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MOTHS OF OAK-HICKORY FORESTS AND PLANTED TALLGRASS PRAIRIES ON LUTHER COLLEGE NATURAL AREAS IN DECORAH, IOWA

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ABSTRACT. Moths are often specialists of particular host plants, making them good indicators of what plants are present in a habitat, as well as the overall health and diversity of an ecosystem. Moths are important pollinators, and their caterpillars are an important food source for many species of birds. The objective of this study was to compare the abundance, species richness, and structure of moth assemblages in planted tallgrass prairies and oak hickory forests in Decorah, Iowa. During the summer of 2018, black light bucket traps were set up in three planted prairies and three oak-hickory forests on five nights from early June to mid-September. Moth samples were brought back to the lab, frozen, then sorted and counted. Representatives of each species of moth were pinned, spread, and identified to species. We collected a total of 12,290 moths, representing 468 species and 34 families. There were significantly more moths, families of moths, and moth species in the forests than in the prairies. Among sample dates over the course of the summer, there were no significant differences in either number of moths or species richness. This study provides valuable baseline data for monitoring future changes in moth diversity and abundance in Northeast Iowa.

Additional key words: Lepidoptera, moth diversity, black light traps

Moths are primarily herbivorous-often specialists of particular host plants (Brues 1920, Miller 1993, Wagner 2005, Bulman 2007). This host specialization, combined with their diverse taxa, relative abundance, and ease of capture and identification makes moths good ecological indicators of vegetation diversity (Kitching et al. 2000) and changes in the environment (Conrad et al. 2006, Ràkosy & Schmitt 2011). Despite their abundance and diversity, moths have been unevenly surveyed (Summerville et al. 2007, Harrison and Berenbaum 2013). Most studies have focused on invasive species such as the gypsy moths (Whitmire & Tobin 2006) or agricultural pest species such as the codling moth (Martin et al. 2014). Globally, lepidopterans have declined in abundance by 30% since 1970, often due to landscape development and loss of habitat (Haddad & Wagner 2017), making it even more important that baseline data in areas around the world are gathered before their numbers potentially decrease further.

Previous insect biodiversity studies in northeast Iowa have focused on butterflies (Larsen & Bovee 2001, Powers & Larsen 2014, Wittman et al. 2017, Stivers et al. 2019), ground beetles (Larsen & Williams 1999, Larsen et al. 2003, Larsen & Work 2003), scarab beetles (Worthington & Larsen 2010) and native bees (Jensen & Larsen unpublished data). However, to our knowledge, there has been only one published survey of moths in northeast Iowa (Porter 1908), which reports finding 271 species of moths in the Decorah area.

Repeated sampling over the long-term allows us to monitor changes in populations and can be used to indirectly track changes to the environment and detect declines that would be otherwise hard to spot with only year-long data pools. This study is intended to provide valuable baseline data for future long-term surveys. Therefore, the objective of this study was to compare the abundance, species richness, and composition of moth communities in planted tallgrass prairies and oak-hickory forests in the Decorah area.

MATERIALS AND METHODS

Site Description. Moths were sampled from three planted tallgrass prairies (Anderson Prairie, Jewell Prairie, and Gateway Prairie) and three oak-hickory forests (Spilde Woods, Hickory Ridge Woods, and Lionberger Environmental Preserve) on the Luther College campus in Decorah, Iowa. Anderson Prairie (24.7 ac) was planted in 1998 and expanded in 1998, and contains 71 species of native grasses and forbs (Jensen & Larsen in review). Gateway Prairie (39.3 ac) was planted in 2005 and contains 66 species of native plants. Jewell Prairie (22.5 ac) was planted in 2011 and contains 61 species of plants. All three prairies are managed through periodic prescribed burning and mowing. Hickory Ridge Woods (83 ac), Spilde Woods (17 ac), and Lionberger Environmental Preserve (176 ac) are all predominantly deciduous, mature hardwood forests.

Forest Tree Sampling. Trees at each of the moth trap locations in the three oak-hickory forest sites were identified and measured. Nine 200 m^2 plots were established at each black light trap site. Within each plot, trees were identified to species, and their diameter at breast height (dbh) was measured for all trees larger than 3 cm dbh. Using these data, density and dominance of tree species at each forest site were calculated.

Moth Sampling. Moths were collected using battery-powered universal black light bucket traps

(BioQuip, Rancho Dominguez, CA, model 2851T) placed overnight at each sample site on five nights in 2018: June 5–6, June 24–25, July 17–18, August 7–8, and September 13–15. Each trap was placed near the middle of the prairie or woods. Traps were placed in at least one pair of prairie and forest sites each night over two sequential nights of sampling to cover all six sites and to minimize differences in weather, temperature, and moonlight when comparing habitat types between different nights. Once captured, moths were knocked down with ethyl acetate fumes in the bucket, then samples were frozen until moths could be sorted, counted, and mounted for identification.

Moth ID and Analysis. In the lab, moths were sorted by external morphology, counted, and representatives of each moth species were pinned, spread, and identified to species using Moth Photographers Group (2020) and Insects of Iowa (Durbin 2018) websites. The Insects of Iowa website is the best information available on Iowa county and state records. Species names were standardized using the Moth Photographers Group website. Voucher specimens of each moth species are housed in the insect research collection of the Hoslett Museum of Natural History, Luther College, Decorah, Iowa. Moth abundance and species richness among habitat types, sites, and dates were compared using an independent samples t-test or one-way analysis of variance, and a principal-components analysis (PCA) was used to differentiate moth assemblages among the six sites. Only identified moths were used in analyses.

RESULTS

Forest Tree Sampling. A total of 18 species of trees were identified. We found 14 species of trees in the sample area in Hickory Ridge Woods. The sample area was dominated by shagbark hickory, *Carya ovata* (Mill.) K. Koch (16.87 m^2/ha), which made up 63% of the basal area of the trees in the area sampled. Red oak, *Quercus rubra* L. (3.21 m^2/ha) made up 12% of the basal area and bitternut hickory *Carya cordiformis* (Wangenh.) K. Koch (2.39 m^2/ha) made up 8%. The remaining 17% of the basal area was a combination of black cherry, *Prunus serotina* Ehrh. (1.34 m^2/ha), white oak, *Quercus alba* L. (1.23 m^2/ha), ironwood, *Ostrya virginiana* (Mill.) K. Koch (0.64 m^2/ha), elms, *Ulmus spp.* (0.46 m^2/ha), *Celtis occidentalis* L. (0.33 m^2/ha), sugar maple, *Acer saccharum* Marshall (0.15 m^2/ha), black walnut, *Juglans nigra* L. (0.12 m^2/ha), white ash, *Fraxinus americana* L. (0.03 m^2/ha), *Prunus virginiana* L. (0.03 m^2/ha), Eastern red cedar, *Juniperus virginiana* L. (0.01 m^2/ha), and European buckthorn, *Rhamnus cathartica* L. (0.01 m^2/ha).

Spilde Woods contained 13 species of trees, and was mainly dominated by bur oak, *Quercus macrocarpa* Michx. (12.26 m^2/ha) which made up 38% of the basal area of the site, followed by *Ulmus spp.* (5.29 m^2/ha; 16%), *C. ovata* (5.01 m^2/ha; 15%), *C. occidentalis* (3.65 m^2/ha; 11%), and *Q. rubra* (3.24 m^2/ha; 10%). The remaining 8% of basal area was made up of *O. virginiana* (0.67 m^2/ha), *J. nigra* (0.51 m^2/ha), *C. cordiformis* (0.18 m^2/ha), *P. serotina* (0.13 m^2/ha), *J. virginiana* (0.05 m^2/ha), box elder, *Acer negundo* L. (0.03 m^2/ha), and *F. americana* (0.003 m^2/ha).

We found 14 species of trees in the sample area at Lionberger environmental preserve. Lionberger was not dominated by a single species, but had four species between 10–17% basal area. Red oak, *Q. rubra* 6.52 m^2/ha) had the highest dominance, making up 17% of the basal area of the site. Elms, *Ulmus spp.* (5.49 m^2/ha; 14%), black walnut, *J. nigra* (3.90 m^2/ha; 10%), white oak, *Q. alba* (3.75 m^2/ha; 10%), bur oak, *Q. macrocarpa* (3.68 m^2/ha; 9%), shagbark hickory, *C. ovata* (3.44 m^2/ha; 9%), basswood, *Tilia americana* L. (2.58 m^2/ha; 6%), sugar maple, *A. saccharum* (2.16 m^2/ha; 6%), and *O. virginiana* (2.12 m^2/ha; 5%) also all had relatively similar levels of dominance. The remaining 15% of the basal area was made up of five species; *J. virginiana*

TABLE 1. A summary comparison of moths collected from planted tallgrass prairie and oak-hickory forest habitats during the summer of 2018 from six sites at Luther College, Decorah, Iowa.

	Prairies	**Forests**	**Overall**
Total number of moths collected	2617	9673	12290
Number of unidentifiable moths	632	2098	2730
Number of moths identified	1985	7575	9560
Number of families identified	19	30	34
Number of families unique to habitat	4	15	
Number of species identified	220	391	468
Number of species unique to habitat	77	248	

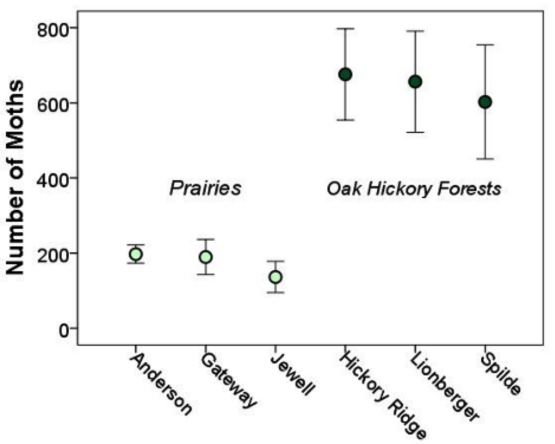

Fig. 1. Moth abundance (mean ± SE) from three planted tallgrass prairies and three oak-hickory forests averaged over the five sampling dates during the summer of 2018 in Luther College, Decorah, Iowa. Means of sites within each habitat type are not significantly different, but do differ between planted prairies and oak-hickory forest (LSD multiple comparison of means, $\alpha = 0.05$).

(1.43 m²/ha), *C. occidentalis* (1.29 m²/ha), pin oak, *Quercus palustris* Münchh. (0.55 m²/ha), *C. cordiformis* (0.06 m²/ha), and *F. americana* (0.01 m²/ha).

Moth Sampling. Over our five sample dates at six sites we collected a total of 12,290 moths. Of these, we were able to identify 9,560 moths (77.8%), representing 34 families and 468 species (Table 1, Appendix). Over the course of the summer, there were no significant differences in overall moth abundance ($F=0.807$; $df=5,24$; $p=0.532$) or moth species richness ($F=1.329$; $df=5,24$; $p=0.287$) among the five sample dates.

However, both moth abundance ($t=16.173$; $df=4$; $p<0.001$) and moth species richness ($t=8.984$; $df=4$; $p=0.001$) were significantly higher in the oak-hickory forest sites than in the prairie sites. Over all dates combined, the prairie sites had an average of 872 (± 95.8 S.E.) moths collected with an average of 129 (± 1.4) moth species at each prairie site. The oak-hickory forest sites had four times more moths over the summer, an average of 3,224 (± 109.4) moths and twice as many species, with an average of 251 (± 13.6) species of moths at each forest site. There were significant differences in the average number of moths collected among the six sites ($F=6.695$; $df=5,24$; $p<0.001$), however, the three sites sharing the same type of habitat (i.e., prairies or forests) did not significantly differ (LSD multiple comparison of means, $\alpha=0.05$) for moth abundance (Fig. 1) or species richness (Fig. 2).

Hickory Ridge Woods had both the highest moth abundance and species richness of all locations, yielding a total of 3,379 moths and 275 species collected over the course of the summer (Fig. 1, Fig. 2). Jewell Prairie had the lowest abundance with only 682 moths, while Gateway Prairie had the lowest species richness, yielding 128 species of moths (Fig. 1, Fig. 2). Our 468 species of identified moths (Appendix) include 7 state records and 97 county records (www.insectsofiowa.org). The five most abundant moths in the prairies were *Crambidia pallida* (Packard, 1864) (n=145), *Lacinipolia renigera* (Stephens, 1829) (n=113), *Phragmatobia assimilans* Walker, 1855 (n=84), *Feltia tricosa* (Lintner, 1874) (n=56), and *Apantesis phalerata* (Harris, 1841) (n=50). The five most abundant moths in the forests were *Argyrotaenia juglandana* (Fernald, 1879) (n=401), *Pseudeustrotia carneola* (Guenée, 1852) (n=389), *Nematocampa resistaria* (Herrich-Schäffer, [1856]) (n=263), *Archips grisea* (Robinson, 1869) (n=263), and *Herpetogramma thestealis* (Walker, 1859) (n=253).

Principal-components analysis (PCA) graphically places similar moth assemblages from different locations in close proximity to one another (Fig. 3). The moth assemblages of the three planted tallgrass prairies were remarkably similar. The moth composition of the oak-hickory forest moth assemblages were distinct from the prairie moth assemblages, and varied more in moth species present among the three oak-hickory forest sites. Principal component 1 explained 35.3% of the variation and was most highly correlated with the abundance of *Leuconycta lepidula* (Grote, 1874) (0.995), *Cenopis niveana* (Walsingham, 1879) (0.988), and *Anavitrinella pampinaria* (Guenée, [1858]), *Nadata*

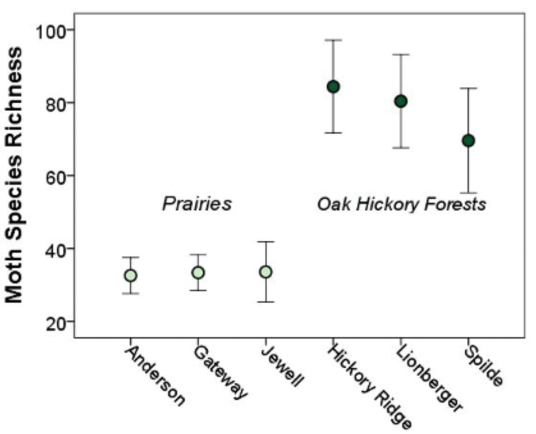

Fig. 2. Moth species richness (mean ± SE) from three planted tallgrass prairies and three oak-hickory forests averaged over five sampling dates during the summer of 2018 in Luther College, Decorah, Iowa. Means of sites within each habitat type are not significantly different, but do differ between planted prairies and oak-hickory forests (LSD multiple comparison of means, $\alpha = 0.05$).

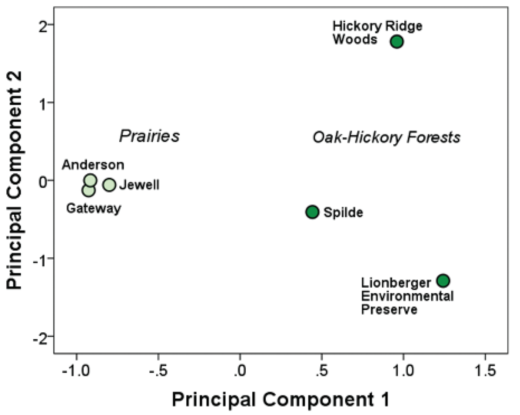

FIG. 3. PCA analysis of moth assemblages from three tallgrass prairies and three oak-hickory forests indicating distinct prairie and forest moth assemblages between habitat type and differences within forest sites.

gibbosa (Smith, 1797), *Clemensia albata* Packard, 1864, and *Zanclognatha obscuripennis* (Grote, 1872) (all at 0.986). Principal component 2 explained an additional 22.7% of the variation and was most highly correlated with the moths *Pediasia trisecta* (Walker, 1856) (0.944), *Noctua pronuba* (Linnaeus, 1758) (0.908), *Iridopsis ephyraria* (Walker, 1860) (0.880) and *Pseudorthodes vecors* (Guenée, 1852) (0.873). Another way to explain these differences is that 77 species of moths were found only in planted prairies, and 248 species of moths were found only in the oak-hickory forest samples (Table 1).

DISCUSSION

We found the moth assemblages of planted tallgrass prairies and oak-hickory forests differ dramatically in northeast Iowa. This was likely due to the difference in plant diversity and structure between the planted prairies and forested areas. All three prairies, although planted at different times, used similar seed mixes of grasses and forbs. The oak-hickory forest sites were found to have 13–14 species of trees near the trapping sites, and more species of herbaceous understory vegetation and shrubs. In another area of Hickory Ridge Woods, there were 37 species of forbs, plus several additional shrub and vine species. In Flying Squirrel Forest adjacent to Spilde Woods, 54 herbaceous species plus 27 woody species (vines, shrubs, and trees) have been documented (M. McNicoll, pers. comm.). The larger biomass and more complex physical structure of the trees, vines, and shrubs of these forests in addition to the herbaceous grasses, sedges, and forbs of the prairies most likely support a greater variety of herbivores than the relatively simpler plant community structure of the prairies. Moth abundance and species richness has been found to be greatly influenced by tree diversity (Summerville & Crist 2004). Moth community composition, on the other hand, has been found to vary more with forest size (Summerville & Crist 2004). This is consistent with our findings, since the moth communities in the forests were more variable while the sites varied greatly in size (17, 83, and 176 acres), whereas the moth communities in the prairies were similar in more similarly sized sites (22.5, 24.7, and 39.3 acres).

Management practices have been found to affect the abundance and species richness of moth populations as well. Mangels et al. (2017) suggest that an increase of mowing, grazing, and fertilizer use in grasslands can lead to a decrease in moth abundance and species richness, as well as an increase in generalist moths and decrease in specialist species of moth. In forests, logging is known to affects moth diversity, abundance, and community composition, especially in clear cuts since it resets forest succession, changes the plant communities, and affects moth communities (Summerville & Crist 2002). Prairies have also been found to support a higher diversity of moths than crop monocultures (Harrison & Berenbaum 2013), which reinforces the conclusion that plant diversity has a direct impact on moth diversity.

Porter (1908) provided a relatively extensive list of moth species found in the Decorah area, although he provided no information on the methods used, the abundance of each species, or the locations or habitats the moths were found at within the Decorah area. His paper was purely a list of butterfly and moth species present in 1908. Several names have been changed and errors have been found with Porter's (1908) identification of butterfly species (Larsen & Bovee 2001). Although no similar close analysis has been done on the moth species he identified, it is likely that name changes and errors are also present within the moth portion of Porter's (1908) list.

In the future, studies should focus on comparing the moth abundance and species richness at planted prairies and remnant prairies in the Decorah area. Although older planted prairies have been found to have similar moth species richness to remnant prairies in Central Iowa (Summerville 2008), it would be interesting to see if this is true in northeast Iowa as well, especially since plant diversity in the planted prairies at Luther College tends to be around 60-70 plant species, whereas remnant prairies often have hundreds of species (Kraszewski & Waller 2008). Remnant prairies in other parts of Iowa have been found to have a similar moth species richness and abundance of moths to older

planted prairies (Summerville et al. 2007). Determining whether older planted prairies in the Decorah area are supporting the same diversity and abundance of moths as a prairie remnant could influence management decisions when planting new prairies and maintaining current ones. Ideally, sampling of moth populations should occur over as many years as possible in order to expand the list of species found in an area, and to measure the effect of moth abundance and species richness variation from year to year (Summerville et al. 2007; Summerville 2008) to monitor changes in the moth communities over time.

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Please see Checklist in Appendix starting on next page

APPENDIX. Checklist of moth species with Hodges numbers of moths collected from black light bucket traps from planted prairies and oak-hickory forests in Luther College natural areas in Decorah, Iowa, during the summer of 2018. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	OPOSTEGIDAE - 1 SPECIES				
122	*Pseudopostega quadristrigella* (Chambers, 1875)	*	Gooseberry Barkminer	1	0
	PRODOXIDAE - 1 SPECIES				
198	*Tegeticula yuccasella* (Riley, 1872)	*	Yucca Moth	1	0
	TINEIDAE - 3 SPECIES				
340	*Acrolophus arcanella* (Clemens, 1859)		Grass Tubeworm Moth	3	2
367	*Acrolophus morus* (Grote, 1881)	*		0	2
413	*Trichophaga tapetzella* (Linnaeus, 1758)	*	Carpet Moth	0	3
	PSYCHIDAE - 1 SPECIES				
437	*Psyche casta* (Pallas, 1767)		Common Bagworm Moth	0	3
	BUCCULATRICIDAE - 1 SPECIES				
572	*Bucculatrix ainsliella* Murtfeldt, 1905		Oak Skeletonizer	0	1
	GRACILLARIIDAE - 1 SPECIES				
642	*Caloptilia umbratella* (Braun, 1927)			0	14
	DEPRESSARIIDAE - 3 SPECIES				
912	*Semioscopis packardella* (Clemens, 1863)	*	Packard's Concealer Moth	0	4
992	*Ethmia zelleriella* (Chambers, 1878)		Zeller's Ethmia Moth	0	1
1014	*Antaeotricha leucillana* (Zeller, 1854)	*	Pale Gray Bird-Dropping Moth	0	2
	OECOPHORIDAE - 1 SPECIES				
1046	*Epicallima argenticinctella* (Clemens, 1860)		Orange-headed Epicallima	0	5
	ELACHISTIDAE - 1 SPECIES				
1100	*Elachista irrorata* Braun, 1920	*		0	13
	BLASTOBASIDAE - 1 SPECIES				
1162	*Blastobasis glandulella* (Riley, 1871)		Acorn Moth	0	1
	COLEOPHORIDAE - 1 SPECIES				
1301	*Coleophora limosipennella* (Duponchel, 1843)			0	1
	MOMPHIDAE - 1 SPECIES				
1443	*Mompha eloisella* (Clemens, 1860)		Red-streaked Mompha	1	0
	COSMOPTERIGIDAE - 3 SPECIES				
1472	*Cosmopterix pulchrimella* (Chambers, 1875)		Beautiful Cosmopterix	0	2
1476	*Cosmopterix montisella* (Chambers, 1875)			0	2
1515	*Limnaecia phragmitella* Stainton, 1851		Shy Cosmet	2	9
	GELECHIIDAE - 2 SPECIES				
2281	*Dichomeris ligulella* Hübner, 1818		Palmerworm Moth	1	36
2291.1	*Dichomeris aleatrix* Hodges, 1986	*	Buffy Dichomeris Moth	1	0
	PLUTELLIDAE - 1 SPECIES				
2366	*Plutella xylostella* (Linnaeus, 1758)		Diamondback Moth	2	3

Appendix. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	YPSOLOPHIDAE - 1 SPECIES				
2375	*Ypsolopha dentella* (Fabricius, 1775)		European Honeysuckle Moth	0	5
	ARGYRESTHIIDAE - 2 SPECIES				
2441	*Argyresthia austerella* Zeller, 1873			0	4
2467	*Argyresthia oreasella* Clemens, 1860		Cherry Shoot Borer Moth	0	2
	COSSIDAE - 1 SPECIES				
2963.4	*Prionoxystus* spp.	*,**	Carpenterworm Moth	0	1
	TORTRICIDAE - 60 SPECIES				
2738	*Endothenia hebesana* (Walker, 1863)		Verbena Bud Moth	0	2
2743	*Endothenia nubilana* (Clemens, 1865)			0	1
2774	*Olethreutes monetiferanum* (Riley, 1881)			0	3
2776	*Olethreutes furfuranum* (McDunnough, 1922)		Wooly-backed Moth	2	0
2777	*Olethreutes comandranum* (Clarke, 1953)			0	6
2803	*Olethreutes merrickana* (Kearfott, 1907)			0	14
2823	*Olethreutes fasciatana* (Clemens, 1860)	*		3	6
2861	*Hedya ochroleucana* (Frölich, 1828)	*	Off-white Hedya Moth	0	3
2863	*Hedya chionosema* (Zeller, 1875)	*	White-spotted Hedya Moth	0	1
2908	*Eucosma radiatana* (Walsingham, 1879)			2	0
2927	*Eucosma ochrocephala* (Walsingham, 1895)		Pale-headed Phaneta	3	0
3033	*Pelochrista heathiana* (Kearfott, 1907)			3	0
3042	*Pelochrista vagana* (McDunnough, 1925)			2	0
3074	*Eucopina tocullionana* (Heinrich, 1920)		White Pinecone Borer Moth	1	0
3091	*Pelochrista matutina* (Grote, 1873)			8	0
3098	*Eucosma giganteana* (Riley, 1881)		Giant Eucosma Moth	8	1
3116	*Pelochrista dorsisignatana* (Clemens, 1860)		Triangle-backed Eucosma Moth	8	5
3116.1	*Pelochrista similiana* (Clemens, 1860)			3	0
3120	*Pelochrista derelicta* (Heinrich, 1929)		Derelict Eucosma Moth	26	7
3149.1	*Pelochrista gelattana* Wright, 2007*	*		2	1
3181	*Pelochrista scintillana* Clemens, 1865			1	0
3184	*Epiblema tipartitana* (Zeller, 1875)			2	0
3184.1	*Epiblema glenni* Wright, 2002			0	3
3186	*Epiblema scudderiana* (Clemens, 1860)		Goldenrod Gall Moth	0	1
3192	*Epiblema carolinana* (Walsingham, 1895)		Gray-blotched Epiblema Moth	0	8
3193	*Epiblema arizonana* Powell, 1975	*,**		0	2
3206	*Epiblema dorsisuffusana* (Kearfott, 1908)			0	1
3230	*Proteoteras aesculana* Riley, 1881		Maple Twig Borer	0	12
3263	*Gretchena bolliana* (Slingerland, 1896)		Pecan Bug Moth	0	1
3365	*Ancylis spiraeifoliana* (Clemens, 1860)	*		0	1
3492	*Cydia pomonella* (Linnaeus, 1758)		Codling Moth	1	0
3500	*Pseudogalleria inimicella* (Zeller, 1872)	*	Inimical Borer Moth	0	1
3502	*Acleris albicomana* (Clemens, 1865)		Red-edged Acleris Moth	1	1
3539	*Acleris chalybeana* (Fernald, 1882)	*	Lesser Maple Leafroller Moth	0	2
3593	*Pandemis lamprosana* (Robinson, 1869)		Woodgrain Leafroller	0	101
3594	*Pandemis limitata* (Robinson, 1869)		Three-lined Leafroller	0	40
3622	*Argyrotaenia juglandana* (Fernald, 1879)	*	Hickory Leafroller Moth	0	401
3623	*Argyrotaenia quercifoliana* (Fitch, 1858)		Yellow-winged Oak Leafroller	0	27

APPENDIX. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	TORTRICIDAE - 60 SPECIES (continued)				
3624	*Argyrotaenia alisellana* (Robinson, 1869)		White-spotted Leafroller	0	3
3630	*Diedra cockerellana* (Kearfott, 1907)		Cockerell's Moth	1	0
3632	*Choristoneura fractivittana* (Clemens, 1865)		Broken-banded Leafroller	0	17
3633	*Choristoneura parallela* (Robinson, 1869)		Parallel-banded Leafroller	1	107
3636	*Choristoneura rosaceana* (Harris, 1841)		Oblique-banded Leafroller	2	54
3648	*Archips argyrospila* (Walker, 1863)			1	5
3653	*Archips semiferanus* (Walker, 1863)		Oak Leafroller Moth	0	122
3658	*Archips purpurana* (Clemens, 1865)		Omnivorous Leafroller	0	3
3659	*Archips infumatana* (Zeller, 1875)		Smoked Leafroller Moth	0	1
3660	*Archips grisea* (Robinson, 1869)		Gray Archips Moth	1	263
3686	*Clepsis melaleucana* (Walker, 1863)		Black-patched Clepsis Moth	0	36
3688	*Clepsis peritana* (Clemens, 1860)		Garden Tortrix	1	0
3691	*Adoxophyes negundana* (McDunnough, 1923)		Shimmering Adoxophyes Moth	0	1
3695	*Sparganothis sulfureana* (Clemens, 1860)		Sparagnothis Fruitworm Moth	5	0
3720	*Cenopis reticulatana* (Clemens, 1860)		Reticulated Fruitworm Moth	0	3
3725	*Cenopis pettitana* (Robinson, 1869)		Maple-Basswood Leafroller	0	9
3727	*Cenopis niveana* (Walsingham, 1879)		Aproned Cenopis Moth	0	57
3740	*Platynota idaeusalis* (Walker, 1859)		Tufted Apple Bud Moth	0	4
3757.2	*Aethes louisiana* (Busck, 1907)			1	0
3759	*Aethes patricia* Metzler, 1999	*		2	0
3791	*Sparganothis pulcherrimana* (Walsingham, 1879)	*,**	Beautiful Sparganothis Moth	0	31
3813	*Phtheochroa birdana* (Busck, 1907)	*		1	9
	ZYGAENIDAE - 1 SPECIES				
4624	*Harrisina americana* (Guérin-Méneville, 1829)		Grapeleaf Skeletonizer	0	4
	LIMACODIDAE - 4 SPECIES				
4652	*Tortricidia testacea* Packard, 1864		Early Button Slug Moth	0	18
4665	*Lithacodes fasciola* (Herrich-Schäffer, 1854)		Yellow-shouldered Slug Moth	0	5
4667	*Apoda y-inversum* (Packard, 1864)		Yellow-collared Slug Moth	0	3
4681	*Isa textula* (Herrich-Schäffer, 1854)	*	Crowned Slug Moth	0	1
	CRAMBIDAE - 45 SPECIES				
4755	*Elophila obliteralis* (Walker, 1859)		Waterlily Leafcutter Moth	3	0
4761	*Parapoynx badiusalis* (Walker, 1859)		Chestnut-marked Pondweed	7	0
4870	*Glaphyria sesquistrialis* (Hübner, 1823)		White-roped Glaphyria Moth	1	1
4897	*Evergestis pallidata* (Hufnagel, 1767)		Purple-backed Cabbageworm	2	8
4901	*Evergestis unimacula* (Grote & Robinson, 1867)		Large-spotted Evergestis Moth	0	5
4946	*Ostrinia penitalis* (Grote, 1876)		American Lotus	0	1
4949	*Ostrinia nubilalis* (Hübner, 1796)		European Corn Borer Moth	11	8
4951	*Perispasta caeculalis* Zeller, 1875	*	Titian Peale's Pyralid Moth	0	3
4953	*Anania tertialis* (Guenée, 1854)		Crowned Phlyctaenia	2	7
4962	*Hahncappsia* spp.		(3 species combined)	2	1
4992	*Uresiphita reversalis* (Guenée, 1854)		Genista Broom Moth	0	1
5034	*Pyrausta signatalis* Walker, 1866		Raspberry Pyrausta	4	0
5036	*Pyrausta inveterascalis* Barnes & McDunnough, 1918			0	4
5042	*Pyrausta onythesalis* (Walker, 1859)	*		0	1
5049	*Pyrausta phoenicealis* (Hübner, 1818)	*	Phoenician Pyrausta	0	1

APPENDIX. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	CRAMBIDAE - 45 SPECIES (continued)				
5079	*Udea rubigalis* (Guenée, 1854)		Celery Leaftier Moth	31	26
5156	*Nomophila nearctica* Munroe, 1973		Lucerne Moth	19	2
5159	*Desmia funeralis* (Hübner, 1796)		Grape Leaffolder	0	7
5169	*Hymenia perspectalis* (Hübner, 1796)	*	Spotted Beet Webworm	1	1
5176	*Anageshna primordialis* (Dyar, 1907)		Yellow-spotted Webworm Moth	0	25
5226	*Palpita magniferalis* (Walkner, 1861)		Splendid Palpita	0	75
5228	*Polygrammodes flavidalis* (Guenée, 1854)		Ironweed Root Moth	18	0
5250	*Lygropia rivulalis* Hampson, 1898		Bog Lygropia	0	1
5274	*Herpetogramma phaeopteralis* (Guenée, 1854)	*,**	Dusky Herpetogramma Moth	0	3
5275	*Herpetogramma pertextalis* (Lederer, 1863)		Bold Feather Grass Moth	0	19
5276	*Herpetogramma abdominalis* (Zeller, 1872)			11	147
5277	*Herpetogramma thestealis* (Walker, 1859)		Zigzag Herpetogramma Moth	1	253
5280	*Herpetogramma aeglealis* (Walker, 1859)		Serpentine Webworm	0	75
5281	*Pilocrocis ramentalis* Lederer, 1863	*	Scraped pilocrocis Moth	0	1
5316	*Donacaula melinellus* (Clemens, 1860)			1	0
5340	*Crambus hamella* (Thunberg, 1794)			19	138
5357	*Crambus leachellus* (Zincken, 1818)		Leach's Grass Veneer	31	24
5361	*Crambus albellus* Clemens, 1860		Small White Grass Veneer Moth	14	112
5381	*Neodactria caliginosellus* (Clemens, 1860)		Corn Root Webworm Moth	25	3
5382	*Neodactria murellus* (Dyar, 1904)	*		6	0
5391	*Chrysoteuchia topiarius* (Zeller, 1866)		Topiary Grass-veneer	6	10
5403	*Agriphila vulgivagellus* (Clemens, 1860)		Vagabond Crambus	4	0
5413	*Pediasia trisecta* (Walker, 1856)		Sod Webworm	5	5
5416	*Pediasia abnaki* (Klots, 1942)	*		2	0
5420	*Microcrambus elegans* (Clemens, 1860)		Elegant Grass Veneer Moth	9	5
5435	*Fissicrambus mutabilis* (Clemens, 1860)		Changeable Grass Vermeer Moth	13	0
5439	*Thaumatopsis pexellus* (Zeller, 1863)		Woolly Grass-veneer Moth	1	0
5451	*Parapediasia teterrellus* (Zincken, 1821)	*	Bluegrass Webworm Moth	1	0
5464	*Urola nivalis* (Drury, 1773)		Snowy Urola	17	4
5482	*Haimbachia squamulella* (Zeller, 1881)			5	0
	PYRALIDAE - 28 SPECIES				
5510	*Pyralis farinalis* Linnaeus, 1758	*	Meal Moth	0	3
5511	*Aglossa costiferalis* (Walker, 1866)			0	1
5517	*Aglossa caprealis* (Hübner, [1809])		Stored Grain Moth	0	14
5524	*Hypsopygia costalis* (Fabricius, 1775)		Clover Hayworm	7	2
5526	*Hypsopygia intermedialis* (Walker, 1862)		Red-shawled Moth	0	1
5556	*Tosale oviplagalis* (Walker, 1866)		Dimorphic Tosale Moth	1	1
5566	*Arta statalis* (Grote, 1875)		Posturing Arta Moth	45	2
5597	*Pococera melanogrammos* (Zeller, 1872)	*	Black-letter Pococera	0	1
5608	*Pococera expandens* (Walker, 1863)	*	Striped Oak Webworm	0	2
5622	*Galleria mellonella* (Linnaeus, 1758)	*	Greater Wax Moth	0	3
5630	*Aphomia terrenella* Zeller, 1848		Terrenella Bee Moth	0	3
5659	*Acrobasis palliolella* Ragonot, 1887		Mantled Acrobasis Moth	0	1
5661	*Acrobasis juglandis* (LeBaron, 1872)		Pecan Leaf Casebearer Moth	0	2
5664	*Acrobasis caryae* Grote, 1881		Hickory Shoot Borer Moth	0	29
5669	*Acrobasis stigmella* Dyar, 1908	*		1	6
5673	*Acrobasis angusella* Grote, 1880		Hickory Leafstem Borer	0	2
5674	*Acrobasis demotella* Grote, 1881		Walnut Shoot Moth	0	32

APPENDIX. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/S	Common Name	Prairie	Woods
	PYRALIDAE - 28 SPECIES (continued)				
5745	*Glyptocera consobrinella* Zeller, 1872	*		0	1
5766	*Immyrla nigrovittella* Dyar, 1906			0	55
5767	*Oreana unicolorella* (Hulst, 1887)			0	1
5794	*Sciota vetustella* (Dyar, 1904)			0	15
5797	*Sciota virgatella* (Clemens, 1860)		Black-spotted Leafroller	0	12
5803	*Sciota celtidella* (Hulst, 1890)			0	11
5926	*Canarsia ulmiarrosorella* (Clemens, 1860)		Elm Leaftier Moth	0	1
5944	*Homoeosoma deceptorium* Heinrich, 1956			1	6
5968	*Zophodia grossulariella* (Hübner, [1809])		Gooseberry Fruitworm Moth	0	31
5995	*Euzophera semifuneralis* (Walker, 1863)		American Plum Borer	0	3
6007	*Vitula edmandsii* (Packard, 1864)		American Wax Moth	0	2
	PTEROPHORIDAE - 5 SPECIES				
6118	*Amblyptilia pica* (Walsingham, 1880)		Geranium Plume Moth	0	4
6186	*Hellinsia inquinatus* Zeller, 1873	*		0	1
6226	*Hellinsia unicolor* (Barnes & McDunnough, 1938)	*		0	1
	DREPANIDAE - 2 SPECIES				
6236	*Habrosyne gloriosa* (Guenée, 1852)		Glorious Habrosyne	2	1
6255	*Oreta rosea* (Walker, 1855)		Rose Hooktip	0	1
	GEOMETRIDAE - 57 SPECIES				
6270	*Protitame virginalis* (Hulst, 1900)	*	Virgin Moth	0	1
6273	*Macaria pustularia* (Guenée, [1858])		Lesser Maple Spanworm	1	1
6274	*Macaria libearia* (Fitch, 1848)	*	Currant Spanworm Moth	0	2
6303	*Macaria subcessaria* (Walker, 1861)		Barred Speranza	0	12
6326	*Macaria aemulataria* Walker, 1861		Common Angle	0	17
6339	*Macaria transitaria* Walker, 1861		Blurry Chocolate Angle Moth	0	1
6340	*Macaria minorata* Packard, 1873		Minor Angle Moth	0	1
6353	*Macaria multilineata* Packard, 1873	*	Many-lined Angle	0	2
6386	*Digrammia ocellinata* (Guenée, [1858])		Faint-spotted Angle	0	2
6405	*Digrammia gnophosaria* (Guenée, [1858])		Hollow-spotted Angle	1	0
6443	*Glenoides texanaria* (Hulst, 1888)	*	Texas Gray	0	1
6583	*Iridopsis ephyraria* (Walker, 1860)		Pale-winged Gray	1	21
6588	*Iridopsis larvaria* (Guenée, [1858])		Bent-line Gray	0	2
6590	*Anavitrinella pampinaria* (Guenée, [1858])		Common Gray Moth	3	138
6597	*Ectropis crepuscularia* ([Denis & Schiffermüller], 1775)		The Small Engraved Moth	0	2
6620	*Melanolophia canadaria* (Guenée, [1858])		Canadian Melanolophia	0	1
6640	*Biston betularia* (Linnaeus, 1758)		Pepper and Salt Geometer	20	4
6654	*Hypagyrtis unipunctata* (Haworth, 1809)		One-spotted Variant	1	55
6739	*Euchlaena irraria* (Barnes & McDunnough, 1917)	*	Least-marked Euchlaena	0	5
6743	*Xanthotype sospeta* (Drury, 1773)	*,**	Crocus Geometer	3	10
6748	*Pero ancetaria* (Hübner, 1806)		Hubner's Pero	2	12
6753	*Pero honestaria* (Walker, 1860)		Honest Pero	39	9
6796	*Campaea perlata* (Guenée, [1858])		Pale Beauty	0	15
6798	*Ennomos subsignaria* (Hübner, [1823])		Elm Spanworm Moth	0	20
6819	*Metanema inatomaria* (Guenée, [1858])		Pale Metanema	0	3
6827	*Metarranthis hypochraria* (Herrich-Schäffer, [1854])	*	Common Metarranthis	0	5

APPENDIX. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	GEOMETRIDAE - 57 SPECIES				
6842	*Plagodis phlogosaria* (Guenée, [1858])		Straight-lined Plagodis	0	41
6885	*Besma quercivoraria* (Guenée, [1858])		Oak Besma	0	55
6906	*Nepytia canosaria* (Walker, [1863])		False Hemlock Looper	0	2
6912	*Sicya macularia* (Harris, 1850)		Sharp-lined Yellow	0	6
6941	*Eusarca confusaria* (Hübner, [1813])		Confused Eusarca	25	8
6960	*Ogdoconta cinereola* (Guenée, 1852)		Snowy Geometer	1	6
6963	*Tetracis crocallata* Guenée, 1858		Yellow Slant-Line	0	3
6964	*Tetracis cachexiata* Guenée, [1858]		White Slant-Line	0	1
6966	*Eutrapela clemataria* (J.E. Smith, 1797)		Curve-toothed Geometer Moth	0	2
6982	*Prochoerodes lineola* (Goeze, 1781)		Large Maple Spanworm	0	32
7010	*Nematocampa resistaria* (Herrich-Schäffer, [1856])		Horned Spanworm Moth	3	263
7058	*Synchlora aerata* (Fabricius, 1798)		Wavy-lined Emerald	0	1
7071	*Chlorochlamys chloroleucaria* (Guenée, [1858])		Blackberry Looper	0	5
7132	*Pleuroprucha insulsaria* (Guenée, [1858])		Common Tan Wave	2	17
7136	*Cyclophora packardi* (Prout, 1936)		Packard's Wave	0	8
7146	*Haematopis grataria* (Fabricius, 1798)		Chickweed Geometer	3	5
7157	*Scopula cacuminaria* (Morrison, 1874)	*	Frosted Tan Wave	0	12
7162	*Scopula ancellata* (Hulst, 1887)	*	Angled Wave	0	4
7189	*Dysstroma hersiliata* (Guenée, [1858])		Orange-barred Carpet Moth	0	2
7196	*Eulithis diversilineata* (Hübner, [1813])			1	41
7290	*Coryphista meadii* (Packard, 1874)	*	Barberry Geometer	0	5
7390	*Xanthorhoe lacustrata* Guenée, 1858		Toothed Brown Carpet	2	18
7394	*Epirrhoe alternata* (Müller, 1764)		White-banded Toothed Carpet	3	185
7414	*Orthonama obstipata* (Fabricius, 1794)		The Gem	1	2
7416	*Costaconvexa centrostrigaria* (Wollaston, 1858)		Bent-line Carpet	12	23
7430	*Trichodezia albovittata* (Guenée, [1858])		White-striped Black	0	1
7440	*Eubaphe mendica* (Walker, 1854)		The Beggar	1	16
7445	*Horisme intestinata* (Guenée, [1858])		Brown Bark Carpet Moth	1	11
7474	*Eupithecia miserulata* Grote, 1863		Common Eupithecia Moth	5	67
7645	*Heterophleps refusaria* Herrich-Schäffer, [1854]		Three-patched Bigwing Moth	0	38
7647	*Heterophleps triguttaria* Herrich-Schäffer, [1854]		Three-spotted Fillip	0	14
	APATELODIDAE - 1 SPECIES				
7663	*Apatelodes torrefacta* (Smith, 1797)		Spotted Apatelodes	1	0
	LASIOCAMPIDAE - 3 SPECIES				
7670	*Tolype velleda* (Stoll, 1791)		Large Tolype	1	4
7698	*Malacosoma disstria* Hübner, 1820		Forest Tent Caterpillar Moth	0	5
7701	*Malacosoma americana* (Fabricius, 1793)		Eastern Tent Caterpillar Moth	0	9
	SATURNIIDAE - 2 SPECIES				
7757	*Antheraea polyphemus* (Cramer, 1776)		Polyphemus Moth	0	5
7758	*Actias Luna* (Linnaeus, 1758)		Luna Moth	0	5
	SPHINGIDAE - 7 SPECIES				
7776	*Manduca quinquemaculatus* (Haworth, 1803)		Five-spotted Hawk Moth	0	1
7789	*Ceratomia catalpae* (Boisduval, 1875)		Catalpa Sphinx Moth	0	2
7824	*Paonias excaecata* (Smith, 1797)		Blind-eyed Sphinx Moth	2	3
7825	*Paonias myops* (Smith, 1797)		Small-eyed Sphinx Moth	0	3

APPENDIX. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	SPHINGIDAE - 7 SPECIES Continued				
7827	*Amorpha juglandis* (Smith, 1797)		Walnut Sphinx Moth	0	8
7885	*Darapsa myron* (Cramer, 1780)		Virginia Creeper Sphinx Moth	0	1
7894	*Hyles lineata* (Fabricius, 1775)		White-lined Sphinx Moth	28	0
	NOTODONTIDAE - 14 SPECIES				
7895	*Clostera albosigma* Fitch, 1856		Sigmoid Prominent Moth	0	1
7915	*Nadata gibbosa* (Smith, 1797)		White-dotted Prominent Moth	2	72
7917	*Hyperaeschra georgica* (Herrich-Schäffer, 1855)	*	Georgian Prominent Moth	0	1
7922	*Pheosia rimosa* Packard, 1864		Black-rimmed Prominent Moth	3	7
7929	*Nerice bidentata* Walker, 1855		Double-toothed Prominent	0	2
7930	*Ellida caniplaga* (Walker, 1856)		Linden Prominent Moth	3	22
7931	*Gluphisia septentrionis* Walker, 1855		Common Gluphisia	5	4
7940	*Furcula scolopendrina* (Boisduval, 1869)	*	Zigzag Furcula Moth	0	1
7990	*Heterocampa umbrata* Walker, 1855	*	White-blotched Heterocampa	1	16
7994	*Heterocampa guttivitta* (Walker, 1855)		Saddled Prominent Moth	6	83
7995	*Heterocampa biundata* Walker, 1855		Wavy-lined Heterocampa Moth	1	6
7999	*Lochmaeus bilineata* (Packard, 1864)		Double-lined Prominent	0	61
8005	*Schizura ipomaeae* Doubleday, 1841		Morning Glory Prominent Moth	2	7
8011	*Schizura leptinoides* Grote, 1864		Black-blotched Schizura Moth	3	61
	EREBIDAE - 75 SPECIES				
8045.1	*Crambidia pallida* (Packard, 1864)		Pale Lichen Moth	145	5
8090	*Hypoprepia fucosa* Hübner, [1831]		Painted Lichen Moth	1	248
8098	*Clemensia albata* Packard, 1864		Little White Lichen Moth	0	52
8109	*Haploa reversa* (Stretch, 1885)		Reversed Haploa Moth	21	16
8111	*Haploa lecontei* (Guérin-Méneville, 1832)		Leconte's Haploa Moth	0	84
8112	*Haploa confusa* (Lyman, 1887)		Confused Haploa	24	0
8114	*Virbia laeta* (Guérin-Méneville, 1844)	*	Joyful Virbia	0	3
8122	*Virbia rubicundaria* (Hübner, 1827)			0	1
8123	*Virbia ferruginosa* (Walker, 1854)		Rusty Holomelina	1	2
8124	*Virbia immaculata* (Reakirt, 1864)		Immaculate Virbia	16	0
8129	*Pyrrharctia isabella* (Smith, 1797)		Isabella Tiger Moth	46	13
8134	*Spilosoma congrua* Walker, 1855		Agreeable Tiger Moth	2	25
8137	*Spilosoma virginica* (Fabricius, 1798)		Virginia Tiger Moth	37	11
8158	*Phragmatobia assimilans* Walker, 1855		Large Ruby Tiger Moth	84	0
8169	*Apantesis phalerata* (Harris, 1841)	*	Harnessed Tiger Moth	50	2
8175	*Apantesis virguncula* (Kirby, 1837)		Little Virgin Tiger Moth	10	0
8197	*Apantesis virgo* (Linnaeus, 1758)		Virgin Tiger Moth	3	0
8203	*Halysidota tessellaris* (Smith, 1797)		Banded Tussock Moth	4	59
8238	*Euchaetes egle* (Drury, 1773)		Milkweed Tussock Moth	1	5
8262	*Ctenucha virginica* (Esper, 1794)		Virginia Ctenucha Moth	1	1
8267	*Cisseps fulvicollis* Grote, 1865		Yellow-collared Scape Moth	2	0
8314	*Orgyia definita* (Packard, 1864)	*	Definite Tussock Moth	1	9
8316	*Orgyia leucostigma* (Smith, 1797)		White-Marked Tussock Moth	0	2
8322	*Idia americalis* (Guenée, 1854)		American Idia	0	57
8323	*Idia aemula* Huebner, 1814		Common Idia	0	107
8334	*Idia lubricalis* (Geyer, 1832)		Glossy Black Idia Moth	0	2
8334.1	*Idia occidentalis* (Smith, 1884)	*		0	1
8338	*Phalaenophana pyramusalis* (Walker, 1859)		Dark-banded Owlet	5	25

Appendix. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	EREBIDAE - 75 SPECIES Continued				
8345	*Zanclognatha laevigata* (Grote, 1872)		Variable Zanclognatha Moth	1	8
8347	*Zanclognatha obscuripennis* (Grote, 1872)		Dark Zanclognatha	0	10
8351	*Zanclognatha cruralis* (Guenée, 1854)		Early Zanclognatha Moth	0	60
8352	*Zanclognatha marcidilinea* (Grote, 1872)		Yellowish Zanclognatha Moth	0	1
8353	*Zanclognatha jacchusalis* (Waleker, 1859)		Wavy-lined Zanclognatha Moth	0	8
8355	*Chytolita morbidalis* (Guenée, 1854)		Morbid Owlet	1	18
8357	*Macrochilo absorptalis* (Walker, 1859)		Slant-lined Owlet Moth	8	0
8360	*Macrochilo orciferalis* (Walker, 1859)		Bronzy Macrochilo Moth	23	0
8362	*Phalaenostola metonalis* (Walker, 1859)		Pale Epidelta Moth	1	0
8363	*Phalaenostola eumelusalis* (Walker, 1859)		Dark Phalaenostola	0	3
8364	*Phalaenostola larentioides* Grote, 1873		Black-banded Owlet Moth	18	0
8370	*Bleptina caradrinalis* Guenée, 1854	*	Bent-winged Owlet Moth	2	1
8379	*Renia factiosalis* (Walker, 1859)	*	Sociable Renia Moth	0	2
8381	*Renia discoloralis* Guenée, 1854	*	Discolored Renia Moth	0	4
8387	*Renia sobrialis* (Walker, 1859)		Sober Renia Moth	0	5
8393	*Lascoria ambigualis* Walker, 1866		Ambiguous Moth	17	5
8397	*Palthis angulalis* (Hübner, 1796)		Dark-spotted Palthis	0	9
8404	*Rivula propinqualis* Guenée, 1854		Spotted Grass Moth	3	9
8428	*Dyspyralis nigellus* (Strecker, 1900)	*		0	5
8447	*Hypena madefactalis* Guenée, 1854		Gray-edged Bomolocha Moth	0	10
8448	*Hypena sordidula* Grote, 1872		Sordid Bomolocha Moth	0	2
8450	*Hypena atomaria* (Smith, 1903)			0	1
8452	*Hypena edictalis* Walker, 1859		Large Hypena Moth	0	1
8455	*Hypena eductalis* Walker, [1859]	*	Red-footed Hypena	0	14
8461	*Hypena humuli* Harris, 1841		Hop Vine Moth	0	6
8465	*Hypena scabra* (Frabricius, 1798)		Green Cloverworm Moth	6	9
8493	*Isogona tenuis* (Grote, 1872)		Thin-lined Owlet Moth	0	5
8500	*Metalectra quadrisignata* (Walker, [1858])		Four-spotted Fungus Moth	0	2
8534	*Plusiodonta compressipalpis* Guenée, 1852	*	Moonseed Moth	1	0
8692	*Zale galbanata* (Morrison, 1876)		Maple Zale Moth	0	7
8704	*Zale helata* (Smith, 1908)		Brown-spotted Zale Moth	0	2
8716	*Zale unilineata* (Grote, 1876)		One-Lined Zale	0	3
8739	*Caenurgina erechtea* (Cramer, [1780])		Forage Looper	15	1
8771	*Catocala piatrix* Grote, 1864		The Penitent	0	1
8778	*Catocala habilis* Grote, 1872	*	Habilis Underwing	0	2
8779	*Catocala serena* Edwards, 1864		Serene Underwing	0	3
8780	*Catocala robinsonii* Grote, 1872	*	Robinson's Underwing	0	2
8781	*Catocala judith* Strecker, 1874	*	Judith's Underwing Moth	0	2
8791	*Catocala insolabilis* Guenée, 1852		Inconsolable Underwing Moth	0	3
8795	*Catocala palaeogama* Guenée, 1852		Oldwife Underwing Moth	0	1
8798	*Catocala neogama* (Smith, 1797)		The Bride	0	1
8801	*Catocala ilia* (Cramer, [1775])		Ilia Underwing	0	1
8851	*Catocala coccinata* Grote, 1872		Scarlet Underwing	0	1
8857	*Catocala ultronia* (Hübner, 1823)		Ultronia Underwing Moth	0	2
8864	*Catocala grynea* (Cramer, 1779)		Woody Underwing Moth	0	2
8876	*Catocala micronympha* Guenée, 1852	*	Little Nymph	0	3
9037	*Hyperstrotia pervertens* (Barnes & McDunnough, 1918)	*	Dotted Graylet Moth	0	2

APPENDIX. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	NOLIDAE - 4 SPECIES				
8971	*Baileya dormitans* (Guenée, 1852)		Sleeping Baileya Moth	0	39
8972	*Baileya levitans* (Smith, 1906)	*	Pale Baileya	0	2
8983.2	*Meganola spodia* Franclemont, 1985		Ashy Meganola Moth	1	12
8992	*Nola triquetrana* (Fitch, 1856)		Three-spotted Nola Moth	0	1
	NOCTUIDAE - 138 SPECIES				
8880	*Abrostola ovalis* Guenée, 1852	*	Oval Abrostola	0	9
8881	*Abrostola urentis* Guenée, 1852		Spectacled Nettle Moth	5	38
8887	*Trichoplusia ni* (Hübner, [1803])		Cabbage Looper Moth	4	0
8890	*Chysodeixis includens* (Walker, [1858])		Soybean Looper	0	1
8897	*Diachrysia balluca* Geyer, 1832		Hologram Moth	0	1
8898	*Allagrapha aerea* (Hübner, [1803])		Unspotted Looper	2	3
8908	*Autographa precationis* (Guenée, 1852)		Common Looper	5	3
8924	*Anagrapha falcifera* (Kirby, 1837)		Celery Looper	8	2
9047	*Protodeltote muscosula* (Guenée, 1852)		Large Mossy Lithacodia	11	34
9049	*Maliattha synochitis* (Grote & Robinson, 1868)		Black-dotted Maliattha	12	113
9051	*Lithacodia musta* (Grote & Robinson, 1868)		Small Mossy Lithacodia	0	2
9053	*Pseudeustrotia carneola* (Guenée, 1852)		Pink-barred Pseudeustrotia	1	389
9057	*Homophoberia apicosa* (Haworth, 1809)		Black Wedge-Spot	0	1
9062	*Cerma cerintha* (Treitschke, 1826)		Tufted Bird-dropping Moth	0	5
9065	*Leuconycta diphteroides* (Guenée, 1852)		Green Leuconycta Moth	2	53
9066	*Leuconycta lepidula* (Grote, 1874)		Marbled-green Leuconycta	0	128
9089	*Ponometia binocula* (Grote, 1875)	*	Prairie Bird-dropping Moth	2	0
9095	*Ponometia erastrioides* (Guenée, 1852)		Small Bird Dropping Moth	2	5
9189	*Charadra deridens* Morrison, 1875	*	The Laugher	1	0
9193	*Raphia frater* Grote, 1864		The Brother Moth	0	1
9200	*Acronicta americana* Harris, 1841		American Dagger Moth	0	2
9227	*Acronicta laetifica* Smith, 1897		Pleasant Dagger Moth	0	1
9229	*Acronicta hasta* Guenée, 1852		Speared Dagger Moth	0	2
9235	*Acronicta spinigera* (Guenée, 1852)		Nondescript Dagger Moth	1	8
9237	*Acronicta interrupta* Guenée, 1852		Interrupted Dagger Moth	0	3
9238	*Acronicta lobeliae* (Guenée, 1852)		Lobelia Dagger Moth	0	2
9242	*Acronicta exilis* Grote, 1874		Exiled Dagger Moth	0	34
9243	*Acronicta ovata* (Grote, 1873)		Ovate Dagger Moth	0	15
9244	*Acronicta modica* Walker, 1856	*	Medium Dagger Moth	0	4
9245	*Acronicta haesitata* (Grote, 1882)		Hesitant Dagger Moth	0	6
9246	*Acronicta clarescens* (Guenée, 1852)	*	Clear Dagger Moth	0	18
9247	*Acronicta tristis* Smith, 1911			0	32
9248	*Acronicta hamamelis* (Guenée, 1852)		Witch Hazel Dagger Moth	0	6
9249	*Acronicta increta* (Morrison, 1874)		Raspberry Bud Dagger Moth	0	7
9251	*Acronicta retardata* (Walker, 1861)		Retarded Dagger Moth	0	7
9280	*Acronicta insularis* (Herrich-Schäffer, 1868)		Henry's Marsh Moth	30	0
9284	*Anterastria teratophora* (Herrich-Schäffer, [1854])		Gray Marvel	12	137
9286	*Harrisimemna trisignata* (Walker, 1856)		Harris's Three Spot	0	1
9329	*Apamea cariosa* (Guenée, 1852)	*	Nondescript Dagger Moth	0	1
9329.1	*Apamea quinteri* Mikkola & Lafontaine, 2009	*		0	5
9364	*Apamea sordens* (Hufnagel, 1766)		Bordered Apamea	1	3
9373	*Apamea helva* (Grote, 1875)		Yellow Three-spot	1	2
9378	*Apamea burgessi* (Morrison, 1874)	*		0	1
9385.1	*Lateroligia ophiogramma* (Esper, 1793)		Double Lobed Apamea	8	1
9391	*Resapamea passer* (Guenée, 1852)	*	Dock Rustic	9	0

Appendix. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	NOCTUIDAE - 138 SPECIES (continued)				
9406	*Mesapamea fractilinea* Grote, 1874		Broken-lined Brocade	2	15
9408	*Neoligia exhausta* (Smith, 1903)		Exhausted Brocade Moth	0	6
9409	*Papaipema unimoda* (Smith, 1894)		Meadow Rue Borer Moth	0	1
9427	*Meropleon diversicolor* (Morrison, 1874)		Multicolored Sedgeminer	0	12
9428	*Meropleon ambifusca* (Newman, 1948)		Newman's Brocade Moth	1	1
9433	*Xylomoia chagnoni* Barnes & McDunnough, 1917	*		5	1
9454	*Loscopia velata* (Walker, 1865)		Veiled Ear Moth	5	0
9456	*Amphipoea interoceanica* (Smith, 1899)	*	Interoceanic Ear Moth	6	0
9466	*Papaipema cataphracta* (Grote, 1864)		Burdock Borer Moth	0	2
9471	*Papaipema arctivorens* Hampson, 1910		Northern Burdock Borer Moth	2	1
9478	*Papaipema leucostigma* (Harris, 1841)		Columbine Borer Moth	0	1
9484	*Papaipema rutila* (Guenée, 1852)	*	Mayapple Borer Moth	0	1
9488	*Papaipema marginidens* (Bird, 1902)		Brick-red Borer Moth	0	3
9496	*Papaipema nebris* (Guenée, 1852)		Stalk Borer Moth	21	7
9500	*Papaipema maritima* Bird, 1909		Maritime Sunflower Borer	3	0
9503	*Papaipema rigida* (Grote, 1877)		Rigid Sunflower Borer Moth	2	1
9509	*Papaipema unimoda* (Smith, 1894)		Meadow Rue Borer Moth	0	2
9513	*Hydraecia immanis* Guenée, 1852		Hop Vine Borer Moth	5	0
9514	*Hydraecia micacea* (Esper, 1789)	*	Rosy Rustic Moth	1	0
9545	*Euplexia benesimilis* McDunnough, 1922		American Angle Shades	2	27
9555	*Ipimorpha pleonectusa* (Grote, 1873)	*	Even-lined Sallow	0	1
9556	*Chytonix palliatricula* (Guenée, 1852)	*	Cloaked Marvel	0	21
9578	*Hyppa xylinoides* (Guenée, 1852)	*	Common Hyppa	4	5
9618	*Phosphila turbulenta* Hübner, 1818		Turbulent Phosphila	0	1
9619	*Phosphila miselioides* (Guenée, 1852)	*	Spotted Phosphila	0	7
9631	*Callopistria mollissima* (Guenée, 1852)		Pink-shaded Fern Moth	0	9
9638	*Amphipyra pyramidoides* Guenée, 1852		Copper Underwing	1	18
9647	*Proxenus miranda* (Grote, 1873)		Miranda Moth	20	0
9661	*Crambodes talidiformis* Guenée, 1852		Verbena Moth	1	0
9665	*Spodoptera exigua* (Hübner, [1808])		Beet Armyworm Moth	1	0
9666	*Spodoptera frugiperda* (Smith, 1797)		Fall Armyworm Moth	0	1
9669	*Spodoptera ornithogalli* (Guenée, 1852)		Yellow-striped Armyworm Moth	39	0
9679	*Elaphria chalcedonia* (Hübner, [1808])		Chalcedony Midget Moth	0	30
9684	*Elaphria grata* Hübner, 1818		Grateful Midget Moth	1	2
9688	*Galgula partita* Guenée, 1852		The Wedgeling	32	9
9690	*Condica videns* (Guenée, 1852)		White-dotted Groundling Moth	10	1
9693	*Condica mobilis* (Walker, [1857])	*,**	Mobile Groundling Moth	0	18
9696	*Condica vecors* (Guenée, 1852)		Dusky Groundling Moth	0	3
9720	*Ogdoconta cinereola* (Guenée, 1852)		Common Pinkband	6	12
9754	*Plagiomimicus pityochromus* Grote, 1873		Black-barred Brown	18	1
9887	*Lithophane bethunei* (Grote & Robinson, 1868)		Bethune's Pinion	0	1
9889	*Lithophane petulca* Grote, 1874		Wanton Pinion Moth	0	1
9932	*Pyreferra pettiti* (Grote, 1874)			0	1
9933	*Eupsilia vinulenta* (Grote, 1864)		Straight-toothed Sallow	0	1
9957	*Sunira bicolorago* (Guenée, 1852)		Bicolored Sallow	0	2
9987	*Mniotype ducta* (Grote, 1878)	*,**		9	0
10200	*Cucullia asteroides* Guenée, 1852		The Asteroid	1	0
10223	*Anarta trifolli* (Hufnagel, 1766)		Nutmeg Moth	5	0
10289	*Orthodes goodelli* (Grote, 1875)		Goodell's Arches Moth	1	0

APPENDIX. Continued. Checklist of moth species. County records indicated by *, state records indicated by **.

Hodges #		CR*/SR**	Common Name	Prairie	Woods
	NOCTUIDAE - 138 SPECIES (continued)				
10292	*Melanchra adjuncta* (Guenée, 1852)		Hitched Arches	5	41
10293	*Melanchra picta* (Harris, 1841)	*	Zebra Caterpillar Moth	1	0
10301	*Spiramater lutra* (Guenée, 1852)	*	Otter Spiramater	0	2
10304	*Trichordestra legitima* (Grote, 1864)	*	Striped Garden Caterpillar Moth	2	0
10397	*Lacinipolia renigera* (Stephens, 1829)		Bristly Cutworm	113	219
10405	*Lacinipolia lorea* (Guenée, 1852)		Bridled Arches	1	7
10431	*Dargida diffusa* (Walker, 1856)		Wheat Head Armyworm	2	0
10434	*Dargida rubripennis* (Grote & Robinson, 1870)	*	The Pink-streak	8	0
10438	*Mythimna unipuncta* (Haworth, 1809)		Armyworm Moth	46	13
10444	*Leucania phragmitidicola* Guenée, 1852		Phragmites Wainscot	5	0
10445	*Leucania linda* Franclemont, 1952		Linda Wainscot Moth	1	0
10446	*Leucania multilinea* Walker, 1856		Many-Lined Wainscot	5	20
10447	*Leucania commoides* Guenée, 1852			17	1
10455	*Leucania scirpicola* (Guenée, 1852)	*	Scirpus Wainscot	2	0
10524	*Nephelodes minians* Guenée, 1852		Bronzed Cutworm	18	10
10552	*Protorthodes incincta* (Morrison, 1874)	*	Banded Quaker Moth	0	1
10578	*Pseudorthodes vecors* (Guenée, 1852)		Small Brown Quaker Moth	3	138
10585	*Orthodes majuscula* Herrich-Schäffer, 1868		Rustic Quaker Moth	16	42
10587	*Orthodes cynica* Guenée, 1852		Cynical Quaker	14	121
10627	*Tricholita signata* (Walker, 1860)		Dingy Cutworm	2	1
10648	*Agrotis gladiaria* Morrison, 1874		Swordsman Dart	0	1
10651	*Agrotis venerabilis* Walker, [1857]		Venerable Dart	4	5
10663	*Agrotis ipsilon* (Hufnagel, 1766)		Ipsilion Dart	7	3
10675	*Feltia tricosa* (Lintner, 1874)	*	Confused Dart Moth	56	0
10676	*Feltia herilis* (Grote, 1873)		Master's Dart Moth	49	11
10803	*Euxoa velleripennis* (Grote, 1874)	*	Fleece-winged Dart	3	0
10878	*Striacosta albicosta* (Smith, 1888)	*	Western Bean Cutworm Moth	1	1
10891	*Ochropleura implecta* Lafontaine, 1998		Flame-shouldered Dart Moth	2	8
10915	*Peridroma saucia* (Hübner, [1808])		Variegated Cutworm Moth	9	4
10942.1	*Xestia dolosa* Franclemont, 1980		Greater Black-letter Dart	45	138
10943	*Xestia normanianus* (Grote, 1874)		Norman's Dart	1	2
10944	*Xestia smithii* (Snellen, 1896)		Smith's Dart Moth	2	47
10955	*Agnorisma badinodis* (Grote, 1874)		Pale-banded Dart	0	1
11003.1	*Noctua pronuba* (Linnaeus, 1758)		Large Yellow Underwing	2	4
11006	*Protolampra brunneicollis* (Grote, 1865)		Brown-collared Dart Moth	28	14
11029	*Abagrotis alternata* (Grote, 1864)		Greater Red Dart	0	1
11041	*Abagrotis placida* (Grote, 1876)	*		0	4
11045	*Abagrotis anchocelioides* (Guenée, 1852)		Blueberry Budworm Moth	0	1
11063	*Pyrrhia cilisca* (Lafontaine & Mikkola, 1996)		Bordered Sallow	1	1
11068	*Helicoverpa zea* (Boddie, 1850)		Corn Earworm Moth	16	2
11128	*Schinia arcigera* (Guenée, 1852)		Arcigera Flower Moth	1	0
11135	*Schinia rivulosa* (Guenée, 1852)		Ragweed Flower Moth	1	0
11141	*Schinia thoreaui* Grote & Robinson, 1870	*	Thoreau's Flower Moth	1	0
11149	*Schinia trifascia* Hübner, 1818	*	Three-lined Flower Moth	1	0
			Identified Moths	**1985**	**7575**
			Species Richness	**221**	**393**