

**An Updated Comprehensive Annotated List
of the Butterflies (Lepidoptera: Rhopalocera)
Occurring at Chase Lake National Wildlife Refuge Complex
Stutsman County, North Dakota**

1995-1996

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This report is the product of a project funded by the Northern Prairie Science Center of the National Biological Service, U.S. Department of Interior, under a cooperative agreement with Minot State University. Field work for the project was completed between May and August, 1995 and 1996. A primary objective of the project was production of a comprehensive, site-specific butterfly list that could serve as a basis for future monitoring of butterfly populations and as an aid in making management decisions for the area.

Front cover: Photograph of Black Swallowtail, courtesy Bruce A. Hanson, Northern Prairie Science Center.

An Updated Comprehensive Annotated List of the Butterflies (Lepidoptera: Rhopalocera) Occurring at Chase Lake National Wildlife Refuge Complex Stutsman County, North Dakota

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Background of the Study

This is the second edition of a comprehensive butterfly list produced by the Northern Prairie Science Center of the National Biological Service, U. S. Department of the Interior, under cooperative agreement with the author and Minot State University. Field work for the project was completed in the summers of 1995 and 1996. A primary objective of the project was production of a comprehensive, site-specific butterfly list that could serve as a basis for future monitoring of populations and as an aid in making management decisions at the refuge.

Study Area and Sampling Procedures

The site of this study was lands within contiguous boundaries of the Chase Lake National Wildlife Refuge Complex in Stutsman County in central North Dakota. In 1995 two different sampling procedures were employed in an effort to confirm occurrence of as many species as possible. The two methods are referred to respectively as "Pollard transect" (or simply "transect") and "checklist" methods. In order to ensure adequate replication, only one Pollard transect (CL001) was employed in 1995. In 1996, the checklist method was dropped and a second transect route (CL002) was added. The two methods (1995) or transects (1996) were surveyed in an alternating pattern so that data could be compared statistically.

Both transects were rectangular (100m x 300m), totaling 800 meters in length, 5 meters in breadth, and 5 meters in height, and each was designed to traverse ecologically similar circumstances representative of the majority of terrain at the site. Both were located on WPA land, just north of the refuge proper in Section 4, T141N R69W. Each transect was marked off in flagged 10-meter segments and, where possible, with more permanent 50-meter reference posts (inverted metal electric fence posts).

For the checklist sampling method employed in 1995, a hypothetical list of regularly breeding resident species was first compiled for the site. The hypothetical list was derived from formal records for all included and adjacent counties. Excluded were occasional non-overwintering immigrant species. Native species for which it seemed likely that the absence of records represented incompleteness of information rather than actual absence were included in the hypothetical list and likewise in both editions of this list on the assumption that they will likely be confirmed at some time in the future. A separate reporting form was used for each checklist walk.

Each transect was represented schematically on the reporting form by a series of vertical linear scales, each divided into 10 segments corresponding to the 10-meter flagged segments on the ground. These scaled sections (0-100 meters) allow one to use the form to "walk" mentally through the transect and spatially envision each recorded encounter. Date, name of reporter, start time, finish time, temperature, estimated sunshine (10% increments), wind direction (eight points) and wind speed (Beaufort Scale) were all recorded at the finish of each transect walk. A separate reporting form was used for each transect walk.

Counting procedures for the two methods were identical in all respects except one, namely that in the transect method the recorder walked only along the designated transect route, whereas in the checklist method the recorder was free to wander at will. Procedures for 1996 transect counts were identical to those employed in 1995. Protocols for counting and recording in all situations generally followed Pollard and Yates (1993), *Monitoring Butterflies for Ecology and Conservation*:

- The sampling day extended from approximately 9 am until 5 pm.
- At the beginning of the day, a coin was flipped in order to determine which method or transect was to be employed first; methods or transects were thereafter alternated throughout the day.
- Butterflies were recorded with encoded four-letter acronyms (see appendix) later used in database management.
- No voucher specimens were collected within 100 meters of any point on a transect.
- The walking pace was steady and regular at approximately 35 meters per minute.
- Only butterflies actually seen within an estimated 2.5 meters on either side of the recorder, within 5 meters above the ground, and within 5 meters to the front were counted; butterflies behind the recorder or otherwise outside these limits were never counted.
- No active pursuit was undertaken, and no effort was made to find or to see butterflies hidden from view or perched out of sight of the recorder.
- A net was carried, and when problem individuals could be netted without undue difficulty or active pursuit, they were netted and released after identification had been made (in such cases, counting was stopped until the walk was resumed).
- Where distinction between two alternative species was not possible, the commoner of the two options (for that period of the season and the site in question) was recorded.
- For each case involving more than two such alternatives, identification was made to the lowest confident taxonomic level practicable.
- When individuals flew ahead of the recorder, when the recorder was certain that they had already been counted, they were ignored; if the recorder was uncertain, they were counted.

Data were collected by the author on the following dates:

Table I. Summary of butterfly counts at Chase Lake National Wildlife Refuge, 1995 and 1996

<u>Date</u>	<u>Transect Counts</u>	<u>Checklist Counts</u>
06-Jun-95	5	6
14-Jun-95	4	4
27-Jun-95	3	3
03-Jul-95	4	4
02-Aug-95	4	4
15-Aug-95	4	4

<u>Date</u>	<u>Transect CL001</u>	<u>Transect CL002</u>
14-Jun-96	2	1
26-Jun-96	3	2
04-Jul-96	3	3
15-Jul-96	4	4
02-Aug-96	3	3
09-Aug-96	4	4
22-Aug-96	4	4

Summary
 Total 1995: 49
 Total 1996: 44
 Both years: 93

Format of Listings

In the list which follows, each species is first identified on the left by common name, after which is given the Latin name (at the binomial level unless the trinomial is pertinent), including its original author (if parenthesized, under a different genus name) and the date of description. Next is a brief description of typical habitat, in some cases of adult food sources, etc. This information is followed by an indication of the principal larval host(s), where known, and that by information on adult phenology. All this material is followed by three abbreviated citations for works in which more detailed information may be located. The abbreviation consists in the last names of authors followed by the page numbers on which the main textual entries will be found. These reference works are as follows:

- Royer, Ronald Alan. 1988. *Butterflies of North Dakota: An Atlas and Guide*. Minot State University Science Monograph Number One.
- Opler, Paul A. and Krizek, George O. 1984. *Butterflies East of the Great Plains: An Illustrated Natural History*. The Johns Hopkins University Press. Baltimore. (For principally eastern taxa)
- Ferris, Clifford D. and Brown, F. Martin. 1981. *Butterflies of the Rocky Mountain States*. University of Oklahoma Press. Norman. (For principally western taxa)
- Scott, James A. 1986. *Butterflies of North America: A Natural History and Field Guide*. Stanford University Press. Stanford, California.

Finally, all of these resources are followed by a listing of specific encounters made during the present survey and/or any known historic records pertinent to Chase Lake National Wildlife Refuge. All records designated as "on transect" refer to the above-described rectangular Pollard transects in Section 4, T141N R69W. Elsewhere in the text, specific records are identified by legal description when referring to records not "on transect."

Butterflies of Chase Lake National Wildlife Refuge, North Dakota

Hesperiidae

Common Checkered Skipper

The Skippers

Pyrgus communis (Grote), 1872

Habitat: Open, dry, sunny ground

Larval food: Malvaceae

Adult flight: Spring immigrants yield at least one additional brood

References: Royer 18, Ferris & Brown 82, Scott 495

Confirmed occurrences: 27 Jun and 15 Aug 1995 in SW 1/4 S4 T142N R69W near Lake Louise.

Common Sooty Wing

Pholisora catullus (Fabricius), 1793

Habitat: Open spaces, bare soil, mud puddles, roadbeds

Larval food: Goosefoots and Amaranths

Adult flight: May-June and July-August

References: Royer 18, Opler & Krizek 218, Scott 498

Confirmed occurrences: Not recorded at Chase Lake Complex in 1995 or 1996, but on record for Stutsman and nearby counties, so a possible temporary resident in any year of strong southerly winds.

Garita Skipperling

Oarisma garita (Reakirt), 1866

Habitat: Open mid-grass prairie, likes legume and composite flowers

Larval food: Native prairie grasses, incl. *Stipa*, *Poa*, *Bouteloua*

Adult flight: One brood, Late May through June

References: Royer 21, Ferris & Brown 137, Scott 431

Confirmed occurrences: 14 Jun, 27 Jun, and 3 Jul 1995 on transect CL001 and elsewhere in S4 T142N R69W; common both transects 26 Jun and 4 Jul 1996.

Uncas Skipper

Hesperia uncas (W. H. Edwards), 1878

Habitat: Native mid-grass to short-grass prairie hilltops

Larval food: *Bouteloua gracilis*

Adult flight: Two broods, June and August

References: Royer 22, Ferris & Brown 124, Scott 435

Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but one male on transect CL001 on 9 Aug 1996.

- Common Branded Skipper** *Hesperia comma* (Linnaeus), 1758
Habitat: Prairie hilltops; very fond of *Liatris* blooms
Larval food: Native grasses and sedges
Adult flight: One brood, August
References: Royer 23, Ferris & Brown 125, Scott 436
Confirmed occurrences: Common on 15 Aug 1995 throughout S4 T142N R69W; abundant, almost swarming, on 22 Aug 1996 throughout complex.
- Ottoo Skipper** *Hesperia ottoe* (W. H. Edwards), 1866
Habitat: Ungrazed native prairie hilltops on *Echinacea* blooms
Larval food: *Andropogon* spp., also reported are *Bouteloua*, *Stipa*, *Poa*
Adult flight: One brood, mid-June into July
References: Royer 23, Ferris & Brown 128, Scott 437
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in shortgrass prairie hilltops in June and early July.
- Pawnee Skipper** *Hesperia pawnee* Dodge, 1874
Habitat: Undisturbed, often sandy native prairies on *Liatris* blooms
Larval food: Native grasses, esp. *Bouteloua*; *Stipa*, *Poa* also named in literature
Adult flight: One brood, early August
References: Royer 24, Ferris & Brown 129, Scott 438
Confirmed occurrences: common 15 Aug 1995 in eastern S4 T142N R69W; again common (especially on certain hilltops) on both transects and elsewhere in S4 T142N R69W, 22 Aug 1996.
- Dakota Skipper** *Hesperia dacotae* (Skinner), 1911
Habitat: Mesic tall-grass to mid-grass native prairies with *Zygadenus*
Larval food: Grasses, esp. *Andropogon scoparius*
Adult flight: One brood, mid-June to early July
References: Royer 25, Opler & Krizek 231, Scott 441
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible on northern slopes with *Zygadenus* in June and early July.
- Peck's Skipper** *Polites peckius* (Kirby), 1837
Habitat: Meadows with higher humidity, esp. on clover or alfalfa blooms
Larval food: Cutgrass (*Leersia oryzoides*), probably also *Poa*
Adult flight: One brood, mid-June into July
References: Royer 26, Opler & Krizek 231, Scott 444
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible near wetlands in June and early July, especially at alfalfa blossoms.

- Tawny-edged Skipper** *Polites themistocles* (Latreille), 1824
Habitat: Meadows and road ditches, esp. on alfalfa blooms
Larval food: Grasses, including *Poa*, *Panicum*
Adult flight: One brood, mid-June into July
References: Royer 26, Opler & Krizek 234, Scott 445
Confirmed occurrences: 27 Jun 1995 in eastern S4 T142N R69W; one example on transect CL001, 4 Jul 1996.
- Crossline Skipper** *Polites origenes* (Fabricius), 1793
Habitat: Ungrazed native prairie, *Echinacea* blooms
Larval food: Reportedly Purpletop (*Tridens flavus*); probably *Andropogon* in North Dakota
Adult flight: One brood, mid-June into July
References: Royer 27, Opler & Krizek 234, Scott 446
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible on hilltops in late June and early July, especially at *Echinacea* and other composite blossoms.
- Long Dash** *Polites mystic* (Edwards), 1863
Habitat: Marsh edges, wet meadows & ditches, esp. on alfalfa blooms
Larval food: Grasses, incl. *Poa*, *Agropyron*, *Phleum*
Adult flight: One brood, mid-June into July
References: Royer 27, Opler & Krizek 235, Scott 445
Confirmed occurrences: 27 Jun and 3 Jul 1995 in S4 T142N R69W; uncommon but present throughout both transects, 4 Jul through 2 Aug 1996.
- Arogos Skipper** *Atrytone arogos* (Boisduval & LeConte), 1834
Habitat: Mesic, undisturbed tall- to mid-grass native bluestem prairies
Larval food: *Andropogon gerardii*
Adult flight: One brood, mid-June into July
References: Royer 29, Opler & Krizek 240, Scott 449
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible on northern bluestem slopes in late June and early July.
- Delaware Skipper** *Atrytone logan* (Edwards), 1863
Habitat: Open grasslands; loves thistle blooms
Larval food: Grasses, incl. *Andropogon*, *Panicum*, *Erianthus*
Adult flight: One brood, mid-June into July
References: Royer 29, Opler & Krizek 241, Scott 449
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but one example on transect CL001 on 15 Jul 1996.

- Dun Skipper** *Euphyes ruricola* (Boisduval), 1852 (= *vestris* (Boisduval), 1852)
Habitat: Pastures, *Monarda* stands, lower areas in prairie
Larval food: Sedges, incl. various *Carex* spp., *Cyperus esculentus*
Adult flight: One brood, July
References: Royer 31, Opler & Krizek 252, Scott 456
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in brushy areas and at *Monarda* stands throughout July.
- Dusted Skipper** *Atrytonopsis hianna* (Scudder), 1868
Habitat: South-facing grassland slopes, bluestem prairies
Larval food: *Andropogon scoparius*
Adult flight: One brood, May into early June
References: Royer 32, Opler & Krizek 253, Scott 457
Confirmed occurrences: 14 Jun 1995 on transect CL001 and in S10 T142N R69W (state trust land); again common 14 Jun 1996 on transect CL001.
- Papilionidae**
The Swallowtails
- Black Swallowtail** *Papilio polyxenes* (Fabricius), 1775
Habitat: Gardens, prairie hilltops, always near Umbelliferae
Larval food: Wild Umbelliferae, incl. *Daucus*, *Zizia*
Adult flight: Two broods, May and July
References: Royer 35, Opler & Krizek 44, Scott 171
Confirmed occurrences: 6 and 14 Jun 1995 on windswept prairie hilltops throughout S4, S9 and S10 in T142N R69W.
- Canadian Tiger Swallowtail** *Pterourus canadensis* (Rothschild & Jordan), 1906
Habitat: Ash breaks, woodlands; often found on *Apocynum* blooms
Larval food: *Populus*, *Salix*, possibly also *Prunus*
Adult flight: One brood, early June
References: Royer 37, Opler & Krizek 49, Scott 179
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible occasional encounters during early June.
- Pieridae**
The Whites and Sulphurs
- Checkered White** *Pontia protodice* (Boisduval and LeConte), 1829
Habitat: Disturbed open areas
Larval food: Cruciferae, incl. *Lepidium*, *Capsella*, *Barbarea*
Adult flight: Two, sometimes three broods, May, July, September
References: Royer 39, Opler & Krizek 56, Scott 182
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible immigrant in any year.

- Western White** *Pontia occidentalis* (Reakirt), 1866
Habitat: Open prairie, especially on hilltops
Larval food: Cruciferae, incl. *Lepidium*, *Arabis*, *Sisymbrium*
Adult flight: Two broods, May, July
References: Royer 39, Ferris & Brown 150, Scott 222
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible immigrant in any year.
- European Cabbage Butterfly** *Artogeia rapae* (Linnaeus), 1758
Habitat: Ubiquitous in gardens and roadsides in agricultural areas
Larval food: Cruciferae, occasionally also Capparidaceae
Adult flight: Multiple broods, May-September
References: Royer 40, Opler & Krizek 59, Scott 216
Confirmed occurrences: 6 Jun and 3 July 1995 in NE 1/4 S4 T142N R69W and abundant 15 Aug 1995 throughout S4 T142N R69W; much less common than previous year, but evident throughout complex on 22 Aug 1996.
- Olympia Marble** *Euchloe olympia* (W. H. Edwards), 1871
Habitat: Prairies and sage flats
Larval food: Cruciferae, incl. *Arabis*, possibly also *Sisymbrium*
Adult flight: One brood, May
References: Royer 41, Opler & Krizek 157, Scott 215
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in May and early June.
- Clouded Sulphur** *Colias philodice* Godart, 1819
Habitat: Ubiquitous in agricultural areas
Larval food: Legumes, esp. *Trifolium* spp., *Medicago* and *Melilotus*
Adult flight: Multiple broods, May-September
References: Royer 42, Opler & Krizek 64, Scott 198
Confirmed occurrences: Common in all areas of the complex throughout the 1995 season, peaking in early June and again in early August; uncommon but continuously present throughout 1996 season.
- Orange Sulphur** *Colias eurytheme* Boisduval, 1852
Habitat: Common in agricultural areas, though less so than *philodice*
Larval food: Legumes, esp. *Medicago*, also *Melilotus*
Adult flight: Multiple broods, May-September
References: Royer 42, Opler & Krizek 65, Scott 196
Confirmed occurrences: Intermittent but uncommon during second half of summer throughout S4 T142N R69W; again uncommon in 1996 season, with one example on transect CL001, 22 Aug 1996.

Lycaenidae
Great Copper

The Gossamer Wings

Gaeides xanthoides (Boisduval), 1852

Habitat: Prairie meadows, ditches, disturbed areas

Larval food: *Rumex obtusifolius*

Adult flight: One brood, late June through July

References: Royer 47, Opler & Krizek 83, Scott 391

Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but one worn male on transect CL001 on 9 Aug 1996..

Bronze Copper

Hylolycaena hyllus (Cramer), 1775

Habitat: Open wet meadows with *Polygonum* or *Rumex*, pond margins, marshes, usually with neutral to alkaline soil pH

Larval food: *Rumex crispus*, *R. obticulatus*, *Polygonum* spp.

Adult flight: Two broods, June and August

References: Royer 47, Opler & Krizek 84, Scott 388

Confirmed occurrences: 27 Jun 1995 in NE 1/4 S4 T142N R69W.

Purplish Copper

Epidemia helloides (Boisduval), 1852

Habitat: Wastelands, wet ditches, open fields; a vagile species

Larval food: *Rumex* spp., *Polygonum* spp.

Adult flight: Two broods, June and August

References: Royer 49, Opler & Krizek 86, Scott 389

Confirmed occurrences: 27 Jun 1995 NE 1/4 S4 T142N R69W.

Coral Hairstreak

Harkenclenus titus (Fabricius), 1793

Habitat: Scrub, esp. with *Prunus*, *Crataegus* and *Asclepias*

Larval food: *Prunus* spp.

Adult flight: One brood, July into August

References: Royer 50, Opler & Krizek 89, Scott 360

Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in *Prunus/Amelanchier* thickets from late June through August.

Acadian Hairstreak

Satyrium acadicum (Fabricius), 1793

Habitat: Willow scrub in moist areas

Larval food: *Salix* spp.

Adult flight: One brood, late June, July

References: Royer 50, Opler & Krizek 90, Scott 361

Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in moist areas with willows from late June throughout July.

- Striped Hairstreak** *Satyrium liparops* (LeConte), 1833
Habitat: Oak woodlands, wooded breaks or thickets that include *Amelanchier*, *Prunus*, *Crataegus*; especially fond of *Melilotus alba*, *Gypsophila* blooms
Larval food: Rosaceae, incl. *Prunus*, *Crataegus*, *Amelanchier*, etc.
Adult flight: One brood, late June, July
References: Royer 52, Opler & Krizek 94, Scott 362
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in *Prunus/Amelanchier* thickets from late June throughout July.
- Gray Hairstreak** *Strymon melinus* Hübner, 1818
Habitat: Brushy, weedy disturbed open areas; occasional
Larval food: Widely varied, incl. *Astragalus*, *Polygonum*, *Malva*
Adult flight: Two or three broods, May, July, September
References: Royer 54, Ferris & Brown 264, Scott 383
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible anywhere from mid-summer onward.
- Spring Azure** *Celastrina argiolus* Linnaeus, 1758
Habitat: Most often associated with *Amelanchier* blooms in spring, *Cornus* in summer
Larval food: *Prunus* in west; *Cornus*, *Viburnum*, etc. in north and east. This is actually a complex of sibling species the systematics of which are currently being worked out. We probably have two species in ND, differentiated by their larval hosts.
Adult flight: The eastern taxon is bivoltine, flying in May and again in July; the western taxon is univoltine, flying only in May.
References: Royer 56, Ferris & Brown 221, Opler & Krizek 116, Scott 396
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in *Prunus* areas in May.
- Silvery Blue** *Glaucopsyche lygdamus* (Doubleday), 1841
Habitat: Open areas in or near woodlands
Larval food: Legumes, incl. *Lupinus*, *Astragalus*, *Hedysarum*
Adult flight: Widespread, late May through June, one brood only
References: Royer 56, Opler & Krizek 119, Scott 399
Confirmed occurrences: 6 Jun, 14 Jun and 27 Jun 1995 along west shore of Lake Louise in NW 1/4 S10 T142N R69W.

Melissa Blue

Lycaeides melissa (Doubleday), 1841

Habitat: Open prairies

Larval food: Legumes, incl. *Lupinus*, *Astragalus*, *Oxytropis*, *Glycyrrhiza*

Adult flight: Two broods, June and August

References: Royer 56, Ferris & Brown 202, Scott 407

Confirmed occurrences: Abundant throughout the complex from 14 Jun through 3 Jul 1995, with a second brood evident on 15 Aug 1995; uncommon but present throughout 1996 season on both transects.

Nymphalidae
Variegated Fritillary

The Brush-footed Butterflies

Euptoleta claudia (Cramer), 1775

Habitat: Southern migrant, often common in open prairies

Larval food: A wide range of seemingly unrelated plant spp., incl. *Viola*, *Portulaca*, *Desmodium*, *Menispermum*

Adult flight: Continuous breeder arriving in May, often abundant by fall

References: Royer 62, Opler & Krizek 130, Scott 335

Confirmed occurrences: 2 Aug 1995 on transect CL001.

Great Spangled Fritillary

Speyeria cybele (Fabricius), 1775

Habitat: Woodland margins, often nectaring *Cirsium*, *Monarda* or *Liatris*

Larval food: *Viola* spp. (larva overwinters shortly after eclosure)

Adult flight: Late June into early August

References: Royer 63, Opler & Krizek 132, Scott 325

Confirmed occurrences: Rare, with one individual each on 3 Jul, 2 Aug and 15 Aug 1995 in S4 T142N R69W. All three were females obviously in transit; two examples on transect CL001, 15 Jul 1996.

Aphrodite Fritillary

Speyeria aphrodite (Fabricius), 1787

Habitat: Open meadows, nectars at *Cirsium*, *Monarda*, *Liatris*, males patrol continuously when not taking nectar or resting

Larval food: *Viola* spp. (larva overwinters shortly after eclosure)

Adult flight: Late June into early August, depending on location

References: Royer 63, Opler & Krizek 133, Scott 324

Confirmed occurrences: Common throughout complex on 2 and 15 Aug 1995, males patrolling and taking nectar at *Liatris punctata*; again present but strangely scarce throughout 1996 season.

- Regal Fritillary** *Speyeria idalia* (Drury), 1773
Habitat: Native prairies in southeastern ND; nectars at *Asclepias*, *Cirsium*, *Liatris*; males patrol continuously when not taking nectar or basking; females range widely and delay egg laying until late August
Larval food: *Viola pedata* (larva overwinters shortly after eclosure)
Adult flight: Late June (males) through August (females dominating)
References: Royer 63, Opler & Krizek 133, Scott 324
Confirmed occurrences: Common throughout complex on 2 and 15 Aug 1995, especially around *Cirsium* stands, and obviously a resident (several females observed during oviposition behavior); not appearing until 15 Jul 1996, when less common and averaging much smaller than previous year.
- Callippe Fritillary** *Speyeria callippe* (Boisduval), 1852
Habitat: Native prairies; nectars avidly at *Medicago*, *Cirsium*
Larval food: *Viola* spp. (larva overwinters in 1st stage)
Adult flight: Mid-June into July (earlier than most *Speyeria* spp.)
References: Royer 64, Ferris & Brown 307, Scott 329
Confirmed occurrences: Common throughout complex 27 Jun, 3 Jul, 2 Aug, but worn by 15 Aug 1995; common on both transects, 26 Jun through 15 Jul 1996 (abundant on 4 Jul); still evident through early August 1996.
- Silver-bordered Fritillary** *Clossiana selene* (Denis & Schiffermüller), 1775
Habitat: Wet meadows, marshes, lake margins, often with woody growth (*Salix*, *Cornus*); males are incessant fliers
Larval food: *Viola* spp. (larva overwinters in 2nd-4th stage)
Adult flight: Two broods, May and July
References: Royer 64, Ferris & Brown 307, Scott 329
Confirmed occurrences: Common in fen in NE 1/4 S4 T142N R69W.
- Meadow Fritillary** *Clossiana bellona* (Fabricius), 1775
Habitat: Fresh meadows, usually those without much woody growth; males patrol during mid-day
Larval food: *Viola* spp. (larva overwinters in 3rd or 4th stage)
Adult flight: Two broods, May and July
References: Royer 66, Opler & Krizek 138, Scott 320
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but remotely possible in fresh wetland areas in May and July.
- Gorgone Checkerspot** *Charidryas gorgone* (Hübner), 1810
Habitat: Dry prairies, disturbed fields, roadsides; likes mud puddles
Larval food: *Helianthus* spp. (larva overwinters in 3rd stage)
Adult flight: Two broods, June and August
References: Royer 66, Opler & Krizek 140, Scott 303
Confirmed occurrences: 6 and 14 Jun 1995 in S4 T142N R69W.

- Pearl Crescent** *Phyciodes tharos* (Drury), 1773
Habitat: Sunny places, roadsides, widespread
Larval food: *Aster* spp.
Adult flight: Multiple broods; May, June-July, August-September
References: Royer 69, Opler & Krizek 145, Scott 311
Confirmed occurrences: 6 and 14 Jun, and again 2 August 1995 on transect CL001 and intermittently throughout S4 T142N R69W; not common; similarly scarce, with only two examples on transect CL001, 15 Jul 1996.
- Northern Pearl Crescent** *Phyciodes pascoensis* Wright, 1905
Habitat: Moist woodland roadsides, often near water
Larval food: *Aster* spp., probably *A. simplex* in ND
Adult flight: One brood, June
References: Royer 69, Opler & Krizek 147, Scott 309
Confirmed occurrences: 27 Jun and 3 Jul 1995 on transect CL001 but more commonly in low areas near water; not common.
- Mourning Cloak** *Nymphalis antiopa* (Linnaeus), 1758
Habitat: Riparian forests; adults drink *Quercus* sap and fermenting fruit juices, and occasionally the nectar of such flowers as *Asclepias*, *Apocynum*, etc.
Larval food: *Salix* spp. primarily, but also *Populus*, *Betula*, *Ulmus*
Adult flight: Overwinters as adult, appearing April-May to produce a single annual brood by early July. Partially southward migratory; adults live nearly a year
References: Royer 74, Opler & Krizek 156, Scott 291
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible anywhere in complex; overwintering individual through May, then new emergents after July.
- Milbert's Tortoise Shell** *Aglais milberti* (Godart), 1819
Habitat: Widespread across the state in autumn
Larval food: *Urtica* and *Salix* spp. also possibly *Helianthus*
Adult flight: Confused; one to four broods reported; probably two in ND
References: Royer 75, Opler & Krizek 157, Scott 289
Confirmed occurrences: One example on transect CL001, 27 Jun 1995.
- Painted Lady** *Vanessa cardui* (Linnaeus), 1758
Habitat: Open prairies, roadsides and meadows
Larval food: *Cirsium* primarily; also *Helianthus*, many other composites
Adult flight: Frequent spring immigrant; does not survive winter
References: Royer 76, Opler & Krizek 159, Scott 289
Confirmed occurrences: Intermittent throughout complex all season, peaking markedly in mid-August; 2 Aug 1996 on transect CL001.

- Red Admiral** *Vanessa atalanta* (Linnaeus), 1758
Habitat: Sunlit patches in woodland clearings near nettles
Larval food: *Urtica*
Adult flight: Regular spring immigrant; does not survive winter
References: Royer 76, Opler & Krizek 160, Scott 280
Confirmed occurrences: Uncommon on 27 Jun and 3 Jul 1995 on transect CL001 and elsewhere in S4 T142N R69W.
- Buckeye** *Junonia coenia* (Linnaeus), 1758
Habitat: Open prairies
Larval food: *Plantago*, also various Scrophulariaceae and Verbenaceae
Adult flight: Infrequent immigrant, may produce one or two broods in north, depending on arrival time; does not survive winter
References: Royer 77, Opler & Krizek 162, Scott 276
Confirmed occurrences: 27 Jun and 3 Jul 1995 in S4 T142N R69W.
- White Admiral** *Basilarchia arthemis* (Drury), 1773
Habitat: Woodland margins, often at *Monarda* or *Apocynum* blooms
Larval food: Varied, mostly *Populus*; also *Crataegus*, *Tilia*, *Amelanchier*
Adult flight: One brood, late June through July
References: Royer 77, Opler & Krizek 166, Scott 260
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible anywhere in complex from mid-June through July.
- Viceroy** *Basilarchia archippus* (Cramer), 1776
Habitat: In or near wet meadows with willows
Larval food: *Salix*, possibly sometimes *Populus*
Adult flight: Double-brooded, appearing in early June and early August
References: Royer 78, Opler & Krizek 167, Scott 259
Confirmed occurrences: Not recorded at Chase Lake Complex in 1995, but possible in willow areas in mid-June and again in August.
- Satyridae**
Northern Eyed Brown **The Satyrs & Wood Nymphs**
Satyrodes eurydice (Johansson), 1763
Habitat: Open sedge meadows and marshlands
Larval food: Primarily *Carex* spp.
Adult flight: One brood, primarily in July
References: Royer 80, Opler & Krizek 178, Scott 235
Confirmed occurrences: Common in fen, NE1/4, S4 T142N R69W, 14 Jul 1996 (new to list in 1996).

- Inornate Ringlet** *Coenonympha inornata* Edwards, 1861
Habitat: Open, grassy meadows and native prairies
Larval food: Doubtless many grass species are utilized
Adult flight: One brood, primarily in late May and June
References: Royer 81, Opler & Krizek 186, Scott 239 (as *tullia*)
Confirmed occurrences: Abundant throughout complex, from 6 June through early July, 1995; common, 14 and 26 June and 4 Jul 1996 throughout complex.
- Common Wood Nymph** *Cercyonis pegala* (Fabricius), 1775
Habitat: Native prairies and grasslands
Larval food: *Andropogon*, *Stipa*; many grasses are no doubt utilized
Adult flight: One brood, primarily in July and August
References: Royer 82, Opler & Krizek 186, Scott 240
Confirmed occurrences: Abundant throughout complex, from mid-July through mid-August; appearing 24 Jun 1996 and flying throughout complex well into August.
- Varuna Arctic** *Oeneis uhleri varuna* (W. H. Edwards), 1882
Habitat: TL = "Plains of Dakota Territory"; well drained prairie slopes
Larval food: Unknown grass sp.
Adult flight: One brood, mid-May into June
References: Royer 84, Ferris & Brown 284, Scott 250
Confirmed occurrences: Common throughout prairie hills on 6 and 14 Jun 1995; uncommon on transect CL001, absent on transect CL002, 14 Jun 1996.
- Danaidae Monarchs** **The Milkweed Butterflies**
Danaus plexippus (Linnaeus), 1758
Habitat: Widespread immigrant
Larval food: *Asclepias* spp.
Adult flight: Sparse northward immigration in spring results in multiple broods; southward fall migrations can be quite spectacular
References: Royer 85, Opler & Krizek 193, Scott 229
Confirmed occurrences: 14 Jun and 2 Aug 1995 in central S4 T142N R69W; one example on transect CL002, 22 Aug 1996.