A survey of the leafhoppers, planthoppers, froghoppers, grasshoppers, butterflies and moths of the Green River State Wildlife Area, Lee County, Illinois.

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1.0 INTRODUCTION

Roughly one-fifth of the insects found on Midwestern prairie and savanna remnants are restricted to these habitat islands by narrow habitat requirements. Sites as large as the Green River State Wildlife Area (GRSWA) have been found to harbor scores of these 'remnant dependent' (r-d) or 'conservative' species in this region (see table 1). We conducted a search for conservative insect species* at GRSWA in 1990-91 and again in 2002. John and Cynthia McKee conducted thorough butterfly monitoring studies in 2000-2002. Kurt Laurent conducted general insect surveys in 1997 and 1998. The results of these studies are combined in a region-wide analysis presented below.

2.0 METHODS (2002)

The following taxa, all of which include appreciable numbers of r-d species, were the primary focus of the 2002 survey:
(1) **Leafhoppers, planthoppers and froghoppers** (Homoptera, in part) [1990-91 & 2002]
(2) **Butterflies** (Lepidoptera) [1990-91 & 2002]
(3) **Moths** (Lepidoptera) [2002]
(4) **Grasshoppers and walking sticks** (Orthoptera) [2002]

Additional taxa surveyed included dragonflies and a modest number of beetles.

Five diurnal surveys were conducted by one or two investigators between April 15 and October 10. Aerial nets, sweep nets and vacuum collectors were employed to capture adult specimens during each visit.

Eight nocturnal moth surveys were conducted between April 15 and October 10. Generator-powered sodium vapor and black lights suspended in front of upright bedroom sheets were used to attract moths on 6 occasions between May 1 and October 1. In addition, five or more funnel-type light traps powered by 12 volt batteries were operated from 8 pm to 8 am on eight nights for a total of 50 trap nights.

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* Many ecologically-tolerant prairie species occur more frequently and in greater numbers within remnants than they do in degraded systems. These "remnant-associated" species were targeted as well.

Butterflies, dragonflies, and other easily identified insects were captured, identified, and released. Difficult species were sacrificed and retained for further examination; these are currently housed as voucher specimens at Northeastern Illinois University and in the collection of the senior author (most will be donated to the Field Museum within the next 5 years).

Specimens were identified using a variety of taxonomic manuals, keys, and field guides, some of which are listed in the attached bibliography. In the case of the moths, specimens were compared with reference specimens from the collections of the Field Museum of Natural History, Chicago, IL, and the Illinois Natural History Survey, Champaign, IL. Difficult specimens were taken to the University of Ohio for identification in early December. A. K. Hamilton (Research Branch, Agricultural Canada) assisted in the identification of leafhoppers.

3.0 RESULTS

We recorded one hundred and twenty-six species representing 2 orders and 11 families in 1990-1991. Kurt Laurent added another 185 species in 1997-98. John and Cynthia McKee added yet another 5 butterfly species in 2000-02. We recorded 325 species in 2002, adding 289 new species to the site total. In summary, **601 species representing 63 families in 9 orders** have been identified at GRSWA to date (Appendix 1).

Whereas the bulk of the species we recorded in 1990-91 were determined to be wide-ranging species with broad ecological amplitudes, 41 were determined to be uncommon remnant-dependent species. Laurent and the McKees recorded an additional 3 conservatives within the past six years. We managed to add another 62 r-d species last year, bringing the total to 106 (Table 2).

4.0 DISCUSSION (see Appendix 2)

GRSWA supports an impressive number of conservative insects, many of which are either uncommon or rare in both Illinois and neighboring Indiana (See Appendix 1). Decades of field trials, food plot plowing and invasion by exotics (e.g., *Phalaris arundinacea*) has resulted in the degradation of much of the prairie on this site. Nevertheless, GRSWA, by virtue of its large size and rich upland habitats, harbors more remnant-restricted insect species than do a substantial majority of the higher quality (but smaller) reserves in this region (e.g., Tables 1 and 3)* .

4.1 Butterflies (species abundance)

Roughly one third of the butterflies known to occur in Illinois (60) have been recorded at GRSWA since 1989. Fourteen conservative species have been recorded on this site within the past 13 years (all but *L. eurydice, Lycaena helloides, Euphyes dion,* and *C. gorgone* were observed in 2002).

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* A thorough moth survey cannot be completed in one year. An additional year of work will be required to match the exhaustive data presented in Table 1. If our results from year one are any indication, it is not unlikely that GRSWA will be found to match or exceed most or all of sites listed in terms of conservative species richness.

The purplish copper, the two-spotted skipper, the aphrodite, and the byssus skipper are known to occur on less than 20 protected sites in Illinois and should be considered to be very uncommon elements (S2). Several others, including, the Dion skipper, the silver bordered fritillary and the great copper are uncommon (S3) and tend to be restricted to larger remnants in this region. Species such as the crossline skipper, the black dash, the southern cloudy wing, the bronze copper, and the baltimore checkerspot are somewhat common but will likely become much less so as shrinking habitat islands become more isolated and local extinctions accelerate.

The gorgone checkerspot, *Chlosyne gorgone carlotta*, is a rare prairie species in northern Illinois but may be more common to the west and south. One regal fritillary was observed by the MacKees in 2002. This species is rare throughout its range and should be considered to be a rare element (S1). However, since this species has been seen only once in 10 years, we did not include it in out tally of resident conservative species.

4.2 Moths

Forty-eight conservative moth species have been recorded thus far. Chief among these were several members of the genus *Papaipema* . . .

4.2.1 Papaipema. The North American genus *Papaipema* is comprised of approximately 55 species (Quinter 1983), with roughly 40 occurring in the East and/or Midwest (Hessel 1954). Most are restricted to native plant communities by narrow host plant requirements. As a consequence, most are uncommon or rare in large portions of their range.

The Chicago region has long been considered the center of distribution for many of the members of this group. Twenty-seven species were recorded in and around Chicago between the years of 1915 and 1942 by A. K. Wyatt, E. Beer, and others (Wyatt 1915-1942). We have managed to "rediscover" 25 of these species, and have recorded 2 additional species within Illinois natural areas within the past 10 years.

The *Papaipema* moths of northeastern Illinois and northwestern Indiana can be categorized according to habitat requirements as follows: 19 prairie/fen species; 5 savanna/woodland species; and 5 wide-ranging, unrestricted species. A site as large as GRWSA should probably support 10 to 13 of the prairie species (the host plants of 14 prairie species occur on this site.).

Eleven remnant-restricted *Papaipema* species were recorded, establishing GRSWA as one of the richer prairie *Papaipema* sanctuaries in the northern Midwest (Illinois, Wisconsin, Michigan and Indiana (e.g., Table 3). The savanna species *Papaipema cerina* is currently known from less than 10 protected sites and should be considered to be a rare element (S1S2) in Illinois. The Maritime root borer, *P. maritima*, has only been recorded on 4 sites in Michigan (J. Bess, Pers. comm.) and seems to be nearly as rare in Illinois. The Liatris root borer, *P. beeriana*, also known from 4 sites in Michigan (J. Bess, Pers. comm.), is listed as endangered in Ohio, and is uncommon in Illinois and Indiana.

The Culver's root stem borer, *P. sciata* and the golden alexander root borer are equally as uncommon in Illinois and Indiana. These species should be treated as uncommon elements (S2S3).

The *Silphium* root borer, *P. silphii*, is listed in Michigan (T), Wisconsin (T), and Ohio (E), but is fortunately a somewhat common member of our upland prairie fauna in Illinois and Indiana. The sneeze weed borer, *P. impecuniosa*, and the sensitive fern borer, *P. inquisita*, are still relatively common, and can usually be found where their host plants occur (S3).

4.2.2 Additional moths. Many very uncommon or rare upland moth species (besides Papaipema's) were recorded at GRSWA. *Apamea plutonia* and *Oncocnemis viriditincta* are not known to inhabit any protected sites in Illinois, and are likely state records (S1). The *Amorpha*-feeding *Catocala whitneyi*, the sunflower feeder *Plagiomimicus spumosum* and the moths *Paecetes abrostolella* and *Apamea lutosa* are known from eight or fewer sites in Illinois (S1-S2). The false boneset moth, *Loxagrotis grotei*, and the wetland species *Chortodes defecta* are known from only two other preserves in Illinois and should be considered to be rare elements (S1).

The Leadplant flower moth, *Schinia lucens*, is known from only one site in Michigan where it is listed as endangered. This *Amorpha*-feeder is apparently scarce in Illinois and should be treated as a very uncommon element (S2).

Capis curvata and *Tarachidia binocula* are clearly uncommon members of our wet prairie fauna in Illinois and Indiana (S2S3). *Platyperigea meralis, Eucoptocnemis fimbriaris, Euxoa niveilinea and Trichosilia manifesta* are very uncommon savanna species in both Illinois and Indiana. *Schinia saturata*, previously known only from west central Illinois, seems to be absent from most of northern Illinois.

Eucosma n.s. Brown, known only from the Gensburg Markham and Green River Prairies in Illinois and from the Haydon Prairie in Iowa, ranks with *P. eryngii* and *Papaipema* n.s. #10 in terms of both local and global rarity (G1, S1).

4.3 Leafhoppers, planthoppers, froghoppers

One hundred and two homopteran species have been recorded to date (Appendix 1). Whereas 61 are clearly common, wide-ranging species, 39 are considered to be uncommon, r-d species (Table 2).

Seven of the leafhopper species we recorded are very scarce in this region and should be considered to be of conservation concern. *Paraphlepsius maculosus* is known from less than 10 sites in North America. *Polyamia similaris* has been recorded on only one other site in Illinois. These species should be considered to be rare elements (G1G2S1). *Polyamia rossi*, *Destria fumidus* and *Flexamia atlantica* are known from fewer than 10 sites in the northern Midwest (Illinois, Wisconsin and Indiana) and

should be considered to be rare elements as well (S1). Focusing strictly on Illinois and Indiana, *Destria fumidus* (7 sites), *Flexamia pyrops* (4 sites) *Xerophloea peltata* (5 sites) and *Paraphlepsius solidaginis* (5 sites) are known from fewer than eight sites and should be considered to be very uncommon to rare (S1-S2).

The boreal species *Pendarus magnus* and *Cribrus shingwauki*, while generally uncommon throughout much of their ranges, are relatively secure within the Chicago Wilderness region (S3). The great plaines species *Paraphlepsius lobatus* and *Scaphytopius cinereus* are likewise common in Illinois (S2).

The prairie-dependent leafhopper fauna of GRSWA compares favorably with those recorded on most of the high quality prairie remnants in this region (Table 1).

4.4 Other r-d insects

Kurt Laurent recorded a variety of grasshoppers, katydids, beetles, true bugs, wasps, beetles and flies, nearly all of which are common, wide-ranging generalist species. Among the species we recorded, The toothpick grasshopper, *Mermiria bivitatta*, the spur throat *Hesperotettix viridis*, slant face *Eritettix simplex* and the prairie katydid *Conocephalus saltans* are uncommon sand prairie species in this region (S2S3). The prairie-associated beetle *Pachybrachis spumarius* has been recorded on only five other prairies within the Chicago Wilderness region and should be considered to be an uncommon element (S2) as well. Blatchley's walking stick, *Diapheromera blatchleyi*, was recorded within mesic and wet prairie habitats throughout the site. This is a somewhat common mesic and wet prairie species in this region (S3S4).

4.5 Distribution among habitats. GRSWA was found to support an impressive mix of xeric, mesic and wet prairie/ savanna species. Species characteristic of wetter, sedge meadow and marsh habitats, however, were least plentiful. Only 18% of the conservative species recorded are considered to be denizens of sedge meadow/marsh habitats (we sampled these areas rather heavily in 2002). Decades of field trials, food plot plowing and invasion by exotics (e.g., *Phalaris arundinacea*) have apparently taken their toll on these habitats. In sharp contrast, over 50% of the species recorded inhabit mesic and/or wet prairie habitats. GRSWA clearly ranks among the best (most intact) examples of xeric/mesic/wet prairie insect assemblages occurring east of the Mississippi River.

4.6 Spatial distribution

We found the insect species of conservation concern (both r-d and r-a species) to be distributed somewhat evenly between the high quality tract east of parking lot # 6 and the scattered remnant patches (taken in total) west of Pump Factory Road (PFR). As expected, the area east of PFR was found to support a subset of species that are scarce or absent from the remainder of the complex. Unexpectedly, an equal number of species were recorded solely (exclusively) in one or more areas west of PFR. Our results underscore the importance of protecting all of the remnant plant communities indicated in figure 1.

4.7 Survey Thoroughness

After three years of relatively intensive survey work, most (90-100%) of the butterflies, froghoppers and macro leafhoppers that occur on this site have likely been recorded. We estimate that 80% of the resident grasshoppers and katydids are known. In contrast, experience suggests that our one-year survey of the moths is far from complete (a minimum of two years are required to do a thorough job). Given the extent of the fluctuations in density that insect populations tend to undergo, the very localized populations of many species within what appear to be homogeneous habitats, the propensity of many species to flee well in advance of investigators, and the large size of the GRSWA site, further efforts can be expected to unearth scores of additional macro and micro moth species.

Recommendations

The prairie complex east of parking lot #6 ranks among the best sand prairie sites in Illinois (or Indiana) in terms of plant community quality and insect species richness and should be considered for nomination as an Illinois Nature Preserve.

The extensive swath of wetlands situated in the western sections of this site have been reduced to isolated remnant patches by invasive species (*Phalaris, Typha*). Despite their relatively small size and increasing isolation, these areas support rare elements (e.g., *Chortodes defecta*, *Capis curvata*, *Pseudeva purpurigera*, *Lycaena helloides* and *Eucosma* n.s. Brown). The protection and expansion of these biologically rich habitats should be considered a high priority management objective.

Despite their small size and somewhat degraded condition, the xeric areas situated in areas 3 and 5 (see Figure 1) continue to support a host of species known to be scarce within the eastern extension of the tallgrass prairie biome (Illinois, Indiana and Ohio). Excellent examples include *Schinia lucens, Catocala whitnei, Loxigrotus grotei, platyperigera meralis, Apamea plutonia*, and *Oncocnemis viriditincta*, all of which should be listed as Endangered or Threatened in Illinois. As in the case of the beleaguered wetlands, an effort should be made to protect and expand these biologically rich habitats.

5.0 Bibliography

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Table 1. Distribution of insect species richness among 13 prairie reserves within the Chicago Wilderness region (2003)

Sites	moths		butterflies		Homoptera		Other	TOTAL
soil types	totals	r-d	totals	r-d	totals	r-d	r-d	r-d's
SAND								
Iroquois (800 ha)[1]	613	76	46	16	180	48	5	145
Illinois Beach State Park[1]	425	86	51	16	123	51	7	160
Chiwaukee (90 ha.)	380	71	39	10	82	41	2	124
GMP (70 ha.)	416	68	50	14	133	48	6	136
Dupont (50 ha.)[1]	331	38	37	13	101	38	2	91
C&P (50 ha.)[1]	303	44	47	15	78	31	3	93
Green River Prairie [1]	**311**	**48**	**60**	**14**	**81**	**39**	**5**	**106 [2]**
DOLOMITE								
DesPlaines Cons Area	305	35	23	5	58	22	4	66
Lockport	242	35	32	8	70	30	5	77
Romeoville	221	28	30	7	62	23	5	58
SILT LOAM								
Goose Lake Prairie	400	60	46	15	85	42	3	120
Grant Creek (30 ha.)	329	51	37	9	72	26	4	90
Chicago Ridge (3 ha.)	120	17	22	2	53	20	2	41

[1] These sites include sand savanna habitats.

[2] This inventory has not been completed.

Table 2. Conservation status, host plant requirements, and habitat associations of the conservative and remnant-associated insects known to inhabit the Green River State Wildlife Area. (Panzer, Derkovitz & Gnaedingerr, 2003)

Taxon	Habitat associations			Host plants	Status northern IL [6]	Capture locations [5]
	xeric	mesic/wet	sedge meadow			
ODONATA: Anisoptera (dragonflies)						
Libullulidae						
Sympetrum semicinctum			r-a	N/A		4 6
ORTHOPTERA: grasshoppers, et al.						
Acrididae						
Hesperotettix viridis pratensis	r-d			oligophagous	C3	1 5
Melanoplinae						
Eritettix simplex	r-d			*Bouteloua , Stipa, etc.*	C5	1 3 5
Mermeria bivitatta	r-d			native grasses	C3	3 5
Trachyrachis kiowa fuscifrons	r-a			grasses		
Acridinae						
Arphia zanthoptera	r-a					1 3 4 5 6
Tettigoniidae						
Conocephalus saltans	r-d				C3	1 5
Phasmatidae						
Heteronemiinae						
Diapheromera blatchleyi blatcheyi		r-d			C1	1 7
LEPIDOPTERA: butterflies						
Hesperidae						
Atrytone delaware	r-a			*Andropogon*		
Erynnis baptisiae		r-d		*Baptisia*		
Euphyes bimacula		r-d	r-d	*Carex*	C3	1
Euphyes conspicua			r-d	*Carex*	C1	1 4 7
Euphyes dion			r-d	*Carex*	C2	1
Polites origines	r-d	r-d		native grasses	C2	1 2 6
Problema byssus	r-d	r-d		*Andropogon*	C3	1 2
Thorybes bathyllus	r-d			*legumes*	C3	1 5
Lycaenidae						
Harkenclenus titus	r-a	r-a		*Prunus*		1 5 6
Lycaena helloides		r-d	r-d	*Polygonum*	C4	1 6
Lycaena thoe		r-d	r-d	*Polygonum*	C2	1 7
Nymphalidae						
Boloria selene myrina		r-d		*Viola* spp.	C3	1 2 7
Boloria belona		r-d		*Viola* spp.	C3	
Chlosyne gorgone carlotta	r-d			*Helianthus laetiflorus*	C5	1 3

Taxon	Habitat associations			Host plants	Status northern IL [6]	Capture locations [5]
	xeric	mesic/wet	sedge meadow			
Euphydryas phaeton		r-d	r-d	*Chelone*	C2	1
Speyeria aphrodite		r-d		*Viola* spp.	C3	1 2
Speyeria cybele		r-a		*Viola* spp.		
Speyeria idalia [3]				*Viola* spp.	C5	
Papilionidae						
Papilio cresphontes [2]		r-a				
Battus philenor [3]		r-a		*Arisolochia*		
Satyridae						
Cercyonis pegala olympus		r-a				1 2 3 4 5 6 7
Lethe eurydice		r-d	r-d	*Carex*	C2	1 7
LEPIDOPTERA: moths						
Cosmopterigidae						
Cosmopteriginae						
Triclonella determinatella		r-d		legumes, *Desmodium,* etc.	C5	1 2 5
Tortricidae						
Olethreutinae						
Eucosma n.s.		r-d		*Spartina (?)*	C5	1 7
Eucosma giganteana		r-d		*Silphium*	C1	1
Eucosma bilineana		r-a		*Helianthus*		1 4 6 7
Eucosma palabundana		r-d			C4	1
Epiblema tripartitana		r-a		*Rudbeckia*		
Pyralidae						
(Crambiformes) Odontiinae						
Nascia acutella		r-d	r-d		C2	4 6 7
Polygrammodes flavidalis		r-d	r-d	*Vernonia* root-borer	C3	1 7
(Pyraliformes) Phycitinae						
Nephopterix basilaris		r-a	r-a	*Salix*		1 4 7
Geometridae						
Ennominae						
Petrophora subaequaria		r-a		ferns		
Notodontidae						
Pheosia rimosa		r-a	r-a	poplars, willows		4 5
Arctiidae						
Arctiinae						
Pygarctia spraguei	r-d			*Euphorbia corolata*	C4	1 2 3 5
Grammia (Apantesis) virguncula		r-d			C2	1 7
Noctuidae						
Hypeninae						

Taxon	Habitat associations			Host plants	Status northern IL [6]	Capture locations [5]
	xeric	mesic/wet	sedge meadow			
Phytometra ernestiana	r-d	r-d		unknown	C4	1 5
Phytometra rhodarialis	r-a	r-a		unknown		
Catocalinae						
Lesmone detrahens	r-d	r-d		unknown	C3	1 2 3
Catocala habilis [2]	r-a			*Amorpha, Robinia*		
Catocala whitneyi	r-d			*Amorpha*	C5	3
Eutellinae						
Paecetes abrostolella [2]	r-d				C5	1
Plusiinae						
Pseudeva purpurigera		r-d		*Thalictrum*	C4	1 4
Acontiinae						
Capis curvata		r-d	r-d		C4	1 6 7
Lithacodia albidula			r-a	grasses		1 4 6 7
Lithacodia musta		r-a		Unrecorded		
Tarachidia binocula	r-d	r-d		unknown	C3	1 2
Acronictinae						
Agriopodes teratophora			r-d	mint + *monarda*	C3	1 4
Amphipyrinae						
Apamea burgessi	r-d	r-d			C3	1 5 7
Apamea lutosa		r-d			C5	1 7
Apamea plutonia	r-d				C5	5
Chortodes defecta		r-d	r-d		C5	6 7
Cirrhophanus triangulifer		r-d	r-d	*Bidens*		1 2 4 5
Crambodes talidiformis		r-d		*Verbena* spp		1 2 3 4 5 6 7
Luperina stipata		r-d		*Spartina*	C2	1 4
Meropleon ambifusca		r-d		unknown	C2	1 2 4 5
Meropleon diversicolor			r-d	sedges	C3	1 2
Nedra ramosula		r-a		possibly *Hypericum*		4 6 7
Oligia modica			r-a	grasses, sedges		
Papaipema baptisiae		r-a		*Apocynum*		1 3 4 5
Papaipema beeriana		r-d		*Liatris*	C2	1 2
Papaipema birdi		r-d	r-d	*Cicuta maculata*	C3	1
Papaipema cerina		r-d		*Hystrix patula*	C5	1
Papaipema impecuniosa		r-d	r-d	*Helenium, aster*	C2	1 7
Papaipema inquaesita		r-d	r-d	*Onoclea*	C3	1 6
Papaipema maritima		r-d		*Cacalia, Helianthus*	C3	1 2 5
Papaipema nepheleptena		r-d	r-d	*Chelone glabra*	C3	1
Papaipema rigida		r-d		*Zizia*	C4	1 2
Papaipema sciata		r-d		*Veronicastrum*	C3	1 2

Taxon	Habitat associations			Host plants	Status northern IL [6]	Capture locations [5]
	xeric	mesic/wet	sedge meadow			
Papaipema silphii	r-d			*Silphium*	C1	1
Papaipema unimoda	r-d			*Thalictrum*	C2	1 4 7
Plagiomimicus spumosum		r-d			C5	5
Platyperigea meralis	r-d				C4	3 5
Spartiniphaga inops		r-d		*Spartina*	C3	1 4 6 7
Trachea delicata		r-a				1 2 4 5 6
Cuculliinae						
Oncocnemis viriditincta	r-d			*Penstemon*	C5	1 5
Hadeninae						
Faronta rubripennis		r-d		*P. virgatum*	C2	1 2 3
Lacanobia (Polia) legitima		r-a		*A. umbellatus, Salix,*		4 6
Leucania multilinea [2]		r-a				
Leucania phragmatidicola			r-a	grasses		1 2 4 6 7
Protorthodes incincta	r-d				C4	3
Ulolonche modesta	r-d				C4	1
Noctuinae						
Agrotis venerabilis		r-a				4 7
Agrotis vetusta	r-a			unknown		1 5
Eucoptocnemis fimbriaris	r-d				C4	1 3
Euxoa detersa	r-a					1 3 5
Euxoa messoria		r-a				
Euxoa niveilinea	r-d				C4	1 3 5
Euxoa velleripennis		r-a		unknown		1 4 6 7
Loxagrotis grotei		r-d		*Khunia*	C5	1 5
Trichosilia manifesta	r-d				C4	1 5
Heliothinae						
Pyrrhia umbra	r-a					1 5
Schinia arcigera		r-a		*Aster*		1 2
Schinia lucens	r-d	r-d		*Amorpha,* SL	C5	3
Schinia saturata	r-d			golden aster	C5	1 3 5
HOMOPTERA: leafhoppers, planthoppers, treehoppers, and frohgoppers						
Cicadellidae						
Athysaninae						
Amplicephalus osborni		r-d	r-d		C2	1 4 6 7
Chlorotettix fallax		r-d		native grasses	C2	1 3 5
Chlorotettix spatulatus	r-d	r-d		*Andropogon scoparius*	C1	1 5
Cicadula cyperacea		r-d	r-d	sedges	C4	4 6 7
Cicadula saliens (melanogaster)		r-d	r-d	sedges	C1	1 4 6 7
Cicadula straminea		r-d	r-d	sedges	C4	1 4 6 7

Taxon	Habitat associations			Host plants	Status northern IL [6]	Capture locations [5]
	xeric	mesic/wet	sedge meadow			
Cribrus shingwauki		r-d		*Calamagrostis*	C2	1 4 6
Destria fumidus		r-d			C4	1 4
Driotura gammaroides	r-a					
Flexamia areolata	r-d			*Eragrostis spectabilis*	C4	1 5
Flexamia atlantica		r-d			C5	3
Flexamia prairiana	r-d	r-d		*Sorgastrum nutans*	C3	1 2
Flexamia delongi	r-d	r-d			C2	1 2 3 5
Flexamia pyrops	r-d			*Aristida*	C5	1
Flexamia reflexa		r-d		*Andropogon*	C3	1 2 4
Graminella aureovittata		r-d		*Panicum virgatum*	C2	1 2 4 6
Graminella mohri		r-d		*Panicum virgatum*	C3	1 3
Graminella pallidula		r-d			C3	1
Graminella oquaka		r-d		*Panicum virgatum*	C4	1 2
Laevicephalus unicoloratus	r-d	r-d		*Andropogon*	C1	1 2
Mesamia nigridorsum		r-d		*Helianthus*	C1	1 4 6 7
Ophiola osborni	r-a	r-a				
Palus bilineatus		r-d	r-d	Carex	C4	1 4 6 7
Palus delector		r-d	r-d	Carex	C5	6
Palus luteocephalus		r-d	r-d	Carex	C3	1
Paraphlepsius fulvidorsum	r-d	r-d			C3	1
Paraphlepsius altus		r-d			C5	2
Paraphlepsius lobatus		r-d		*Andropogon scoparius*	C2	1 3
Paraphlepsius luxuria		r-d	r-d		C3	1 4 7
Paraphlepsius solidaginis		r-d		*Solidago*	C5	1
Paraphlepsius maculosus	r-d				C5	1 5
Pendarus (Remadosus) magnus		r-d		*Spartina pectinata*	C3	1 4
Polyamia apicata	r-a					1 3 5
Polyamia compacta	r-d				C3	1 3 5
Polyamia (Deltocephalus) caperata	r-d	r-d		*Andropogon*	C1	1 2 3 5
Polyamia rossi	r-d			*Panicum*	C5	1 2
Polyamia similaris	r-d				C5	1 3 5
Rosenus cruciatus	r-d				C5	1 5
Sanctanus cruciatus	r-a	r-a				
Scaphytopius rubellus		r-d			C3	1
Scaphytopius cinereus	r-d	r-d		*Amorpha* ?	C3	3
Scaphytopius frontalis		r-a				1 2 3 4 5 6 7
Stirellus bicolor		r-a				1 2
Ledrinae						
Xerophloea major			r-d		C3	1

Taxon	Habitat associations			Host plants	Status northern IL [6]	Capture locations [5]
	xeric	mesic/wet	sedge meadow			
Xerophloea peltata	r-d				C4	1 3 4
Dorydiinae						
Hecalus viridis	r-a					
Hecalus major		r-d		*Calamagrostis*	C1	1 4
Issidae (Caliscelidae)						
Bruchomorpha dorsata	r-d	r-d		*Andropogon*	C3	1 2 3 5
Bruchomorpha occulata	r-d			*Sorgastrm nutans*	C4	5
COLEOPTERA						
Cicindelidae						
Cryptocephalinae						
Pachybrachis spumarius group	r-d				C3	1 5

[2] Species reported by Kurt Laurent (2002). [3] Species reported by John and Cynthia McKee. [5] See Figure 1

[6] Restoration sites must ultimately be assessed in terms of their contributions to the protection of imperiled species. To facilitate this assessment, each species has been assigned a 'conservation value' reflective of its local, and, in some cases, regional rarity. Briefly, species assigned conservation values of 1 are known to inhabit 20 or more sites within the Chicago region and are presumed to be secure. At the other extreme, species with conservation values of 5 are known to inhabit four or fewer sites and are considered to be potentially imperiled. Species considered to be globally rare (e.g., Papaipema eryngii) are included in this category, irrespective of their local abundance.(≤ 5 occurences=C5; 6-10 = C4; 11-15 = C3; 16-20 = C2; >20 = C1).

Table. 3 Distribution of *Papaipema* species diversity on seventeen prairie/wetland remnants in the Chicago region [1]

Site	IROQ	GLP	IBSP	GRSWA	LHF	CHIW	GMP	DCA	GCP	SP	BP	LRS	DP	CRP	OFP	VMNT	GMTH
Site size (Acres)[2]	1600	1500	1200	300?	200	200	150	100	80	60	40	18	12	8	2	1	1
Species																	
aerata																	
new species # 10		1							1								
eryngii		1					1	1	1								
cerussata	1	1			1				1								
cerina			1	**1**		1											
eupatorii	1		1		1	1						1					
harrisi					1												
nelita			1									1					
necopina	1				1						1						
rigida			1	**1**		1	1	1	1	1							
speciosissima	1		1				1										
nepheleptena	1	1		**1**	1	1		1			1						
lysimachiae			1			1											
leucostigma			1														
maritima		1		**1**	1	1	1	1	1			1	1				
inquaesita	1	1	1	**1**		1											
limpida	1	?					1		1	1			1		1		
pterisii	1																
beeriana	1	1		**1**		1	1	1	1	1	1	1					
sciata	1	1	1	**1**	1	1	1	1	1		1						1
birdi	1	1		**1**	1		1		1	1		1					
unimoda	1		1	**1**	1	1	1	1	1	1	1	1					
impecuniosa	1	1		**1**	1	1	1	1	1	1	1	1					
silphii		1	1	**1**	1	1	1		1	1	1	1	1	1	1	1	1
Totals	**13**	**11**	**11**	**11**	**11**	**12**	**11**	**8**	**12**	**7**	**7**	**8**	**3**	**1**	**2**	**1**	**2**

BP = Bieseker Prairie (IN)
CHIW = Chiwaukee Prairie (WS)
CRP = Chicago Ridge Prairie
DCA = Desplaines Conservation Area
DP = Dropseed Prairie
GCP = Grant Creek Prairie
GLP = Goose Lake Prairie
GMP = Gensburg Markham Prairie
GMTH = German Methodist Prairie (IN)
IBSP = Illinois Beach State Park
IROQ = Iroquois County State Wildlife Area
LHF = Lake in the Hills Fen
LRS = Long Run Seep
OFP = Oak Forest Prairie
SP = Sundrop Prairie
VMNT = Vermont Cemetery Prairie
GRSWA = Green River State Wildlife Area

[1] Five "weedy" species (P. baptisiae, *P. arctivorens, P. cataphracta* , *P. furcata* , and *P. nebris*) are not included in this comparison.

[2] Acreage does not include heavily wooded or old field habitats.

Appendix 1. A listing of the butterflies, moths, leafhoppers, froghoppers planthoppers, grasshoppers, dragonflies and assorted beetles known to inhabit the Green River State Wildlife Area in Green County, Illinois. 2002

Taxon	Authors	Host plants
ODONATA: Anisoptera (dragonflies)		
Aeshnidae: the darners		
Anax junius	Drury	N/A
Aeshna umbrosa	Walker	N/A
Aeshna constricta	Say	N/A
Cotyphaeschna ingens[2]		N/A
Libullulidae		
Celithemis eponina	Drury	N/A
Erythemis simplicicolis	Say	N/A
Leucorrhinia intacta	Hagen	N/A
Pantala flavescens	(F.)	N/A
Libellula pulchella	Drury	N/A
Libellula luctuosa	Burmeister	N/A
Sympetrum rubicundulum	Say	N/A
Sympetrum semicinctum	Say	N/A
Sympetrum vicinum	Hagen	N/A
Sympetrum obtrusum		N/A
Tramea onusta	(Drury)	N/A
Perithemis tenera	Say	N/A
Plathemis lydia	(Drury)	N/A
Pachydiplax longipennis	(Burmeister)	N/A
Gomphidae		
Styluris amnicola[2]		N/A
Dromogomphus spoliatus	Hagen	N/A
ORTHOPTERA: grasshoppers, et al.		
Acrididae		
Hesperotettix viridis pratensis	Scudder	oligophagous
Melanoplinae		
Melanoplus angustipennis	(Dodge)	
Melanoplus bivitattus	(Say)	oligophagous
Melanoplus confusus	Scudder	prefers forbes
Melanoplus differentialis	(Thomas)	prefers grasses
Melanoplus femurrubrum	(DeGeer)	grasses,sedges, forbes
Melanoplus ponderosus[2]	(Thomas)	
Melanoplus viridipes	Scudder	
Campylacantha olivacea[2]		
Schistocerca alutacea	(Harris)	forbes
Agenotettix deorum	(Scudder)	grasses and sedges
Dichromorpha viridis	(Scudder)	
Eritettix simplex	(Scudder)	grasses inc. *Bouteloua* , *Stipa*
Mermeria bivitatta	(Serville)	native grasses
Dissosteira carolina	(Linnaeus)	grasses and forbes
Encoptolophus sordidus	(Burmeister)	
Psinidia fenestralis	(Serville)	
Spharagemon bolli	Scudder	

Taxon	Authors	Host plants
Spharagemon collare	(Scudder)	grasses
Trachyrachis kiowa fuscifrons	(Stahl)	grasses
Acridinae		
Arphia zanthoptera	(Burmeister)	
Tettigoniidae		
Amblycorypha oblongifolia	(DeGeer)	
Scudderia furcata furcata	Brunner	
Scudderia curvicauda	(DeGeer)	
Neoconocephalus robustus	(Scudder)	
Neoconocephalus ensiger	(Harris)	
Neoconocephalus retusus	(Scudder)	
Conocephalus saltans		
Conocephalus strictus	(Scudder)	
Orchelimum vulgare	Harris	
Pterophylla camellifolia[2]	(Fabricius)	
Gryllidae		
Gryllus pennsylvanicus[2]		
Nemobius fasciatus[2]		
Phasmidae		
Heteronemiinae		
Diapheromera blatchleyi blatcheyi	(Caudell)	
DERMAPTERA		
Forficula auricularia		
LEPIDOPTERA: butterflies		
Danaidae		
Danaus plexippus	(Linnaeus)	*Asclepias*
Hesperidae		
Ancyloxypha numitor	(Fabricius)	
Atalopedes campestris	(Boisduval)	
Atrytone delaware	(Edwards)	*Andropogon*
Epargyreus clarus	(Cramer)	
Erynnis baptisiae	(Forbes)	*Baptisia*
Erynnnis horatius[3]		
Euphyes bimacula	(Grote & Robinson)	*Carex*
Euphyes conspicua	(Edwards)	*Carex*
Euphyes dion	(Edwards)	*Carex*
Hylephila phyleus	(Drury)	
Pholisora catullus	(Fabricius)	
Poanes hobomok	(Harris)	
Polites coras	(Cramer)	
Polites themistocles		grasses
Polites origines	(Fabricius)	native grasses
Problema byssus	(Edwards)	*Andropogon*
Thorybes bathyllus	(J.E. Smith)	*legumes*
Wallengrenia egeremet	(Scudder)	
Pieridae:		
Pieris protodice	Boisduval and LaConte	
Pieris rapae	Linnaeus	

Taxon	Authors	Host plants
Colias eurytheme	Boisduval	
Colias philodice	Godart	
Eurema lisa	(Boisduval & LeConte)	*Cassia*
Nathalis iole[3]	Boisduval	
Lycaenidae		
Callophrys gryneus[3]		
Celastrina argiolus pseudargiolus	(Boisduval & LeConte)	
Everes comyntas	(Godart)	
Harkenclenus titus	(Fabricius)	*Prunus*
Lycaena helloides	(Boisduval)	*Polygonum*
Lycaena phlaeas americana	Harris	*Rumex acetocella*
Lycaena thoe	(Guerin-Meneville)	*Polygonum*
Strymon melinus		
Nymphalidae		
Agillas milberti[2]		
Boloria selene myrina	(Cramer)	*Viola* spp.
Boloria belona	(Fabricius)	*Viola* spp.
Chlosyne gorgone carlotta	(Rekirt)	*Helianthus laetiflorus*
Cynthia virginiensis	(Drury)	*Antennaria*
Euphydryas phaeton		*Chelone*
Euptoieta claudia	(Cramer)	
Limenitis archippus	(Cramer)	*Salix*
Limenitis arthemis astyanax	(Fabricius)	
Libytheana carinenta	(Kirtland)	*Celtis*
Nymphalis antiopa	(Linnaeus)	*Salix*
Phyciodes tharos	(Drury)	*Aster*
Polygonia interragationis	(Fabricius)	
Precis coenia	(Hubner)	
Speyeria aphrodite	(Fabricius)	*Viola* spp.
Speyeria cybele	(Fabricius)	*Viola* spp.
Speyeria idalia[3]	(Drury)	*Viola* spp.
Vanessa atalanta	(Fruhstorfer)	
Vanessa cardui		
Papilionidae		
Papilio cresphontes[2]		
Papilio polyxlenes	Stoll	*Umbelliferae*
Papilio glaucus	Linnaeus	
Papilio marcellus[2]		
Battus philenor[3]	(Linnaeus)	
Papilo troilus	Linnaeus	
Satyridae		
Cercyonis pegala olympus	(Edwards)	
Lethe eurydice	(Johansson)	*Carex*
LEPIDOPTERA: moths		
Oecophoridae		
Depressariinae		
Depressaria pastinacella	(Duponchel)	*Pastinaca*
Cosmopterigidae		

Taxon	Authors	Host plants
Cosmopteriginae		
Triclonella determinatella	(Zeller)	legumes, *Desmodium,* etc.
Limnaecia phragmitella	Stainton	*Typha* flowerheads
Gelechiidae		
Gelechiinae		
Chionodes pseudofondella	(Busck)	*Pycnanthemum?, Eupatorium?*
Dichomeridinae		
Dichomeris ochripalpella	(Zeller)	*Aster, Solidago*
Sesiidae		
Pennisetia marginata [2]	(Harris)	
Tortricidae		
Olethreutinae		
Bactra maiorina	Heinrich	*Scirpus*
Phaneta olivaceana	(Riley)	*Solidago*
Eucosma n.s.	(R.L. Brown)	*Spartina (?)*
Eucosma giganteana	Riley	*Silphium*
Eucosma bilineana	Kearfott	*Helianthus*
Eucosma dorsisignatana	(Clemens)	
Eucosma ridingsana	(Robinson)	
Ecdytolopha punctadiscana	(Dyar)	
Eucosma palabundana	Heinrich	
Epiblema tripartitana	(Zeller)	*Rudbeckia*
Epiblema boxcana	(Kearfott)	
Pseudosciagraphilia duplex	(Walsingham)	*Populus, Betula, Salix*
Ancylis burgessiana	(Zellar)	*Shrubs*
Tortricinae		
Choristoneura rosaceana [2]		
Argyrotaenia velutinana	(Walker)	
Ptychloma peritana	(Clemens)	*Fragaria*
Sparganothis xanthoides	(Walker)	
Limacodidae		
Lithacodes fasciola	(H.-S.)	willows oaks elms etc
Euclea delphinii	(Bdv.)	
Pyralidae		
(Crambiformes) Nymphulinae		
Synclita obliteralis	(Walker)	Aquatic plants
(Crambiformes) Odontiinae		
Microtheoris ophionalis lacustris	Hodges	
Nascia acutella	(Walker)	
Ostrinia nubilalis	(Hubner)	
Achyra rantalas	(Guenee)	
Lineodes integra	(Zeller)	
Loxostege sticticalis	(Linnaeus)	
Pyrausta (Cindaphia) bicoloralis	(Guenee)	
Pyrausta rubricalis	(Hubner)	
Udea rubigalis	(Guenee)	
Nomophila nearctica	Mun.	
Desmia maculalis	Westwood	
Polygrammodes flavidalis	(Guenee)	*Vernonia* root-borer

Taxon	Authors	Host plants
Pantographa limata	(G. & R.)	Basswoods, Oaks
Phylaectania coronata	(Hufnagel)	*Sambucus,* many others
(Crambiformes) Crambinae		
Chrysoteuchia topiaria	(Zell.)	
Agriphila vulgivagella	(Clemens)	
Pediasia trisecta	(Walker)	
(Pyraliformes) Pyralinae		
Hypsopygia costalis	*(F.)*	
(Pyraliformes) Chrysauginae		
Condylolomia participalis	Grote	
(Pyraliformes) Phycitinae		
Nephopterix basilaris	Zeller	*Salix*
Geometridae		
Ennominae		
Anacampsis humnaria	(Guenee)	
Anavitrinella pampinaria	(Guenee)	
Antepione thisoria	(Guenee)	
Besma quercivoriara [2]		
Biston betularia	(Linnaeus)	
Campaea perlata [2]	(Guenee)	
Ectropis crepuscularia [2]	(D.& S.)	
Ennomos magnaria	Guenee	trees
Erannis tilliaria [2]	(Harr.)	
Euchlaena johnsonaria	(Fitch)	
Euchlaena serrata	(Drury)	apple & maple
Euchlaena obtusaria [2]		
Eumacaria latiferrugata	(Wlk)	cherry, plum
Eusarca confusaria	Hbn.	Composites
Eutrapela clemataria	(J. E. Smith)	
Exelis pyrolaria	Guenee	
Heliomata cycladata	Grote & Rob.	
Hypagyrtis unipunctata [2]	(Haworth)	
Itame ribearia	Fitch	*Ribes*
Mellilla xanthometata	(Walker)	
Metanema inatomaria	Guenee	
Nematocampa limbata	(Haworth)	trees
Pero honestaria	(Wlk)	
Petrophora subaequaria	(Walker)	Ferns
Tetracis crocallata	Guenee	
Xanthotype urticaria	Swett	
Geometrinae		
Synchlora aerata [2]	(Fabricius)	Composites
Sterrhinae		
Haematopis grataria	(Fabricius)	chickweed, clover
Calothysanis amaturaria	(Walker)	*Polygonum*
Lobocleta plemaria	(Guenee)	
Scopula limboundata	(Haworth)	
Larentiinae		

Taxon	Authors	Host plants
Anticlea multiferrata	(Walker)	
Coryphista meadii [2]	(Packard)	
Eulithis diversilineata	(Hubner)	*Vitis*
Hydriomena renunciata [2]		
Orthonama obstipata	F.	
Orthonama centrostrigaria	(Wollaston)	*Polygonum* spp
Eubaphe mendica	(Walker)	
Euphyia unangulata [2]	(Haworth)	
Xanthorhoe ferrugata	(Clerck)	
Apatelodidae		
Apatelodes torrefacta	(J. E. Smith)	
Lasiocampidae		
Lasiocampinae		
Malacosoma americanum	(Fabricious)	trees & shrubs esp. rose family
Saturniidae		
Citheroniinae		
Eacles imperalis	(Drury)	
Dryocampa rubicunda	(Fabricius)	
Hemileucinae		
Automeris io	(F.)	many woody & herbaceous plants
Saturniinae		
Arctias luna		
Callosamia promethia [2]		
Sphingidae		
Sphinginae		
Manduca sexta [2]	(Linnaeus)	pest of potato, tobacco & tomato
Ceratomia hageni	Grote	Osage orange
Ceratomia undulosa	(Walker)	Hawthorn, Oak, Ash
Ceratomia amyntor	(Walker)	
Sphinx kalmiae	(J.E. Smith)	
Sphinx gordius	Cramer	huckleberry, apple, etc.
Smerinthus jamaicensis	(Drury)	
Pachysphinx modesta	(Harr.)	Salix, Populus
Paonias excaecatus	(J.E. Smith)	
Paonias myops	(J.E. Smith)	hawthorns, poplars, willows ++
Macroglossinae		
Darapsa myron	(Cramer)	Virginia creeper
Deidamia iunscripta	(Harr.)	
Sphecodina abbottii	(Swainson)	*Ampelopsis,* grapes
Hyles lineata	(F.)	
Notodontidae		
Clostera albostigmata	Fitch	
Datana ministra	(Drury)	
Datana perspicua	(Grote & Robinson)	
Datana contracta [2]		
Peridea angulosa [2]	(J.E. Smith)	
Pheosia rimosa	Packard	poplars ,willows
Nadata gibbosa [2]	(J. E. Smith)	

Taxon	Authors	Host plants
Gluphisia septentrionis	Walker	
Hyperaeschra georgica[2]		
Dasylophia anguina	(J.E. Smith)	*Desmodium, Baptisia, etc.*
Heterocampa leucostigma [2]		
Heterocampa obliqua	(Packard)	
Arctiidae		
Lithosiinae		
Hypoprepia miniata	(Kirby)	
Hypoprepia fucosa	Hubner	
Arctiinae		
Haploa reversa	(Brown)	*Eupatorium,* oaks, willows ++
Haploa lecontei	(Guer. - Meneville)	
Holomelina sp.		
Isia (Pyrrharctia) isabella	(J.E. Smith)	
Estigmene acrea	(Dru.)	many herbs
Spilosoma virginica	(Fabricious)	
Hyphantria cunea	(Drury)	trees
Phragmatobia fulginosa	(Linnaeus)	
Phragmatobia lineata	Neuman & Donahue	*Eupatorium*
Pygarctia spraguei	(Grote)	*Euphorbia corolata*
Apantesis phalerata[2]	(Harr.)	many herbs
Grammia (Apantesis) oithona		
Grammia (Apantesis) virguncula	Kirby	
Grammia (Apantesis) virgo	(Linnaeus)	
Grammia (Apantesis) arge	(Drury)	
Halysidota caryae[2]		
Halysidota tessellaris	(J.E. Smith)	
Cycnia tenera	Hubner	Indian hemp & milkweeds
Euchaetes egle	(Drury)	
Ctenuchinae		
Cisseps (Scepsis) fulvicollis	(Hubner)	
Noctuidae		
Herminiinae		
Idia americalis	(Guenee)	
Idia lubricans	(Geyer)	
Idia aemula	Hubner	
Phalaenophana pyramusalis	(Walker)	
Macrochilo absorbtalis	(Walker)	
Macrochilo (Hormisa) orciferalis	(Walker)	
Phalaenostola metonalis	(Walker)	bluegrass duff OH
Phalaenostola larentioides	Grote	
Tetanolita floridana	(Smith)	
Bleptina caradrinalis	Guenee	
Renia flavipunctalis	(Geyer)	
Palthis angulalis	(Hubner)	
Rivuliinae		
Lascoria ambigualis	Wlk.	
Rivula propinqualis	Guenee	
Zanclognatha ochreipennis	(Grote)	

Taxon	Authors	Host plants
Zanclognatha pedipilalis	(Guenee)	
Hypeninae		
Bomolocha baltimorealis[2]		
Bomolocha madefactalis	(Guenee)	Walnut
Plathypena scabra	(Fabricius)	leguminosae
Spargaloma sexpunctata	Grote	
Phytometra ernestiana	(Blanchard	unknown
Phytometra rhodarialis	(Walker)	unknown
Catocalinae		
Lesmone detrahens	(Walker)	unknown
Zale lunata	(Drury)	many trees & shrubs
Zale minerea	(Guenee)	trees inc. maples & poplars
Zale unilineata	(Grote)	
Caenurgia chloropha	(Hubner)	
Caenurgina crassicula	(Haworth)	
Caenurgina erechtea	(Cramer)	alfalfa, clover, grasses, ragweed
Calyptra canadensis	(Bethune)	*Thalictrum*
Cissusa spadix	(Cramer)	
Euparthenos nubilis	(Hubner)	
Mocis texana	(Morrison)	grasses
Catocala palaeogama[2]	Guenee	poplars & willows
Catocala concumbens,	Walker	poplars & willows
Catocala amatrix	(Hubner)	poplars & willows
Catocala cara	Guenee	
Catocala habilis[2]	Walker	*Amorpha, Robinia*
Catocala piatrix	Grote	walnut, pecans
Catocala ultronia	(Hubner)	Roseacea such as apple & cherry
Catocala whitneyi	Dodge	*Amorpha*
Panapoda carneicosta[2]	Guenee	
Eutellinae		
Paecetes abrostolella[2]	(Walker)	
Plusiinae		
Abrostola urentis	Guenee	stinging nettles
Trichoplusia ni[2]	(Hubner)	
Plusia balluca[2]	(Geyer)	*Rubus* spp
Allagrapha aerea	(Hubner)	stinging nettle, aster, soybean
Pseudeva purpurigera	(Walker)	*Thalictrum*
Autographa precationis	(Guenee)	
Autographa biloba	(Steph.)	
Anagrapha falcifera	(Kirby)	herbaceous plants & crops
Plusia contexta	Grote	
Acontiinae		
Capis curvata	Grote	
Thioptera nigrofimbria	(Guenee)	crabgrass , morning glories
Lithacodia muscosula	(Guenee)	Grasses
Lithacodia albidula	(Guenee)	grasses
Lithacodia (Maliattha) synochitis		*Polygonum* spp.
Lithacodia musta	(G&R)	Unrecorded

Taxon	Authors	Host plants
Lithacodia carneola	(Guenee)	*Dock, Solidago, Poygonum*
Homophoberia apicosa	(Haworth)	*Polygonum* spp
Cerma cerintha	(Treitschke)	apple, plum, peach, cherry
Leuconycta diphteroides	(Guenee)	goldenrods
Tarachidia binocula	(Grote,1875)	unknown
Tarachidia candefacta	(Hubner)	*Ambrosia*
Tarachidia erastrioides [2]	(Guenee)	*Ambrosia*
Tarachidia semiflava	(Guenee)	
Pantheinae		
Raphia abrupta	Grote	
Acronictinae		
Acronicta lobeliae	Guenee	black cherry, Oak
Acronicta americana	(Harr.)	trees
Acronicta dactylina	(Grote)	willow, poplar
Acronicta morula	Grote & Robinson	
Acronicta lithospila	Grote	hickory, oak
Acronicta interrupta	Guenee	
Acronicta oblinita	(J.E. Smith)	*Polygonum* spp.
Simyra henrici	(Grote)	*Typha* spp., grasses & sedges
Agriopodes teratophora	(Herrich-Schaffer)	mint + *monarda*
Agaristinae		
Eudryas unio	(Hubner)	
Eudryas grata [2]	(Fabricius)	
Ellipia octomaculata [2]	(Fabricius)	
Amphipyrinae		
Achatodes zeae	(Harr.)	elderberry
Amolita fessa	Grt.,1874	grasses
Amphipoea americana	(Speyer)	grasses, sedges
Amphipoea velata	(Walker)	grasses
Amphipyra pyramidoides	Guenee	wide variety of broad-leaved trees
Apamea helva	(Grote)	
Apamea burgessi	Morrison	
Apamea lutosa	(Andrews)	
Apamea ophiogramma	(Esp.)	*Phalarus*
Apamea plutonia	(Grote)	
Archanara oblonga	(Grote)	cattails and bulrushes
Chortodes defecta	(Grote)	
Chytonix palliatricula	(Guenee)	*Aster smut*
Cirrhophanus triangulifer	Grote	*Bidens*
Condica (Platysenta) vecors	(Guenee)	
Condica (Platysenta) videns	(Guenee)	*Aster* spp., *Solidago* spp.
Cosmia calami	(Harvey)	*Oaks*
Crambodes talidiformis	Guenee	*Verbena* spp
Dypterygia rozmani	Berio	*Polygonum ?????*
Elaphria festivoides	(Guenee)	
Elaphria grata	Hubner	
Euplexia benesimilis	McDunnough	
Galgula partita	Guenee	
Luperina stipata	(Morrison)	*Spartina*

Taxon	Authors	Host plants
Magusa orbifera	(Walker)	
Meropleon ambifusca	(Newman)	unknown
Meropleon diversicolor	(Morrison)	sedges
Nedra ramosula	(Guenee)	possibly *Hypericum*
Ogdoconta cinereola	(Guenee)	*Ambrosia* spp.
Oligia modica	(Guenee)	grasses, sedges
Papaipema arctivorens	Hampson	thistle, burdock,teasel,
Papaipema baptisiae	(Bird)	*Apocynum*
Papaipema beeriana	Bird	*Liatris*
Papaipema birdi	(Dyar)	*Cicuta maculata*
Papaipema cerina	(Grote)	*Hystrix patula*
Papaipema impecuniosa	(Grote)	*Helenium, aster*
Papaipema inquaesita	Grote & Robinson	*Onoclea* (Sensitive fern)
Papaipema maritima	Bird	*Cacalia, Helianthus*
Papaipema nebris	(Guenee)	*plants*
Papaipema nepheleptena	(Dyar)	*Chelone glabra*
Papaipema rigida	Grote	Zizia
Papaipema sciata	Bird	*Veronicastrum*
Papaipema silphii	Bird	*Silphium*
Papaipema pterisii [2]		
Papaipema unimoda	(J.E. Smith)	*Thalictrum*
Plagiomimicus pityochromus	(Grote)	Ragweed
Plagiomimicus spumosum	(Grote)	
Platyperigea meralis	(Morrison)	
Proxenus miranda	(Grote)	dandelion
Spartiniphaga inops	(Grote)	*Spartina*
Spodoptera exigua	(Hubner)	*plants*
Spodoptera frugiperda	(Smith)	Polyphagous
Spodoptera ornithogalli	(Guenee)	Polyphagous
Trachea delicata	(Grote)	
Xylomoia chagnoni	Barnes and McDunnough	
Cuculliinae		
Eucirroedia pampina	(Guenee)	
Cucullia asteroides [2]	Guenee	
Oncocnemis viriditincta	Small	*Penstemon*
Hadeninae		
Achatia distincta	Hubner	crabapple, Oaks
Aletia oxygala	(Grote)	grasses
Crocigrapha normani	(Grote)	
Discestra (Scotogramma) trifolii	(Hufnagel)	many crops
Faronta diffusa	(Walker)	corn, grasses
Faronta rubripennis	(G. & R.)	*P. virgatum*
Lacanobia (Polia) legitima	(Grote)	*A. umbellatus, Salix,*
Lacinipolia lorea	(Guenee, 1852)	many herbs
Lacinipolia meditata	(Grote)	many herbs
Lacinipolia renigera	(Stephens)	many herbs
Leucania lapidaria	(Grote)	grasses
Leucania multilinea [2]		
Leucania phragmatidicola	Guenee	grasses

Taxon	Authors	Host plants
Melanchra adjuncta	(Guenee)	
Morrisonia confusa	(Hubner)	
Morrisonia evicta	(Grote)	
Nephelodes minians	Guenee	corn & various grasses
Orthodes crenulata	(Butler)	many herbs
Orthodes cynica	Guenee	
Protorthodes incincta	(Morrison)	
Protorthodes oviducta	(Guenee)	
Pseudaletia unipuncta	(Haworth)	many crops & wild plants too
Tricholita signata	(Walker)	many herbs
Ulolonche modesta	(Morrison)	
Noctuinae		
Abagrotis alternata	(Grote)	
Agrotis gladiaria	Morrison	many herbs
Agrotis ipsilon	(Hufnagel)	"almost any field or garden plant"
Agrotis venerabilis	Walker	
Agrotis vetusta	(Walker)	unknown
Eucoptocnemis fimbriaris	(Guenee)	
Euxoa detersa	(Walker)	
Euxoa messoria	(Harr.)	
Euxoa niveilinea	(Grote)	
Euxoa tesselata	(Harris)	
Euxoa velleripennis	Grote	unknown
Feltia jaculifera	(Gn., 1852)	many herbs
Loxagrotis grotei	Franclemont & Todd	*Khunia*
Noctua pronuba	(Linneaus)	
Ochropleura plecta	(Linnaeus)	
Peridroma saucia	(Hubner)	Polyphagous
Protolampra brunneicollis	(Grote)	
Rhynchagrotis cupida	(Grote)	
Spaelotis clandestina	(Harris)	woody & herbaceous plants
Trichosilia manifesta	(Morrison)	
Xestia (Amathes) bicarnea	(Guenee)	
Xestia (Amathes) smithii	(Snellen)	
Xestia dolosa	Franclemont	
Heliothinae		
Helicoverpa (Heliothis) zea	(Boddie)	wide variety of plants inc. crops
Heliothis paradoxus	(Grote)	
Heliothis phloxiphagus	G. & R.	
Pyrrhia umbra	(Hufnagel)	
Schinia arcigera	(Guenee)	*Aster*
Schinia lucens	(Morrison)	*Amorpha,* SL
Schinia lynx	(Guenee)	*Erigeron*
Schinia rivulosa	(Guenee)	*ambrosia*
Schinia saturata	(Grote)	golden aster
HOMOPTERA: leafhoppers, planthoppers, treehoppers, and frohgoppers		
Cercopidae		
Aphrophora quadrinotata	Say	
Philaenus spumarius	(L.)	
Cicadellidae		

Taxon	Authors	Host plants
Agalliinae		
Agallia constricta	Van Duzee	
Ceratagallia near sanguinolenta	*(Provancher)*	
Aphrodinae		
Xestocephalus superbus	(Provancher)	
Aphrodes bicincta	(Von Shrank)	
Athysaninae		
Amplicephalus osborni	Van Duzee	
Arthaldeus pascuellus	(Fallen)	
Athysanus argentarius	Metcalf	
Chlorotettix fallax	Sanders & DeLong	native grasses
Chlorotettix spatulatus	Osborn & Ball	*Andropogon scoparius*
Chlorotettix tunicatus	Ball	
Chlorotettix unicolor	(Fitch)	
Chlorotettix galbanatus	Van Duzee	
Cicadula cyperacea	(Osborn)	sedges
Cicadula saliens (melanogaster)	Hamilton	sedges
Cicadula straminea	(Osborn)	sedges
Colladonis clitellarius	(Say)	
Cribrus shingwauki	(Beamer & Tuthill)	*Calamagrostis*
Deltocephalus balli	Van Duzee	
Deltocephalus flavicostus	Stal	
Destria fumidus	Sanders & Delong	
Driotura gammaroides	(Van Duzee)	
Endria (Amplicephalus) inimica	(Say)	
Exitianus obscurinervis	(Stal)	
Flexamia areolata	(Ball)	*Eragrostis spectabilis*
Flexamia atlantica		
Flexamia prairiana	(Osborn & Ball)	*Sorgastrum nutans*
Flexamia delongi	Ross & Cooley	
Flexamia pyrops	(Crumb)	*Aristida*
Flexamia reflexa	(Osborn & Ball)	*Andropogon*
Graminella aureovittata	Sanders & DeLong	*Panicum virgatum*
Graminella mohri	DeLong	*Panicum virgatum*
Graminella nigrifrons	(Forbes)	
Graminella pallidula	(Gillette & Baker)	
Graminella oquaka	DeLong	*Panicum virgatum*
Graphocephala coccinea	(Forster)	
Jassus olitorius	Say	
Laevicephalus unicoloratus	(Gillette & Baker)	*Andropogon*
Latalus sayi	(Fitch)	
Latulus missellus	(Ball)	
Limotettix ferganensis (striolus)	[(Fallen)]	*Eleocharis*
Macrosteles fascifrons	(Stål)	sedges
Menosoma cincta	(Osborn & Ball)	
Mesamia nigridorsum	Ball	*Helianthus*
Neocola hieroglyphica	(Say)	
Ophiola anthracina		
Ophiola osborni	Ball	
Palus bilineatus	(Gilette& Baker)	Carex

Taxon	Authors	Host plants
Palus delector	(Sanders & DeLong)	Carex
Palus luteocephalus	(Sanders & DeLong)	Carex
Paramesus nervosus	(Fallen)	
Paraphlepsius irroratus	(Say)	
Paraphlepsius tullahomi	(DeLong)	
Paraphlepsius collitus	(Ball)	
Paraphlepsius fulvidorsum	(Fitch)	
Paraphlepsius altus	(Osborn & Ball)	
Paraphlepsius lobatus	(Osborn)	*Andropogon scoparius*
Paraphlepsius luxuria	Hamilton	
Paraphlepsius solidaginis	(Walker)	*Solidago*
Paraphlepsius maculosus	(Osborn)	
Pendarus (Remadosus) magnus	(Osborn & Ball)	*Spartina pectinata*
Polyamia apicata	(Osborn)	
Polyamia compacta	(Osborn & Ball)	
Polyamia (Deltocephalus) caperata	Ball	*Andropogon*
Polyamia rossi	DeLong	*Panicum*
Polyamia weedi	(Van Duzee)	
Polyamia similaris	Davidson & DeLong	
Prescottia lobata		
Psammotettix knullae(striatus)	Greene	
Rosenus cruciatus	(Osborn & Ball)	
Sanctanus cruciatus	(Osborn)	
Scaphytopius argutus	DeLong	
Scaphytopius acutus	(Say)	
Scaphytopius rubellus	(Sanders & DeLong)	
Scaphytopius cinereus	(Osborn & Ball)	*Amorpha* ?
Scaphytopius frontalis	(Van Duzee)	
Stirellus bicolor	(Van Duzee)	
Ledrinae		
Xerophloea major		
Xerophloea peltata	(Uhler)	
Dorydiinae		
Hecalus viridis		
Hecalus major	Osborn	*Calamagrostis*
Neocola hieroglyphica	(Say)	
Tylozygus bifida	(Say)	
Draeculacephala antica	(Walker)	
Draeculacephala constricta	Davidson & DeLong	
Draeculacephala novaboracensis	(Walker)	
Helochara communis	Fitch	
Balcluthinae		
Balclutha neglecta	(DeLong& Davidson)	
Balclutha punctata	(Thunberg)	
Balclutha sp.		
Membracidae		
Smiliinae		
Stictocephala lutea	(Walker)	
Stictocephala brevitylus	(Van Duzee)	
Acanaloniidae		

Taxon	Authors	Host plants
Acanalonia bivitatta		
Delphacidae		
Liburniella ornata		
Issidae (Caliscelidae)		
Bruchomorpha dorsata	Fitch	*Andropogon*
Bruchomorpha occulata	Ball	*Sorgastrm nutans*
Derbidae		
Cedusa sp.		
Dictyopharidae		
Scolops angustatus		
Scolops pungens		
Scolops sulcipes		
Flatiidae		
Anormenis septentrionalis	(Spinola)	
Metcalfia pruinosa	(Say)	
HEMIPTERA		
Miridae		
Lygus lineolaris	(Palisot de Beauvois)	
Coreidae		
Anasa tristis[2]	(DeGeer)	
Leptocoris trivittatus[2]		
COLEOPTERA		
Cicindelidae		
Cicindella formosa	Dejean	
Cicidella repanda[2]	Dejean	
Scarabaeidae		
Bothynus gibbosus[2]	(DeGeer)	
Euphoria linda[2]	(Linnaeus)	
Osmoderma eremicola[2]	(Knoch)	
Pelidnota punctata[2]	(Linnaeus)	
Meloidae		
Epicautta pensylvannica[2]		
Cantharidae		
Chauliognathus pensylvannicus	(DeGeer)	
Dytiscidae		
Cybister fimbriolatus 2	Say	
Lampyridae		
Ellychnia californica 2		
Cerambycidae		
Parandra b. Brunnea[2]	(Fabricius)	
Prionus imbricornus[2]	(Linnaeus)	
Psyrassa unicolor	(Randall)	
Tetraopes basalis[2]		
Xylotrechus colonus	(Fabricius)	
Orthosoma brunneum	(Forster)	
Chrysomelidae		

Taxon	Authors	Host plants
Galerucinae		
Diabrotica longicornus		
Empolinae		
Chrysochus auratus	(Fabricius)	
Cryptocephalinae		
Pachybrachis spumarius group		
Erotylidae		
Megalodacne heros 2	(Say)	
Silphidae		
Nicrophorus marginatus 2		
Nicrophorus tomentosus 2		
Nicrophorus orbicollis		
DIPTERA		
Syrphidae		
Anthrax analis[2]		
Tubifera tenax[2]		
Allograpta obliqua[2]		
Calliphoridae		
Phaenicia sericata[2]		
Sarcophagidae		
Sarcophaga haemorrhoydalis[2]		
Tachinidae		
Archytas apicifer[2]		
Scathophagidae		
Scatophaga stercoraria[2]		
Tabanidae		
Tabanus astratus 2		
Tephritidae		
Rhagoletis completa 2		
HYMENOPTERA		
Ichneumonidae		
Scambus hispae 2		
Sphecidae		
Bembex spinolae 2		
Chalybion californicum 2		
Chlorion aererium 2		
Sceliphron caementarium 2		
Sphex ichneumonius 2		
Vespidae		
Mischocyttarus flavitarsus 2		
Vespula maculafrons 2		
Vespula maculata 2		
Pelecinidae		
Pelecinus polyturator 2		
Siricidae		
Tremex columba 2	(Linnaeus)	

Taxon	Authors	Host plants
Apidae		
Bombus pennsylvanicus		
Apis mellifera [2]		
Halictidae		
Agapostemon virescens [2]		

[2] Species reported by Kurt Laurent (2002).
[3] Species reported by John and Cynthia McKee.

Appendix 2. Conservation Status Designations.

The Natural Heritage Network and The Nature Conservancy have developed a method for evaluating the health and condition of both species and ecological communities. This assessment leads to the designation of a conservation status rank; for species this provides an approximation of their risk of extinction.

Rare species are particularly vulnerable to both human-induced and natural hazards. As a result, rarity is a key predictor of a species' risk for extinction. Although rarity may seem a straightforward concept, it is complex to characterize. For this reason, Natural Heritage biologists evaluate four distinct characteristics of rarity for each species when assessing its conservation status: the total population size, or number of individuals of the species; the number of different populations or occurrences of the species; the extent of its habitat; and the breadth of the species' geographic range. Scientists also factor in other considerations to determine conservation status. For example, population trend - whether a species' numbers are increasing, stable or declining - is a key factor. Extinction, after all, is simply the ultimate decline in population numbers. We must also consider threats to the species - human and natural - since these are important in predicting their future decline.

Conservation status ranks are based on a one-to-five scale, ranging from critically imperiled (G1) to demonstrably secure (G5). Species known to be extinct, or missing and possibly extinct, also are recorded. In general, species classified as vulnerable (G3) or rarer may be considered to be "at risk". (This system is also used at the state level to produce status ranks ranging from S1 through S5)

Conservation status assessments must be continually reviewed, refined and updated. During 1998 alone, Colorado Natural Heritage Program and Nature Conservancy scientists re-appraised and updated the status of almost 1,400 species. Natural Heritage biologists rely on the best available information in making and documenting conservation status determinations, including such sources as natural history museum collections, scientific literature, previously published reports, and documented sightings by knowledgeable biologists. To augment this knowledge, Heritage biologists conduct extensive field inventories and population censuses, especially targeting those species thought to be imperiled or for which few existing data are available. Most changes in status assessments tend to reflect this improved scientific understanding of the condition of the species.

Designed to assist in setting research and protection priorities, these conservation status ranks are biological assessments rather than legal categories. They do not confer legal protection, as do listings under the U.S. Endangered Species Act.
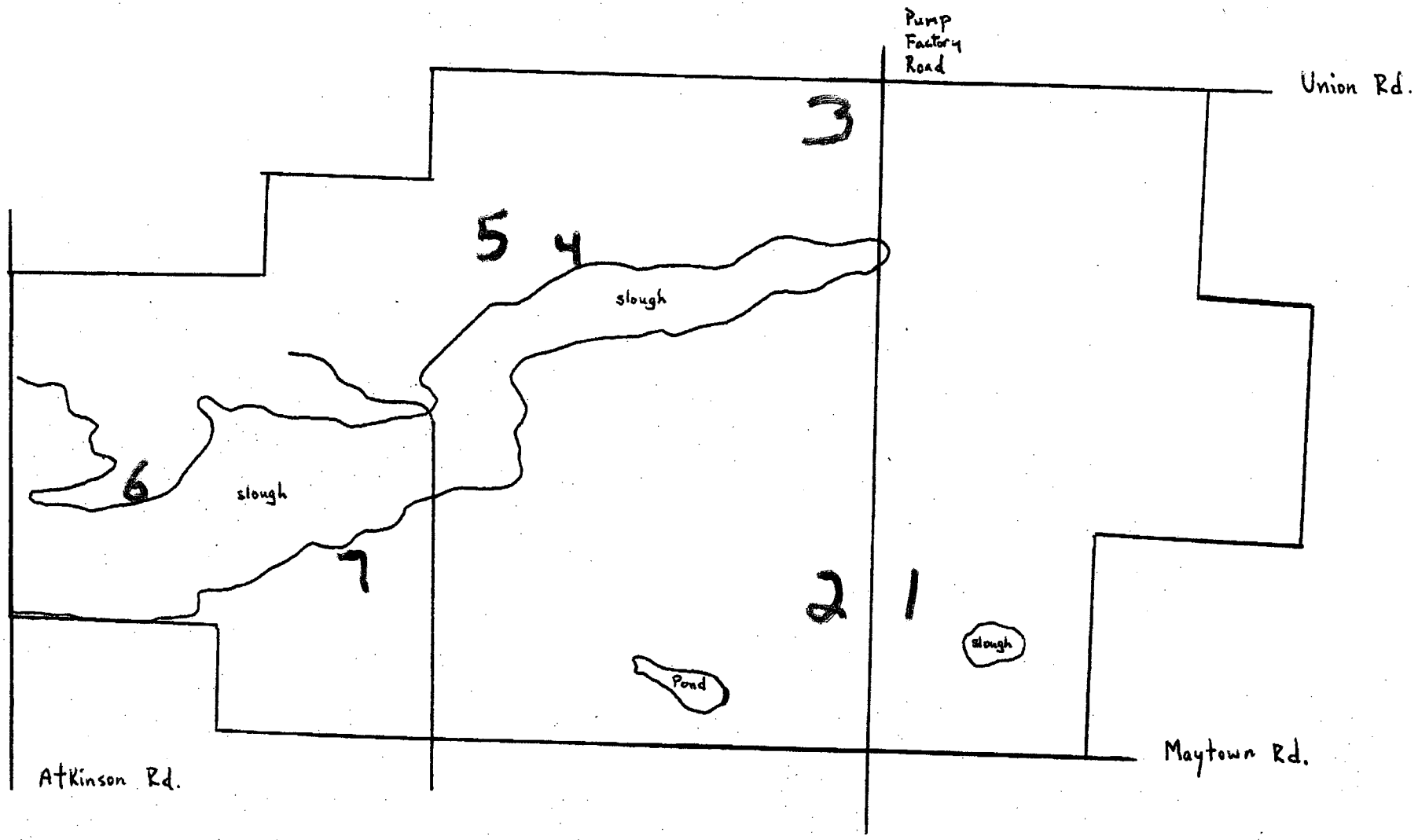
Figure 1. Green River State Wildlife Area