 0 | 2 | 8 | 0 | 3 | 0 | 0 |
| 0 | 0 | 7 | 3 | 10 | 1 | 3 | 0 | 0 |
| 2 | 0 | 4 | 1 | 5 | 1 | 0 | 0 | 0 |
| 1 | 0 | 4 | 0 | 4 | 1 | 3 | 0 | 0 |
| 1 | 0 | 10 | 2 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 4 | 0 | 2 | 1 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2 | 0 | 6 | 0 | 18 | 0 | 1 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **12** | **0** | **72** | **21** | **101** | **14** | **25** | **9** | **34** |
| 0 | 0 | 5 | 0 | 19 | 0 | 6 | 1 | 0 |
| 1 | 0 | 8 | 0 | 6 | 0 | 0 | 0 | 1 |
| 1 | 0 | 5 | 0 | 5 | 0 | 0 | 1 | 1 |
| 2 | 0 | 5 | 0 | 10 | 0 | 0 | 0 | 1 |
| 2 | 0 | 4 | 0 | 12 | 0 | 2 | 0 | 1 |
| 4 | 0 | 4 | 0 | 8 | 2 | 0 | 1 | 0 |
| 4 | 0 | 6 | 3 | 5 | 2 | 0 | 0 | 4 |
| 4 | 0 | 2 | 0 | 7 | 0 | 0 | 1 | 0 |
| **18** | **0** | **39** | **3** | **72** | **4** | **8** | **4** | **8** |
| | | 0 | 0 | 2 | 0 | 6 | 0 | 1 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 1 | 0 | 5 | 0 | 0 |
| | | 6 | 0 | 8 | 0 | 0 | 0 | 0 |
| | | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | 18 | 0 | 0 | 1 | 0 | 0 | 0 |
| | | 7 | 1 | 2 | 3 | 0 | 1 | 0 |
| | | 5 | 0 | 4 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 2 | 2 | 0 | 0 | 1 | 0 | 0 |
| | | | | 1 | 0 | 0 | 0 | 0 |
| | | **39** | **3** | **22** | **4** | **13** | **1** | **1** |
| 8 | 0 | 18 | 7 | 30 | 3 | 4 | 1 | 1 |
| 8 | 0 | 7 | 3 | 7 | 2 | 0 | 2 | 1 |
| 4 | 0 | 5 | 1 | 4 | 0 | 1 | 0 | 0 |
| **12** | **0** | **12** | **4** | **11** | **2** | **1** | **2** | **1** |
| 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | |
| 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | |
| 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | |
| 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1 | 0 | | 0 | 2 | 0 | | | |
| 0 | 0 | 5 | 0 | 0 | 0 | 1 | 1 | |
| | | 4 | 0 | 0 | 1 | 0 | 0 | |
| 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | |
| 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1 | 0 | 2 | 0 | 3 | 0 | 0 | 1 | |
| 6 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **21** | **0** | **33** | **0** | **13** | **1** | **2** | **2** | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5 | 0 | 6 | 6 | 47 | 4 | 0 | 0 | 4 |
| 1 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 |
| 0 | 0 | 4 | 0 | 6 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 4 | 7 | 1 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 |
| **2** | **0** | **7** | **6** | **18** | **6** | **2** | **0** | **0** |
| 80 | 0 | 436 | 64 | 491 | 57 | 190 | 22 | 79 |
| Male | Female | Male | Female | Male | Female | Male | Female | Male |

**Total Sightings per Date and N**

| Male | Female | Male | Female | Male | Female | Male | Female | Male |
|---|---|---|---|---|---|---|---|---|
| 40 | 0 | 217 | 33 | 294 | 31 | 134 | 17 | 63 |
| 36 | 0 | 172 | 28 | 173 | 25 | 44 | 5 | 15 |
| 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2 | 0 | 6 | 0 | 1 | 0 | 3 | 0 | 0 |
| 2 | 0 | 19 | 2 | 21 | 0 | 8 | 0 | 1 |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 21 | 0 | 0 | 1 | 0 | 0 | 0 |
| 80 | 0 | 436 | 64 | 491 | 57 | 190 | 22 | 79 |

| ıl-05 | 10-Jul-05<br>11-Jul-05 | | 17-Jul-05<br>18-Jul-05 | | 1-Aug-05 | | 7-Aug-05 | |
|---|---|---|---|---|---|---|---|---|
| Female | Male | Female | Male | Female | Male | Female | Male | Female |
| 0 | 2 | 2 | 3 | 3 | 0 | 0 | 0 | 1 |
| 8 | 0 | 6 | 2 | 4 | 0 | 0 | 0 | 1 |
| 2 | 0 | 6 | 6 | 7 | 0 | 0 | 0 | 1 |
| 4 | 1 | 3 | 3 | 1 | 0 | 0 | 0 | 0 |
| 3 | 1 | 3 | 2 | 2 | 0 | 0 | 0 | 1 |
| 1 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 1 |
| 3 | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 3 |
| **21** | **5** | **21** | **21** | **20** | **0** | **0** | **0** | **8** |
| | | | | | | | | |
| 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| **3** | **1** | **1** | **7** | **2** | **0** | **4** | **0** | **1** |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** |
| | | | | | | | | |
| 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **35** | **1** | **10** | **1** | **1** | **0** | **0** | **0** | **1** |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| 5 | 0 | 4 | 1 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 2 |
| **9** | **1** | **5** | **3** | **3** | **0** | **5** | **2** | **3** |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **0** | **1** | **1** | **0** | **0** | **0** | **3** | **0** | **1** |
| 3 | 0 | 1 | 0 | 5 | 0 | 2 | 0 | 0 |
| 6 | 0 | 1 | 2 | 2 | 0 | 2 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **7** | **0** | **1** | **2** | **2** | **0** | **2** | **0** | **0** |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 11 | 1 | 0 | 0 | 1 | 0 | 0 |
| | | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **3** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** |
| | | | | | | | | |
| 83 | 10 | 52 | 35 | 33 | 0 | 18 | 2 | 14 |
| Female | Male | Female | Male | Female | Male | Female | Male | Female |

**latural Community**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Female | Male | Female | Male | Female | Male | Female | Male | Female |
| 68 | 7 | 37 | 26 | 30 | 0 | 9 | 2 | 12 |
| 15 | 2 | 14 | 9 | 3 | 0 | 5 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | | | | | | | |
| 83 | 10 | 52 | 35 | 33 | 0 | 18 | 2 | 14 |

| 24-Aug-05 | | 9-Sep-05 | | 14-Sep-05 | | 20-Sep-05 | | Total Males Per Segment |
|---|---|---|---|---|---|---|---|---|
| Male | Female | Male | Female | Male | Female | Male | Female | |
| 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 57 |
| 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 23 |
| 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 37 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 45 |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 47 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 62 |
| 0 | 0 | 0 | 3 | | | 0 | 0 | 110 |
| **0** | **1** | **0** | **10** | **0** | **1** | **0** | **1** | 381 |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 48 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 37 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 0 | 0 | 0 | 0 | 0 | 0 | | | 29 |
| **0** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | 200 |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | 24 |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 11 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **0** | **1** | **0** | **0** | **0** | **1** | **0** | **0** | 246 |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | 151 |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 9 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 19 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | | | | 0 | 0 | | | 2 |
| **0** | **0** | **0** | **1** | **0** | **1** | **0** | **0** | 84 |
| | | | | | | | | |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 62 |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | 43 |
| | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | 69 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 |
| **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | 29 |
| 0 | 3 | 0 | 13 | 0 | 3 | 0 | 2 | |
| Male | Female | Male | Female | Male | Female | Male | Female | |

| | | | | | | | | **Total Sightings** |
|---|---|---|---|---|---|---|---|---|
| Male | Female | Male | Female | Male | Female | Male | Female | |
| 0 | 2 | 0 | 11 | 0 | 2 | 0 | 1 | 1042 |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 567 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 65 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 0 | 3 | 0 | 13 | 0 | 3 | 0 | 2 | 1717 |

| Total Females Per Segment |
| --- |
| 11 |
| 27 |
| 24 |
| 12 |
| 16 |
| 6 |
| 11 |
| 107 |
| |
| 3 |
| 6 |
| 1 |
| 3 |
| 3 |
| 4 |
| 1 |
| 3 |
| 24 |
| |
| 0 |
| 0 |
| 1 |
| 0 |
| 0 |
| 1 |
| 0 |
| 0 |
| 0 |
| 2 |
| |
| 8 |
| 12 |
| 11 |
| 17 |
| 6 |
| 4 |
| 0 |
| 5 |
| 7 |
| 4 |
| 5 |
| 7 |
| 1 |
| 2 |
| 2 |
| 2 |
| 0 |

93

2
1
1
4
0
7
16
5
36

2
0
2
0
0
0
1
1
2
5
0
0
0
2
0
15

23

18
2
20

0
0
0
0
0
1
0
1
0
0
0
1
0
0
0
3

24

5
1
6
5
17

**Table 2. Total Speyeria idalia sightings per transect and survey date.**

| | 18-May-05 | | 27-May-05 | | 31-May-05 | | 14-Jun-05 | | 18-Jun-05 | | 24-Jun-05 | | 3-Jul-05 | | 11-Jul-05 | | 18-Ju |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Transect** | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male |
| **1** | 0 | 0 | 2 | 0 | 0 | 0 | 118 | 6 | 107 | 15 | 106 | 3 | 22 | 21 | 5 | 21 | 21 |
| **2** | 0 | 0 | 15 | 0 | 0 | 0 | 83 | 7 | 61 | 4 | 25 | 0 | 8 | 3 | 1 | 1 | 7 |
| **3** | 0 | 0 | 0 | 0 | 2 | 0 | 9 | 1 | 9 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| **4** | 0 | 0 | 0 | 0 | 12 | 0 | 72 | 21 | 101 | 14 | 25 | 9 | 34 | 35 | 1 | 10 | 1 |
| **5** | 0 | 0 | 0 | 0 | 18 | 0 | 39 | 3 | 72 | 4 | 8 | 4 | 8 | 9 | 1 | 5 | 3 |
| **6** | 0 | 0 | 8 | 0 | 0 | 0 | 39 | 3 | 22 | 4 | 13 | 1 | 1 | 0 | 1 | 1 | 0 |
| **7** | 0 | 0 | 1 | 0 | 8 | 0 | 18 | 7 | 30 | 3 | 4 | 1 | 1 | 3 | 0 | 1 | 0 |
| **8** | 0 | 0 | 4 | 0 | 12 | 0 | 12 | 4 | 11 | 2 | 1 | 2 | 1 | 7 | 0 | 1 | 2 |
| **9** | 0 | 0 | 0 | 0 | 21 | 0 | 33 | 0 | 13 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| **10** | 0 | 0 | 0 | 0 | 5 | 0 | 6 | 6 | 47 | 4 | 0 | 0 | 4 | 2 | 1 | 11 | 1 |
| **11** | 0 | 0 | 0 | 0 | 2 | 0 | 7 | 6 | 18 | 6 | 2 | 0 | 0 | 3 | 0 | 1 | 0 |
| **TOTAL** | 0 | 0 | 30 | 0 | 80 | 0 | 436 | 64 | 491 | 57 | 190 | 22 | 79 | 83 | 10 | 52 | 35 |

| ul-05 | 1-Aug-05 | | 7-Aug-05 | | 24-Aug-05 | | 9-Sep-05 | | 14-Sep-05 | | 20-Sep-05 | | TOTAL TRANSECT SIGHTINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | (M and F) |
| 20 | 0 | 0 | 0 | 8 | 0 | 1 | 0 | 10 | 0 | 1 | 0 | 1 | 488 |
| 2 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 224 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 339 |
| 3 | 0 | 5 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 187 |
| 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 99 |
| 5 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 85 |
| 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 63 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 88 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 46 |
| 33 | 0 | 18 | 2 | 14 | 0 | 3 | 0 | 13 | 0 | 3 | 0 | 2 | 1717 |
| | | | | | | | | | | | | | 1353 (males) |
| | | | | | | | | | | | | | 364 (females) |

**Table 4. Observed behaviors of *Speyeria idalia* per transect and survey date**

| | Behavior | 18-May-05 | | 27-May-05 | | 31-May-05 | | 14-Jun-05 | | 18-Jun-05 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| Transect 1 | Resting | 0 | 0 | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| | Flying | 0 | 0 | 0 | 0 | ND | ND | 105 | 0 | 105 | 0 |
| | Nectaring | 0 | 0 | 0 | 0 | ND | ND | 0 | 0 | 1 | 0 |
| | Puddling | 0 | 0 | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| | Flushed | 0 | 0 | 2 | 0 | ND | ND | 5 | 5 | 1 | 15 |
| | Ovipositioning | 0 | 0 | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| | Dead | 0 | 0 | 0 | 0 | ND | ND | 1 | 0 | 0 | 0 |
| | Mating | 0 | 0 | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| Transect 2 | Resting | ND | ND | 1 | 0 | ND | ND | 0 | 1 | 0 | 0 |
| | Flying | ND | ND | 3 | 0 | ND | ND | 75 | 0 | 52 | 0 |
| | Nectaring | ND | ND | 0 | 0 | ND | ND | 0 | 0 | 5 | 2 |
| | Puddling | ND | ND | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | 11 | 0 | ND | ND | 7 | 7 | 3 | 2 |
| | Ovipositioning | ND | ND | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | 0 | 0 | ND | ND | 0 | 0 | 0 | 0 |
| Transect 3 | Resting | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | ND | ND | 1 | 0 | 5 | 0 | 4 | 0 |
| | Nectaring | ND | ND | ND | ND | 0 | 0 | 4 | 0 | 5 | 0 |
| | Puddling | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | ND | ND | 1 | 0 | 0 | 1 | 0 | 0 |
| | Ovipositioning | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 4 | Resting | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | ND | ND | 6 | 0 | 49 | 4 | 89 | 0 |
| | Nectaring | ND | ND | ND | ND | 0 | 0 | 19 | 3 | 2 | 3 |
| | Puddling | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | ND | ND | 6 | 0 | 0 | 14 | 1 | 11 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ovipositioning | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 5 | Resting | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | 0 | 0 | 4 | 0 | 21 | 0 | 64 | 0 |
| | Nectaring | ND | ND | 0 | 0 | 0 | 0 | 8 | 0 | 9 | 0 |
| | Puddling | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | 0 | 0 | 14 | 0 | 3 | 3 | 0 | 4 |
| | Ovipositioning | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 6 | Resting | ND | ND | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 |
| | Flying | ND | ND | 2 | 0 | 0 | 0 | 26 | 0 | 22 | 0 |
| | Nectaring | ND | ND | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 3 |
| | Puddling | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | 6 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| | Ovipositioning | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 7 | Resting | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | 0 | 0 | 4 | 0 | 2 | 0 | 30 | 1 |
| | Nectaring | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Puddling | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | 1 | 0 | 4 | 0 | 15 | 7 | 0 | 2 |
| | Ovipositioning | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Mating | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 8 | Resting | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | 0 | 0 | 12 | 0 | 10 | 0 | 11 | 0 |
| | Nectaring | ND | ND | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | Puddling | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | 4 | 0 | 0 | 0 | 2 | 2 | 0 | 2 |
| | Ovipositioning | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dead | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 9 | Resting | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | ND | ND | 10 | 0 | 25 | 0 | 8 | 0 |
| | Nectaring | ND | ND | ND | ND | 4 | 0 | 0 | 0 | 4 | 1 |
| | Puddling | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | ND | ND | 7 | 0 | 8 | 0 | 0 | 0 |
| | Ovipositioning | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 10 | Resting | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | ND | ND | 1 | 0 | 5 | 0 | 47 | 0 |
| | Nectaring | ND | ND | ND | ND | 1 | 0 | 0 | 0 | 0 | 2 |
| | Puddling | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | ND | ND | 3 | 0 | 1 | 5 | 0 | 2 |
| | Ovipositioning | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| Transect 11 | Resting | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flying | ND | ND | ND | ND | 1 | 0 | 2 | 0 | 18 | 0 |
| | Nectaring | ND | ND | ND | ND | 0 | 0 | 1 | 0 | 0 | 3 |
| | Puddling | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flushed | ND | ND | ND | ND | 1 | 0 | 4 | 6 | 0 | 3 |
| | Ovipositioning | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dead | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mating | ND | ND | ND | ND | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTALS** | | 0 | 0 | 30 | 0 | 80 | 0 | 417 | 62 | 481 | 57 |

| 24-Jun-05 | | 3-Jul-05 | | 10-Jul-05<br>11-Jul-05 | | 17-Jul-05<br>18-Jul-05 | | 1-Aug-05 | | 7-Aug-05 | | 24-Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 105 | 1 | 19 | 7 | 5 | 15 | 18 | 15 | 0 | 0 | 0 | 2 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 3 | 14 | 0 | 6 | 0 | 7 | 0 | 0 | 0 | 5 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 23 | 0 | 5 | 1 | 1 | 1 | 7 | 0 | 0 | 2 | 0 | 0 | 0 |
| 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 3 | 2 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 4 | 28 | 15 | 1 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 4 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 5 | 2 | 5 | 0 | 6 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 2 | 7 | 4 | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 2 | 0 |
| 5 | 1 | 1 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 3 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 2 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 0 | 0 | 0 |
| 2 | 0 | 1 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 0 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 2 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 4 | 1 | 0 | 4 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| 189 | 26 | 81 | 81 | 10 | 52 | 32 | 36 | 0 | 19 | 0 | 16 | 1 |

| ıg-05 | 9-Sep-05 | | 14-Sep-05 | | 20-Sep-05 | |
|---|---|---|---|---|---|---|
| Female | Male | Female | Male | Female | Male | Female |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 |

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

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0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

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| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| 2 | 0 | 13 | 0 | 3 | 0 | 2 |

**Table 5A. Total Speyeria idalia sightings per natural community and survey date**

| | 18-May-05 | | 27-May-05 | | 31-May-05 | | 14-Jun-05 | | 18-Jun-05 | | 24-Jun-05 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| **Natural Community** | | | | | | | | | | | | |
| **WP** | 0 | 0 | 6 | 0 | 40 | 0 | 217 | 33 | 294 | 31 | 134 | 17 |
| **DSP** | 0 | 0 | 17 | 0 | 36 | 0 | 172 | 28 | 173 | 25 | 44 | 5 |
| **T** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| **B** | 0 | 0 | 0 | 0 | 2 | 0 | 6 | 0 | 1 | 0 | 3 | 0 |
| **QSP** | 0 | 0 | 6 | 0 | 2 | 0 | 19 | 2 | 21 | 0 | 8 | 0 |
| **D** | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| **CSGP** | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 1 | 0 | 0 |
| **Total** | 0 | 0 | 30 | 0 | 80 | 0 | 436 | 64 | 491 | 57 | 190 | 22 |

Notes:
WP = Wildlife Planting
DSP = Degraded Sand Prairie
T = Timber
B = Barrens
LBS = Little Blue Stem/June Grass Prairie
D = Active Dune
CSGP = Cool Season Grass Planting

| 3-Jul-05 | | 11-Jul-05 | | 18-Jul-05 | | 1-Aug-05 | | 7-Aug-05 | | 24-Aug-05 | | 9-Se |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male |
| 63 | 68 | 7 | 37 | 26 | 30 | 0 | 9 | 2 | 12 | 0 | 2 | 0 |
| 15 | 15 | 2 | 14 | 9 | 3 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 79 | 83 | 10 | 52 | 35 | 33 | 0 | 18 | 2 | 14 | 0 | 3 | 0 |

| p-05 | 14-Sep-05 | | 20-Sep-05 | | |
|---|---|---|---|---|---|
| Female | Male | Female | Male | Female | **Total per Community** |
| 11 | 0 | 2 | 0 | 1 | 1042 |
| 1 | 0 | 0 | 0 | 1 | 567 |
| 0 | 0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 13 |
| 1 | 0 | 1 | 0 | 0 | 65 |
| 0 | 0 | 0 | 0 | 0 | 4 |
| 0 | 0 | 0 | 0 | 0 | 23 |
| 13 | 0 | 3 | 0 | 2 | |

**Table 5. Total sightings per natural community and percent of sightings per natural community**

| Natural Community | ♂ | ♀ | Total Sightings | % Total | Sightings by meters sampled |
|---|---|---|---|---|---|
| WP | 789 | 253 | 1042 | 61.8 | .0389 |
| DSP | 468 | 99 | 567 | 33 | .0296 |
| T | 2 | 1 | 3 | 0.01 | .0011 |
| B | 12 | 1 | 13 | 0.07 | .0045 |
| QSP | 58 | 7 | 65 | 3.8 | .0056 |
| D | 3 | 1 | 4 | 0.02 | .0033 |
| CSGP | 21 | 2 | 23 | 1.3 | .0051 |
| TOTALS | 1309 | 363 | 1717 | 100 | 0.0881 |

| | |
|---|---|
| WP | Wildlife Planting (Switch/Indian Grass) |
| DSP | Degraded Sand Prairie |
| T | Timber |
| B | Barrens |
| QSP | Quality Sand Prairie |
| D | Active Dune |
| CSGP | Cool Season Grass Planting |

**Table 6. Potential nectar plants in bloom during survey dates**

| Common Name | Scientific Name | 18-May | 27-May | 31-May | 14-Jun | 18-Jun | 24-Jun | 3-Jul | 10-Jul | 11-Jul | 17-Jul | 1-Aug | 7-Aug | 24-Aug | 9-Sep | 14-Sep | 20-Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Yellow Oxalis | *Oxalis dellenii* | x | x | | | | | | | | | | | | | | |
| Johny Jump-up | *Viola rafinesquii* | x | x | | | | | | | | | | | | | | |
| Common Yarrow | *Achillea mellefolium* | x | x | x | x | x | x | | | | | | | | | | |
| False Dandelion | *Pyrrhopappus carolinianus* | x | x | | | | | | | | | | | | | | |
| Toadflax | *Linaria spp.* | x | x | | | | | | | | | | | | | | |
| Hoary Puccoon | *Lithospermum canescens* | | x | x | x | x | x | | | | | | | | | | |
| Venus-looking-glass | *Triodanis sp.* | | x | x | x | x | x | | | | | | | | | | |
| Hairy Vetch | *Vicia villosa* | | | x | x | x | x | | | | | | | | | | |
| Western Wallflower | *Erysimum capitatum* | | | x | | | | | | | | | | | | | |
| Pale Beardstongue | *Penstemon pallidus* | | | | | x | x | | | | | | | | | | |
| Goats Beard | *Tragopogon dubius* | | | | | x | | | | | | | | | | | |
| Daisy Fleabane | *Erigeron annuus* | | | | x | x | x | x | x | x | x | x | | | | | |
| Hoary Vervain | *Verbena stricta* | | | | | x | x | x | x | x | x | x | x | x | | | |
| Horsemint | *Monarda punctata* | | | | | | | x | x | | x | x | x | x | x | x | |
| Golden Aster | *Heterotheca villosa* | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Wavy Leaved Milkweed | *Asclepias amplexicaulis* | | | | | x | x | x | | | | | | | | | |
| Eastern Prickly Pear Cactus | *Opuntia humifusa* | | | | x | x | x | x | x | x | x | x | | | | | |
| Bouncing Bet | *Saponaria officinalis* | | | | | | | x | x | x | x | x | x | x | | | |
| Sand Primrose | *Oenothera rhombipetala* | | | | | | | x | x | x | x | x | x | x | | | |
| Black-eyed Susan | *Rudbeckia hirta* | | | | x | x | x | x | x | x | x | x | x | | | | |
| Day Flower | *Commelina sp.* | | | | | x | x | x | x | x | x | x | x | x | | | |
| Cotton Plant | *Froelichia floridana* | | | | | | | x | x | x | x | x | x | x | | | |
| Ohio Spiderwort | *Tradescantia ohiensis* | | x | x | x | x | x | x | | | | | | | | | |
| New Jersey Tea | *Ceanothus americanus* | | | | x | x | x | x | x | | | | | | | | |
| Butterfly Milkweed | *Asclepias tuberosa* | | | | x | x | x | x | x | x | x | x | | | | | |
| Goats Rue | *Tephrosia virginiana* | | x | x | x | x | x | x | x | | | | | | | | |
| Deptford Pink | *Dianthus armeria* | | | | x | x | x | x | x | x | x | x | | | | | |
| Common Sunflower | *Helianthus annus* | | | | | | | x | x | x | x | x | x | | | | |
| Whorled Milkweed | *Asclepias verticillata* | | | | | | | x | x | x | x | x | x | x | | | |
| Bush Clover | *Lespedeza capitata* | | | | | | | x | x | x | x | x | x | x | | | |
| Fragrant Summac | *Rhus aromatica* | | | | | | | x | x | | | | | | | | |
| St Johnswort | *Hypericum sp.* | | | | | | x | x | x | | | | | | | | |
| Gray Goldenrod | *Solidago sp.* | | | | | | | | | | | | | x | x | x | |
| Flowering Spurge | *Euphorbia corollata* | | | | | | | | | | x | x | x | x | x | | |
| Partridge Pea | *Cassia fasciculata* | | | | | | | | | | | x | x | x | | | |
| Germander | *Teucrium canadense* | | | | | | | | | | | | x | | | | |
| Field Thistle | *Cirsium discolor* | | | | | | | | | | | | | x | x | x | x |
| Ironweed | *Vernonia fasciculata* | | | | | | | | | | | | | x | | | |
| False Boneset | *Brickellia eupatoriodes* | | | | | | | | | | | | | x | x | x | x |
| Rough Blazingstar | *Liatris aspera* | | | | | | | | | | | | | | x | x | |
| Tall Goldenrod | *Solidago canadensis* | | | | | | | | | | | | | | x | x | x |
| Frost Aster | *Aster parviceps* | | | | | | | | | | | | | | | x | x |
| Aromatic Aster | *Aster oblongifoliuos* | | | | | | | | | | | | | | | | x |

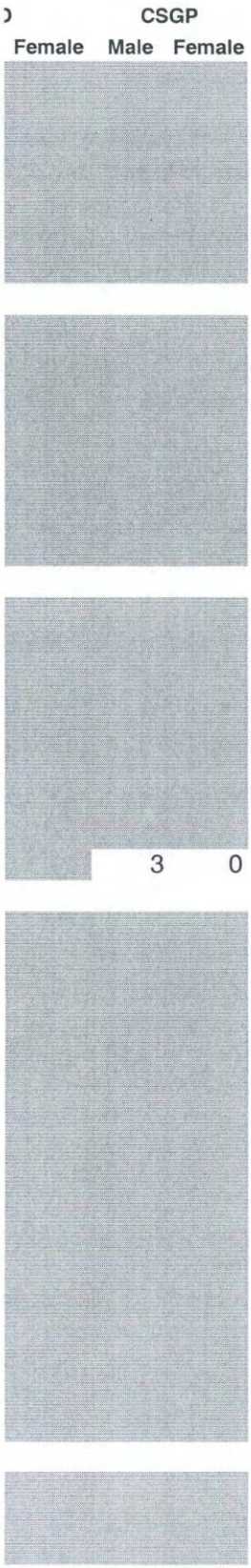
**Table 7. Butterfly species observed during *Speyeria idalia* census**

| Scientific Name | Common Name | 18-May-05 | 27-May-05 | 31-May-05 | 14-Jun-05 | 18-Jun-05 | 24-Jun-05 | 3-Jul-05 | 10-Jul-07 | 11-Jul-05 | 17-Jul-05 | 18-Jul-05 | 1-Aug-05 | 7-Aug-05 | 24-Aug-05 | 9-Sep-05 | 14-Sep-05 | 20-Sep-05 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Eurytides marcellus* | Zebra swallowtail | | | | | | | | | | | | | | | | | |
| *Pterourus troilus* | Spicebush Swallowtail | | | x | | | | | x | | | | | | x | x | x | x |
| *Battus philenor* | Pipe-vine Swallowtail | | | | | | | | | | | x | x | | x | | | |
| *Pterourus glaucus* | Tiger Swallowtail | x | x | x | | | x | x | x | | x | | x | x | x | | | |
| *Papilio polyxenes* | Black Swallowtail | | | | | | | | | | | | | | x | x | | |
| *Heraclides cresphontes* | Giant Swallowtail | | x | x | | | | | x | | x | | | x | | | | |
| *Ponita protodice* | Checkered White | | | | x | x | | x | x | | x | | x | x | x | | | |
| *Artogeia rapae* | Cabbage White | | | x | x | x | | | x | x | x | x | x | | | x | x | x |
| *Colias philodice* | Clouded Sulfur | | | | x | x | | | | | x | | x | x | x | x | x | x |
| *Colias eurytheme* | Orange Sulfur | | | | | | | | | | | | x | | | x | x | x |
| *Phoebis sennae* | Cloudless Sulfur | | | | | | | | | | | | x | x | x | x | x | x |
| *Pyrisitia lisa* | Little Sulfur | | | | | | | | | | x | | | x | | x | x | x |
| *Strymon melinus* | Gray Hairstreak | | | | | | | | | | | | | | | | x | x |
| *Harkenclenus titus* | Coral Hairstreak | | | | | x | | x | | | | | | | | | | |
| *Satyrium calanus* | Banded Hairstreak | | | | | x | | | x | | | | | | | | | |
| *Satyrium edwardsii* | Edwards Hairstreak | | | | | x | | | | | | | | | | | | |
| *Everes comyntas* | Eastern-Tailed Blue | | | | | x | | x | x | x | x | | | x | x | x | x | x |
| *Celastrina negecta* | Summer Azure | | | | | x | | | | | | | x | | x | | | |
| *Feniseca tarquinius* | Harvester | | | | | x | | | | | | | | | | | | |
| *Euptoieta claudia* | Variegated Fritillary | | | | x | x | x | x | x | | | | | | | | | |
| *Speyeria idalia* | Regal Fritillary | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| *Speyeria cybele* | Great Spangled Fritillary | | x | x | x | x | x | x | x | | x | | x | x | x | x | x | |
| *Chandryas nyteis* | Silvery Checkerspot | | | | | | | | | | | | | | | x | | x |
| *Phyciodes tharos* | Pearl Crescent | | | | | | x | | x | | | | | x | x | | x | x |
| *Lycaena phlaeas* | American Copper | x | | | x | x | x | | x | | | | x | | x | x | x | x |
| *Vanessa cardui* | American Painted Lady | | | | | x | | | | | | | x | | | | | x |
| *Vanessa virginiensis* | Painted Lady | | x | | | | x | | | | x | | x | x | x | x | x | |
| *Vanessa atalanta* | Red Admiral | | x | x | | x | | | x | | | | | | | | | |
| *Junonia coenia* | Buckeye | | | | | | | | | | | | | | | | | x |
| *Basilarchia arthemis* | Red Spotted Purple | | | | x | | x | | x | | | | | | | | | |
| *Basilarchia archippus* | Viceroy | | | | | | | | | | | | | | x | | | |
| *Nymphalis antiopa* | Mourning Cloak | | | | | | | | | | | | | | | | | x |
| *Astrocampa celits* | Hackberry | | | | x | | | | | | | | x | | | | | |
| *Megisto cymela* | Little Wood Satyr | | | | | | x | x | | x | | | | | | | | |
| *Danaus plexippus* | Monarch | | | x | | | | | x | | | x | x | x | x | x | x | x |
| *Epargyreus clarus* | Silver Spotted Skipper | | x | x | x | x | x | | x | x | x | x | x | x | x | x | x | x |
| *Thorybes pylades* | Northern Cloudywing | | | | | | | | | | | | | | | | | |
| *Erynnis juvenalis* | Juvenal's Duskywing | | | | | | | | | | | | | | | | | |
| *Erynnis horatius* | Horace's Duskywing | | | | | | | | | | | | | | | | | |
| *Pyrgus communis* | Checkered Skipper | | | | | | | | | | | | | | | | | |
| *Hylephila phyleus* | Fiery Skipper | | | | | | | | | | | | | | | | x | |
| *Atryone logan* | Delaware Skipper | | | | | | | | | | | | | | | | | |

| Census Route | Census Segment | WP | | DSP | | T | | B | | QSP | | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male |
| T1 | AB | 57 | 11 | | | | | | | | | |
| | BC | 23 | 27 | | | | | | | | | |
| | CD | 37 | 24 | | | | | | | | | |
| | DE | 45 | 12 | | | | | | | | | |
| | EF | 47 | 16 | | | | | | | | | |
| | FG | 62 | 6 | | | | | | | | | |
| | GH | 110 | 11 | | | | | | | | | |
| T2 | AB | | | 25 | 3 | | | | | | | |
| | BC | | | 48 | 6 | | | | | | | |
| | CD | | | 30 | 1 | | | | | | | |
| | DE | | | 37 | 3 | | | | | | | |
| | EF | | | 13 | 3 | | | | | | | |
| | FG | | | 6 | 4 | | | | | | | |
| | GH | | | 12 | 1 | | | | | | | |
| | HI | | | 29 | 3 | | | | | | | |
| T3 | AB | | | 5 | 0 | | | | | | | |
| | BC | | | 0 | 0 | | | | | | | |
| | CD | | | | | 2 | 1 | | | | | |
| | DE | | | 2 | 0 | | | | | | | |
| | EF | | | | | 0 | 0 | | | | | |
| | FG | | | | | | | 1 | 1 | | | |
| | GH | | | | | | | 3 | 0 | | | |
| | HI | | | | | | | 8 | 0 | | | |
| | IJ | | | | | | | | | | | |
| T4 | AB | 22 | 8 | | | | | | | | | |
| | BC | 23 | 12 | | | | | | | | | |
| | CD | 21 | 11 | | | | | | | | | |
| | DE | 24 | 17 | | | | | | | | | |
| | EF | | | 16 | 6 | | | | | | | |
| | FG | | | 10 | 4 | | | | | | | |
| | GH | | | 10 | 0 | | | | | | | |
| | HI | 5 | 5 | | | | | | | | | |
| | IJ | 12 | 7 | | | | | | | | | |
| | JK | 11 | 4 | | | | | | | | | |
| | KL | 21 | 5 | | | | | | | | | |
| | LM | | | 12 | 7 | | | | | | | |
| | MN | | | 12 | 1 | | | | | | | |
| | NO | | | 12 | 2 | | | | | | | |
| | OP | | | 6 | 2 | | | | | | | |
| | PQ | | | 1 | 2 | | | | | | | |
| | QR | 28 | 0 | | | | | | | | | |
| T5 | AB | 32 | 2 | | | | | | | | | |
| | BC | 16 | 1 | | | | | | | | | |
| | CD | 12 | 1 | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DE | 19 | 4 | | | | | | | | | |
| | EF | 21 | 0 | | | | | | | | | |
| | FG | 16 | 7 | | | | | | | | | |
| | GH | 20 | 16 | | | | | | | | | |
| | HI | 15 | 5 | | | | | | | | | |
| T6 | AB | | | | | | | | | 9 | 2 | |
| | BC | | | | | 0 | 0 | | | | | |
| | CD | | | | | | | | | 0 | 2 | |
| | DE | | | 1 | 0 | | | | | | | |
| | EF | | | 2 | 0 | | | | | | | |
| | FG | | | 6 | 0 | | | | | | | |
| | GH | | | | | | | | | 19 | 1 | |
| | HI | | | | | | | | | | | 3 |
| | IJ | | | | | | | | | | | |
| | JK | | | 9 | 5 | | | | | | | |
| | KL | | | | | | | | | 9 | 0 | |
| | LM | | | | | | | | | 2 | 0 | |
| | MN | | | | | | | | | 1 | 0 | |
| | NO | | | | | | | | | 3 | 2 | |
| | OP | | | | | | | | | 2 | 0 | |
| T7 | AB | 62 | 23 | | | | | | | | | |
| T8 | AB | 28 | 18 | | | | | | | | | |
| | BC | | | 15 | 2 | | | | | | | |
| T9 | AB | | | | | | | | | 3 | 0 | |
| | BC | | | | | | | | | 6 | 0 | |
| | CD | | | | | | | | | 4 | 0 | |
| | DE | | | 6 | 0 | | | | | | | |
| | EF | | | 0 | 0 | | | | | | | |
| | FG | | | 9 | 1 | | | | | | | |
| | GH | | | 0 | 0 | | | | | | | |
| | HI | | | 4 | 1 | | | | | | | |
| | IJ | | | 7 | 0 | | | | | | | |
| | JK | | | 3 | 0 | | | | | | | |
| | KL | | | 0 | 0 | | | | | | | |
| | LM | | | 6 | 1 | | | | | | | |
| | MN | | | 13 | 0 | | | | | | | |
| | NO | | | 6 | 0 | | | | | | | |
| | OP | | | 2 | 0 | | | | | | | |
| T10 | AB | | | 64 | 24 | | | | | | | |
| T11 | AB | | | 5 | 5 | | | | | | | |
| | BC | | | 10 | 1 | | | | | | | |
| | CD | | | 10 | 6 | | | | | | | |
| | DE | | | 4 | 5 | | | | | | | |
| Totals | | 789 | 253 | 468 | 99 | 2 | 1 | 12 | 1 | 58 | 7 | 3 |

Notes:
WP = Wildlife Planting
DSP = Degraded Sand Prairie
T = Timber
B = Barrens
QSP = Little Blue Stem/June Grass Prairie  Quality Sand Prairie
D = Active Dune
CSGP = Cool Season Grass Planting


CSGP
Female
Male
Female
3
0

1

18 2

1 21 2

| Census Route | Location of Census Route | Habitat | Total Length of Route | Route Segments |
|---|---|---|---|---|
| T1 | | Wildlife Planting | | 7 |
| T2 | | Degraded Sand Prairie | | 8 |
| T3 | Park Headquarters | Quality Sand Prairie | | 9 |
| T4 | Cable Gate | Cool season grass planting | | 17 |
| T5 | Archery Range | Stable dune | | 8 |
| T6 | Gleason Nature Preserve | Quality Sand Prairie | | 15 |
| T7 | | Quality Sand Prairie | | 1 |
| T8 | | Barrens | | 2 |
| T9 | | Timber | | 15 |
| T10 | | Degraded Sand Prairie | | 1 |
| T11 | | Degraded Sand Prairie | | 4 |