

Butterfly Report for Neal Smith National Wildlife Refuge 2001

During the summer of 2001 a butterfly survey was conducted at the Neal Smith National Wildlife Refuge in Jasper County, Prairie City, Iowa. The sites included the Tallgrass Trail, the Savanna Trail, and fifteen butterfly transects throughout the refuge. This survey observed butterfly species diversity, abundance and habitat distribution in relation to forbs and grasses in these sites. Observations were made between May 19, 2001 and August 13, 2001. The Tallgrass Trail and the Savanna Trail were surveyed four times during the summer.

Surveys were also conducted on sites 53A, 10, 27, 55, #99#1, 70, 68, 53, 22, 17, 42, 49, 45, 79, and 18. The transects were set up by Stephanie Shepherd, her assistant, and this observer. Due to time constraints these transects were only surveyed once between June 29, 2001 and August 13, 2001 by this observer. Therefore butterfly numbers from the transects cannot be compared to the trails however a comparison between butterfly species present is interesting. (See attached sheet for Transect Survey Instructions.)

Field notes and photographs were taken during the visits to each site. Butterflies, plants and plant associations were noted. No butterflies were netted or taken as specimens. Unknown or hard to identify butterflies were photographed by a Pentax camera with a 28-300 mm Macro Tamron zoom lens. Butterflies were then identified at home once the pictures were developed. Butterflies were identified according to Scott (1980), Heitzman and Heitzman (1987), Shull (1987) and Glassberg (1999).

Other factors noted were: date, time, and weather conditions. The weather conditions recorded included whether it was sunny, partly cloudy, cloudy or raining. An approximation of the wind was noted as calm, light or strong.

On July 22, 2001 a Fourth of July Butterfly Count was taken. Data from this count was sent to the North American Butterfly Association to be published. (A copy of report is attached.) This count included data collected by this observer from the Tallgrass and Savanna Trail. Stephanie Shepherd surveyed the Basswood Trail, Lone Oak Remnant and one of the transects site # 39. Except for the transect observations her data was not included in this report.

RESULTS AND DISCUSSION

Species and individuals present

Table 1 gives the dates, time spent per walk and number of individuals present. The most time was spent on the Tallgrass Trail because of the larger area and longer distance (2 miles) to cover compared to the Savanna Trail (0.5 miles). Times spent at each site varied depending upon the abundance butterflies and forbs present. The more butterflies present the longer the survey took.

Table 1. Visits to Tallgrass Trail and Savanna Trail, including dates, time spent during 2001 and number of individuals present.

	TALLGRASS TRAIL	Time	# individuals	SAVANNA TRAIL	Time	# individuals
Date	June 2	1:30	5	May 19	1:05	43
	June 29	1:39	257	June 9	0:15	8
				July 11	0:35	12
	July 22	1:40	174	July 22	0:40	24
	Aug 11	3:15	281			
Time/site		8:04			2:35	
TOTAL			717			87

It is interesting to note the number of individuals found on each date. On the Tallgrass Trail the most butterflies were seen on August 11 with 281 individuals and June 29 with 257 individuals. There were only five individuals on June 2. This pattern was not the same on the Savanna Trail. Here the most butterflies were seen on May 19 with 43 individuals and July 22 with 24 individuals. The lowest count was on June 9 with 8 individuals. The Savanna Trail data might be skewed because the last date butterflies observations were taken was July 22. There might have been more butterflies there in August. As can be seen different habitats have different numbers of individuals at different times.

Between the two trails the Savanna Trail had the smallest number of different species (19) (Table 2). The Tallgrass trail had the most with twenty nine which would be expected because it is longer (2 miles) and travels through several different habitats. The transects probably would have had more species and individuals present if they had been surveyed as many times as the trails were. Note that transects 53A, 10, 27, 55, and #99#1 were walked both ways while the rest of the transects were walked only 1 way as per Stephanie Shepherd. There were 18 different species seen at the Refuge this year.

Table 2. Numbers of species and individual butterflies seen per site during 2001.

	TALLGRASS TRAIL	SAVANNA TRAIL	TRANSECTS (surveyed once)	TOTAL
# SPECIES	29	19	13	
# INDIVIDUALS	717	87	81	885
LENGTH	2.0 miles	0.5 miles	1.2 miles	

The Tallgrass Trail, the longest trail, had more butterflies (717) than the Savanna Trail (87). Again size of the site and several different habitats were probable reasons for larger numbers at the Tallgrass Trail than the Savanna trail. It needs to be noted the numbers of butterfly individuals can fluctuate greatly from year to year depending on rainfall and numerous other variables. It would be interesting to see what happens numerically from year to year as sites, weather and forbs present change.

Most numerous species

Table 3 lists the most numerous butterflies per site. Only butterflies present more than 10 times were included in this list. Any butterflies present at any site were added even though the species may not have been abundant so a comparison between sites could be viewed. At the Tallgrass Trail the most numerous butterflies seen were: the Pearl Crescent (201), Red Admiral (149), Little Yellow (97), Eastern Tailed Blue (68), Painted Lady (44), Orange Sulfur (39), Clouded Sulfur (28), Monarch (26), Cabbage butterfly (16), and Tiger Swallowtail (11). The most numerous butterflies at the Savanna Trail were : the Painted Lady (20), and Pearl Crescent (16). As an aside in the transects the most numerous were: the Black Swallowtail (19), Orange Sulfur (18) and Eastern Tailed Blue (13).

The butterflies present here in large numbers are usually always found in large numbers. The more numerous individuals tend to use a wide variety of food and nectaring plants. They also tend to be found in varying habitats so one would expect more types of these individuals present. The butterflies found in lower numbers tend to be more picky about food and habitat so their numbers would be smaller unless there is significant source of food and habitat for them.

Table 3. Butterflies seen ten times or more at sites during 2001.

	TALLGRASS TRAIL	SAVANNA TRAIL	TRANSECTS
Pearl Crescent	201	16	7
Red Admiral	149	2	6
Little Yellow	97	9	0
Eastern Tailed Blue	68	8	13
Painted Lady	44	20	2
Orange Sulfur	39	2	18
Clouded Sulfur	28	4	6
Monarch	26	2	1
Cabbage Butterfly	16	0	5
Tiger Swallowtail	11	6	0
Black Swallowtail	0	0	19

INDIVIDUALS PRESENT

Pearl Crescents are a common species with three broods per year. Their major food source is asters although they were found on various other species. They were found several times on black eyed Susan (*Ratibida pinnata*). One would be expected to find them in large numbers.

Red admirals are commonly found in open habitats such as fields, and especially moist meadows near woodlands. Their major food plant is nettles however they did use red clover for nectaring. This species can be strongly migratory with several generation per year in this area.

The Little Yellow is most common in disturbed open areas, especially in dry, sandy, grassy fields. The major food plants are *Cassia fasciculata* and Fabaceae. They are very common.

The Eastern-Tailed Blue is also very common. It uses the Fabaceae as a food source. It was seen numerous times on rabbit-foot clover *Trifolium arvense* at the Refuge.

Painted Ladies are found in any type of open habitat. They were not found in association with any particular plant at the Refuge. They have several broods during the summer and their numbers vary greatly from year to year.

The Orange Sulfur's major food source is herbaceous Fabaceae, especially alfalfa (*Medicago*) (Heitzman and Heitzman, 1987). This species of butterfly also has multiple broods and tends to be found in large numbers.

Clouded Sulfurs are found in open fields, roadsides and suburban areas. They

are common and have multiple broods. Their food sources are from members of the Fabaceae family.

Monarchs can be found in open fields and roadsides. They are found in association with milkweeds (*Asclepias*).

Cabbage butterflies are an introduced species found in open or lightly wooded terrain and roadsides. Its major plants are crucifers.

Tiger Swallowtails are usually a woodland species. There are usually 2 broods per year.

Fewer of the hair streaks and skippers were probably not found since these butterflies tend to be more wary and less numerous. A complete list of all butterflies seen at each site is found in Table 4.

The plants most used by butterflies during the surveys were various clovers. These included alfalfa, red clover, rabbit-foot clover *Trifolium arvense*, white clover and yellow clover. Black eyed Susan, *Ratibida pinnata*, and Horsemint, *Monarda fistulosa*, were also used as a nectaring sources. In general you find butterflies near a food source. Most have preferences for food selection but many will use whatever is handy if it is necessary.

Table 4. Species of butterflies present and expected at each site in 2001.

SPECIES PRESENT	Tailgrass trail	Savanna Trail	Transects	TOTAL
Black Swallowtail <i>Papilio polyxenes</i>	6	1	19	26
Eastern Tiger Swallowtail <i>Papilio glaucus</i>	11	6		17
Checkered White <i>Pontia protodice</i>	1			1
Cabbage White <i>Pieris rapae</i>	16		5	21
Clouded Sulphur <i>Colias philodice</i>	28	4	6	38
Orange Sulphur <i>Colias eurytheme</i>	39	2	18	59
Little Yellow <i>Eurema lisa</i>	97	9		106
Gray Copper <i>Lycaena dione</i>	2			2
Bronze Copper <i>Lycaena hyllus</i>	2			2
American Copper <i>Lycaena phlaeas</i>				
Coral Hairstreak <i>Satyrium titus</i>	2			2
Banded Hairstreak <i>Satyrium calanus</i>				
Edward's Hairstreak <i>Satyrium edwardsii</i>				
Gray Hairstreak <i>Strymon melinus</i>				
Spring Azure <i>Celastrina landon</i>	2	3	1	6
Eastern Tailed-Blue <i>Everes comyntas</i>	68	8	13	89
Variegated Fritillary <i>Euptoieta claudia</i>				
Great Spangled Fritillary <i>Syeyeria cybele</i>		4	1	5
Meadow Fritillary <i>Boloria bellona</i>	1			1
Silvery Checkerspot <i>Chlosyne nycteis</i>				
Pearl Crescent <i>Phyciodes tharos</i>	201	16	7	224
Question Mark <i>Polygona interrogationis</i>				
Eastern Comma <i>Polygona comma</i>				
American Lady <i>Vanessa virginiensis</i>				
Painted Lady <i>Vanessa cardui</i>	44	20	2	66
Red Admiral <i>Vanessa atalanta</i>	149	2	6	157
American Snout <i>Libytheana carinenta</i>		1		1

Table 4 continued from previous page

SPECIES PRESENT	Tallgrass trail	Savanna Trail	Transects	TOTAL
Common Buckeye <i>Junonia coenia</i>	2			2
Red-spotted Purple <i>Limenitis arthemis astyanax</i>				
Viceroy <i>Limenitis archippus</i>	1			1
Hackberry Emperor <i>Asterocampa celtis</i>		2		2
Tawny Emperor <i>Asterocampa clyton</i>				
Common Wood Nymph <i>Cercyonis pegala</i>				
Eyed Brown <i>Satyrodes eurydice</i>				
Little Wood Satyr <i>Megisto cymela</i>				
Monarch <i>Danaus plexippus</i>	26	2	1	29
? Copper	1			1
? Swallowtail	6			6
? Fritillary	1			1
Silver-spotted Skipper <i>Epargyreus clarus</i>	3			3
Checkered Skipper <i>Pyrgus communis</i>		2		2
Delaware Skipper <i>Anatrytone logan</i>		1		1
? Hairstreak	1			1
? Comma	1	1		2
? Satyrid	1			1
Giant Swallowtail <i>Papilio cresphontes</i>	1			1
? Skipper	1	2	1	4
? Butterfly		1		1
? Nymphalid			1	1
TOTAL	717	87	81	885

Comparison between year count and 4th of July

Table 5 shows a comparison between data for the 2001 year and 4th of July Butterfly Count. Only data from the areas visited the same number of times (4) were compared. The 4th of July numbers are in black. Data for the entire year is in green. A dash (-) has been placed in columns where a species was present at the site during the year but not on the 4th of July Butterfly Count. This comparison was done to see how closely the 4th of July Butterfly Count represented the total individuals seen for the year.

In most cases the butterflies seen six times or more through the summer were also present in the 4th of July Count. Those butterflies with very low numbers (1,2 or 3) were sometimes seen in the 4th of July Count and sometimes not. Both 4th of July surveys noted about 24 percent of the individuals found for the year. At least for this year it appears the 4th of July count reflects the the more common butterflies present.

Table 5 All species of butterflies found in 2001 compared to 4th of July Count 2001.

SPECIES PRESENT	Tallgrass Trail 01	Tallgrass Trail 4th	Savanna Trail 01	Savanna Trail 4th
Black Swallowtail <i>Papilio polyxenes</i>	6		1	-
Eastern Tiger Swallowtail <i>Papilio glaucus</i>	11	1	6	-
Checkered White <i>Pontia protodice</i>	1	1		-
Cabbage White <i>Pieris rapae</i>	16	9		
Clouded Sulfur <i>Colias philodice</i>	28	9		1
Orange Sulfur <i>Colias eurytheme</i>	39	8	2	1
Little Yellow <i>Eurema lisa</i>	97	12	9	7
Gray Copper <i>Lycaena dione</i>	2	2		
Bronze Copper <i>Lycaena hyllus</i>	2	-		
American Copper <i>Lycaena phlaeas</i>				
Coral Hairstreak <i>Satyrium titus</i>	2	2		
Banded Hairstreak <i>Satyrium calanus</i>				
Edward's Hairstreak <i>Satyrium edwardsii</i>				
Gray Hairstreak <i>Strymon melinus</i>				
Spring Azure <i>Celastrina landon</i>	2	-	3	
Eastern Tailed-Blue <i>Everes comyntas</i>	68	53	8	7
Variiegated Fritillary <i>Euptoieta claudia</i>				
Great Spangled Fritillary <i>Syeyeria cybele</i>			4	-
Meadow Fritillary <i>Boloria bellona</i>	1	-		
Silvery Checkerspot <i>Chlosyne nycteis</i>				
Pearl Crescent <i>Phyciodes tharos</i>	201	33	16	5
Question Mark <i>Polygonia interrogationis</i>				
Eastern Comma <i>Polygonia comma</i>				
American Lady <i>Vanessa virginiensis</i>		36		
Painted Lady <i>Vanessa cardui</i>		-		-
Red Admiral <i>Vanessa atalanta</i>	149		2	-
American Snout <i>Libytheana carinenta</i>			1	1

Table 5 continued from previous page

SPECIES PRESENT	Tallgrass Trail 01	Tallgrass Trail 4th	Savanna Trail 01	Savanna Trail 4th
Common Buckeye <i>Junonia coenia</i>	2	-		
Red-spotted Purple <i>Limenitis arthemis astyanax</i>				
Viceroy <i>Limenitis archippus</i>	1	-		
Hackberry Emperor <i>Asterocampa celtis</i>			2	
Tawny Emperor <i>Asterocampa clyton</i>		-		2
Common Wood Nymph <i>Cercyonis pegala</i>				
Eyed Brown <i>Satyroides eurydice</i>				
Little Wood Satyr <i>Megisto cymela</i>				
Monarch <i>Danaus plexippus</i>	26	7	2	-
? Copper	1	-		
? Swallowtail	6	1		
? Fritillary	1	-		
Silver-spotted Skipper <i>Epargyreus clarus</i>	3	-		-
Checkered Skipper <i>Pyrgus communis</i>			2	
Delaware Skipper <i>Anatrytone logan</i>		-	1	-
? Hairstreak		1		
? Comma	1	1	1	-
? Satyrid	1	1		
Giant Swallowtail <i>Papilio cresphontes</i>	1	1		
? Skipper		-		-
? Butterfly			1	-
? Nymphalid				
TOTAL	717	174	87	24

KEY

T = Tallgrass Trail, S = Savanna Trail, Black = July 4th, Green = all summer
 - = species present at site during the year but not on Fourth of July Count Day

It should be noted this survey is only just that. While previous records may exist about butterflies found at this site none were found so no comparisons to previous years can be addressed. Next year will provide more data as to the number of species and individuals present. Butterfly numbers are usually in a state of flux as are all biological organisms depending upon rainfall, temperature and other species present. It will be interesting to see what shows up next year.

BIBLIOGRAPHY

- Glassberg, J. 1999. Butterflies through binoculars the East. Oxford University Press. Oxford New York. 242 pp.
- Heitzman, R.J. and J. E. Heitzman. 1987. Butterflies and moths of Missouri. Missouri Department of Conservation. 385 pp.
- Scott, J. A. 1986. The butterflies of North America. Stanford University Press, Stanford California. 583 pp.
- Shull, E.M. 1987. The butterflies of Indiana. Indiana Academy of Science, Bloomington, Indiana. 262 pp.
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