85-13

BRIDGEVIEW PARK DISTRICT

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BRIDGEVIEW, ILLINOIS 60455
PHONE: 594-1818

8 September 1985

Carl N. Becker
Natural Heritage Section Manager
Forest Resources & Natural Heritage
Illinois Dept. of Conservation
Lincoln Tower Plaza
524 South Second Street
Springfield, Illinois 62701-1787

Dear Mr. Becker:

We are please to submit to you our final report pursuant to our nongame conservation contract dated 24 May 1985 for the preliminary insect survey of the Illiniwek Nature Area.

In addition we enclosed a bill for the services we rendered per the terms of the contract and our proposal for same dated 19 April 1985.

Should you have any questions about the bill or the final report please direct them to my attention immediately. We thank you for the opportunity to work with the Illinois Department of Conservation.

Sincerely,

Steven Landek

Steven Landek
Superintendent of Parks

SL/z

Enclosures

CONTRACTUAL SERVICES INVOICE
BRIDGEVIEW PARK DISTRICT
31 August 1985

Bridgeview Park District assumed all costs beyond the contractual services itemized in the proposal.

Contractual Services

Bridgeview Park District retained the services of Tallgrass Associates to conduct the field work and prepare the final report for submission under the contract.

Tallgrass Associates, Environmental Consultants:
Orland Park, Illinois

Field Biologist - 20.5 hours	$40.00	$820.00
(includes field and lab time, including submission of final field report)		
Insect Taxonomist/Ecologist - 7.5 hours	$20.00	$150.00
(preliminary taxonomic identification of specimens collected)		
	Sub-Total	$ 970.00

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District re-imbursed at .19/mile

12 Trips between Orland Park & Bridgeview (96 m)	$ 18.24
2 Trips between Orland Park & Park Forest (60 m)	$ 11.40
Sub-Total	$ 29.64

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TOTAL FUNDS DUE $ **999.64**

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The Bridgeview Park District
Illiniwek Nature Area

Preliminary Insect Inventory

A Summary Report

August, 1985

Prepared under Contract
with
Illinois Department of Conservation

Funded
through
Nongame Conservation Checkoff Fund

Prepared by
Tallgrass Associates
Orland Park, Illinois

INTRODUCTION

The Bridgeview Park District's Illiniwek Nature Area represents a disturbed tallgrass prairie remnant on natural mesic soils. The current insect population of the prairie represents immigrations from nearby lawns, fields, and railroad ROW as well as resident populations. The enhancement of these insect populations with species either common or specific to the original prairie might be accomplished through the establishment of additional native prairie grasses and forbs which can serve as both host and habitat for such species. During the summer of 1985, a study was conducted to determine the which insect families where present and whether or not any desirable insect species existed there. A reference sample of insects were collected. This site had a coefficient of community (Jaccard Coefficient) of 25% when compared to the species found in a similarly sized site in Richton Park. The Sorensen coefficient was 0.40. This sampling suggests that this site may be significantly different from the Richton Park site (a reconstruction). Only few wet-soil families currently inhabit the site. The current management practice of burning probably should be continued. Reseeding prairie forbs in more public sections of the prairie will aid the migration of resident insect populations to these disturbed areas.

PROJECT STATEMENT

The goals of this project were:

1. to collect and inventory insects of the prairie, with emphasis, on the Coleoptera, Lepidotera, and Formicidae species.
2. to evaluate the collection and make management recommendations for any prairie-sensitive species.

METHODS

Insect Sampling:

The prairie was divided into quadrants paralleling the compass lines. Insects were non-randomly collected from the northeast, southeast, and southwest quadrants only. The northwest quadrant was excessively disturbed and contained some fill. Therefore only the least disturbed sections of the prairie were sampled. Both the top and mid-sections of the vegetation were swept. Insect samples, collected using sweep nets, were pinned and mounted for taxonomic identification.Insects were immediately placed in killing jars. Contract time and funding constraints precluded a more scientific sampling of insects. Nevertheless it is consistent with methods other studies have used (DeMauro 1984). Generally the ground surface areas were not sampled. The dates of the field samples were:

27 July 1985
05 August 1985
09 August 1985
20 August 1985

Due to time constraints and extreme difficulty of identifying certain groups of insects to species only a preliminary identification to family was possible for this reference set. While species were not determined in general, conspecificity was noted in preparing the work tables for this study. A sampling of plant dominants using quadrats was not performed to save time. Plant dominants were generally quite clumped and visible. No new information pertinent to this study seemed to be gained by such a sampling. In lieu of this omission, previous studies of this prairie type were re-examined (Mulé, unpublished) for vegetative composition.

RESULTS

These activities resulted in the following accomplishments:

1. Development of a set of specimens representing the insect families and species present at the site for future comparative work.
2. A preliminary analysis of the familial distribution of insects at this site.
3. A preliminary comparative study of that distribution with insects found in a prairie reconstruction as well as larger naturally occurring prairies in the same geographical area.

After initiating this study, it became quite obvious that neither time or funding would allow a complete taxonomic identification down to species level for the collected insect specimens (e.g. some Dipterans require 30 or more minutes of scope time each). Lack of specific identification, however, does not preclude drawing conclusions based on family conspecifics. So arrangements were made to compare, in a general way, how the insect samples from Illiniwek Nature Area concurred with a simultaneous insect study at Rich South High School Prairie-Woodland Preserve. The Rich South study provides an acceptable substitute for referencing diversity in the collections. In addition, these data may be reviewed in the context of family distributions in unpublished data on Lockport and Romeoville prairies.

Although limited in their usefulness, coefficients of community may be calculated for the Rich South site and the Bridgeview site (Brower & Zar, 1977). Using the Jaccard coefficient, there is a .25 coefficient between the two sites. Using the Sorensen coefficient, that value is .40. Although the species numbers are similar between the sites, the Rich South demonstrates a greater representation of "wet" species (dragonflies and certain marsh flies). There the lower end of the prairie virtually grades into a man-made cattail marsh/pond. The Bridgeview site is not near any significant body of water. However, in nearly every other family, the Bridgeview site demonstrated a greater number of species. Table 1 presents the family distributions for insects found in the two small prairies and Panzer's study of Lockport and Romeoville.

DISCUSSION[1]

A brief analysis of the insect family list (Table 1) quickly indicated that the following families are not well-represented at Illiniwek Nature Area:

- Spread-wing damselflies
- Narrow-wing damselflies
- Pygmy grasshoppers
- Damsel bugs
- Mirid bugs
- Seed bugs
- Leafhoppers
- Long-horned beetles
- Most butterflies
- Most moths
- Robber flies
- Picture-winged flies
- Apids

Species groups which seem to be well represented at Illiniwek are:

- Short-horned grasshoppers
- Spittlebugs
- Large planthoppers
- Chrysomelidae beetles
- Ladybird beetles
- Tachinid flies
- Sphecidae

No doubt many species in these groups were missed in our sampling. However, relative to other similarly-sized prairies in the area, the Bridgeview site lacks some of the species attracted to showy forbs, especially the butterflies and moths, but not quite as many as Rich South.

A review of Table 2 indicates that the Bridgeview site shares no more than 41% in common with species found at a Rich South prairie of similar size. Yet the number of species collected were nearly identical at both sites. Interestingly, Romeoville and Lockport prairies (also in the same order of magnitude in size) show rather close diversity numbers (Tables 1 & 3)[2]. The percent number of species unique to Bridgeview and Rich South were about the same (60%). While not statistically tested, this same attribute is much lower for Lockport and Romeoville. The question being asked is (but not

[1]For purposes of discussion, a familiarity with the IDOC proposal elements and rationale is assumed here.

[2]Table 3 indicates that the species common to both Romeoville and Lockport prairies is not appreciably higher than found between Rich South and Bridgeview (no statistical test, however, was performed). The data might be expected to converge if sampling continued throughout the whole season.

answered): How does size affect uniqueness of insect species? And are unique species the same as the conservative prairie species?

Prairie butterflies and moths are noticeably absent from here; one's common experience might suggest that such species may be, in part, "quality indicators." This suggests that the desirable prairie insect species here are more depauperate than larger prairies such as Lockport. Yet the Indiana Harbor Belt tracks run along this prairie. There are still quite a few remnants along them. Colonization may be assumed to be active here. While we might speculate why the Lepidopterans aren't more abundant, it is risky to state any one reason why more didn't show up (the most probable causes being sampling error and daily climate.)

Other species are previously known from the site, such as buckeyes or red admirals, but were not collected on any of the field days. It seems likely that leaf and planthoppers should be present, but perhaps the sparseness of prairie grasses in some areas significantly reduces the population sizes. The prairie forbs here are mostly confined to the southwest and western sectors of the area. Prairie grass thins out among the disturbed area where small ragweed and wild carrot dominates. Species abundance tends to follow these spatial patterns. In this prairie, many forbs are clumped, possibly providing a minimum critical "attracting size" (e.g. rattlesnake master or ironweed). This apparently causes insect populations to be extremely local in distribution (blister beetles only on grass-leaved goldenrods!). Special plantings with showy forbs, out in the prairie, should help increase the insect species richness.

RECOMMENDATIONS

Based on this insect survey, the following recommendations are made for Park District management of the area:

1. Continue the practice of alternate year/partial site burning of the prairie site.
2. Establish new prairie forbs (seeds or seedlings) as hosts out in those quadrants now dominated by wild carrot or ragweed.
3. Re-establish the small pond in the northeast quadrant to provide aquatic habitat for those species with aquatic larvae.
4. Re-evaluate the insect community at the site next season. The prairie has a good number of beetles, exceeding any other site listed in Table 1.

Although detailed species determinations were not made, it seems that many of the ants, wasps, beetles, flies, and hoppers are original residents of this area. The forms observed are typical for prairie remnants but unusual for old fields or new reconstructions. Although small (84 species on 1.5 acres compared to 136 species on 249 acres of the Lockport prairie), this prairie holds potential as a significant sanctuary for the now uncommon prairie insect community.

REFERENCES

Borror, Donald & Richard White. 1970. A Field Guide to the Insects of America North of Mexico. Boston: Houghton Mifflin Co.

Brower, James & Jerrold Zar. 1977. Field and laboratory methods for general ecology. Dubuque: Wm. C. Brown Co.

DeMauro, Marcella. 1984. "A Vegetational and Plant Community Survey of Lockport Prairie Nature Preserve and the Romeoville Prairie." Report to the Forest Preserve District of Will County. June, 1984.

TABLES

CONTRACT INVOICE

Original enclosed with cover letter.

Table 1. List of insect families noted at selected prairie study sites. Data for the first two sites (Lockport Prairie LP and Romeoville Prairie RV) are derived from R. Panzer in DeMauro (1984). The last two sites (Rich South RS and Illiniwek Nature Area BP) represents data from the study described in the report. See endnote [1].

Order/Family	Site LP	RV	RS	BP	RS/BP DIFF
ODONATA (Anisoptera -- Dragonflies)					
Libellulidae (Common Skimmers)	7	5	5	2	
Aeshnidae (Darners)	2	1	0	1	
Sub-Total	9	6	5	3	2
ODONATA (Zygoptera -- Damselflies)					
Coenagrionidae (Narrow-winged Damselflies)	2	2	2	1	
Lestidae (Spread-winged Damselflies)	2	0	0	0	
Calopterygidae (Broad-winged Damselflies)	2	0	0	0	
Sub-Total	6	2	2	1	1
ORTHOPTERA (Ensifera -- Long-horned Grasshoppers)					
Tettigoniidae	5	4	1	1	
Sub-Total	5	4	1	1	0
ORTHOPTERA (Caelifera -- Short-horned Grasshoppers)					
Acrididae (Short-horned)	8	8	1	4	
Tetridgidae (Pygmy)	1	2	0	0	
Gryllidae (Crickets)	1	1	1	1	
Sub-Total	10	11	2	5	-3
PHASMATODEA (Walkingsticks)					
Phasmidae	0	0	1	0	
Sub-Total	0	0	1	0	1
HEMIPTERA (True Bugs)					
Reduviidae (Assassin)	0	0	0	1	
Tingidae (Lace)	0	0	1	1	
Cydnidae (Burrower)	0	0	1	0	
Miridae (Plant Bugs)	4	3	3	1	
Phymatidae (Ambush)	1	1	1	1	
Thyreocoridae (Negro)	1	0	0	0	
Nabidae (Damsel)	1	2	0	0	
Pentatomidae (Stink)	1	2	1	2	
Alydidae (Broad-headed)	0	1	0	0	
Lygaeidae (Seed)	0	1	0	1	
Sub-Total	8	10	7	7	0

Table 1. (Continued)

HOMOPTERA (Hoppers)						
Cicadellidae (Leafhoppers)		6	3	0	0	
Acanaloniidae (Acanaloniid Planthoppers)		1	1	0	0	
Membracidae (Treehoppers)		2	2	2	1	
Cercopidae (Spittlebugs)		2	1	4	4	
Cicadidae (Cicadas)		1	0	0	0	
Aphididae (Aphids)		1	0	1	1	
Fulgoridae (Large Planthoppers)		0	0	1	3	
	Sub-Total	13	7	8	9	-1
NEUROPTERA (LACEWINGS)						
Chrysopidae (Green Lacewings)		0	1	1	1	
Hemerobiidae (Brown Lacewings)		0	0	0	1	
	Sub-Total	0	1	1	2	-1
COLEOPTERA (Beetles)						
Chrysomelidae (Leaf)		6	5	3	8	
Cicindelidae (Tiger)		0	1	0	0	
Coccinellidae (Ladybird)		3	4	0	3	
Cerambycidae (Long-horned)		1	1	1	0	
Cantharidae (Soldier)		0	1	0	1	
Meloidae (Blister)		0	1	0	1	
Melandryidae (False Darkling)		0	0	1	0	
Dermestidae (Dermestids)		0	0	1	1	
Scarabaeidae (Dung)		0	0	1	0	
Curculionidae (Snout)		0	0	1	1	
	Sub-Total	10	13	8	15	-7
LEPIDOPTERA (Rhopalocera -- Butterflies)						
Danaidae (Monarchs/Milkweed)		0	0	1	1	
Hesperidae (Skippers)		8	8	0	2	
Papilionidae (Swallowtails)		1	1	0	1	
Satyridae (Nymphs & Satyrs)		2	0	0	1	
Pieridae (Sulfurs & Whites)		3	3	1	2	
Lycaenidae (Blues & Hairstreaks)		4	3	0	0	
Nymphalidae (Brush-footed)		9	6	0	0	
	Sub-Total	27	21	2	7	-5
LEPIDOPTERA (Heterocera -- Moths)						
Ctenuchiadae (Ctenuchidae)		1	2	0	0	
Noctuidae (Noctuid)		9	6	0	0	
Pyralidae (Pyralid)		2	2	2	1	
Arctiidae (Tiger)		2	2	1	0	
Agaristidae (Forester)		1	0	0	0	
Geometridae (Measuringworm)		2	2	1	0	
Sphingidae (Sphinx)		3	1	0	0	
Zygaenidae (Smoky)		1	0	0	0	
Lasiocampidae (Tent Caterpiller)		1	1	0	0	
Sesiidae (Clear-winged)		1	1	0	0	
	Sub-Total	23	17	4	1	3

Table 1. (continued)

DIPTERA (Flies)						
Dolichopodidae (Long-legged Flies)		0	0	1	0	
Chloropidae (Frit Flies)		0	0	1	0	
Chironomidae (Midges)		0	0	1	0	
Asilidae (Robber)		2	1	0	1	
Bombyliidae (Bee Flies)		1	1	0	0	
Otitidae (Picture-winged)		1	1	0	0	
Syrphidae (Hover Flies)		1	1	4	2	
Tephritidae (Fruit Flies)		0	0	1	2	
Tachinidae (Tachinid)		1	1	1	3	
Sarcophagidae (Flesh)		0	0	1	0	
Stratiomyidae (Soldier Flies)		0	0	2	0	
Tabanidae (Deer)		1	1	0	0	
Trupaneidae (Fruit)		1	1	0	0	
Sciomyzidae (Marsh Flies)		1	1	0	0	
	Sub-Total	9	8	12	8	4
HYMNEOPTERA (Bees, Wasps, & Ants)						
Siricidae (Horntails)		1	0	0	0	
Vespidae (Vespids)		2	2	1	1	
Sphecidae (Sphecids)		0	2	1	3	
Ichneumonidae (Ichneumons)		1	1	1	1	
Megachilidae (Megachilids)		0	0	0	1	
Apidae (Apid)		2	5	2	2	
Formicidae (Ants)		0	0	2	1	
Colletidae (Yellow-Faced Bees)		0	0	0	1	
Halictidae (Halictid/Sweat Bees)		0	0	1	0	
Andrenidae (Andrenid Bees)		0	0	1	0	
	Sub-Total	6	10	9	10	-1
	TOTAL	136	123	70	84	-14

1. Data used to construct these tables represent a superset of the data used to prepare the following tables. Hence totals do not agree. Panzer lists several species within a number of families where he simply lists them without any indication as to which prairie they were found. In preparing this table, these species were omitted from these calculations unless there was corollary evidence to suggest they were present at both sites.

Table 2. A summary comparison of insect species found at Illiniwek Nature Area BP (a prairie remnant) and Rich South Prairie-Woodland Preserve RS (a reconstruction) during July-August, 1985. This summary excludes a few common species included in Table 1.

		RS	BP
Acreage (apprx.)		2.5	1.5
Total Species Found Both Sites*	100		
Total Species Identified Each Site*		62	63
Species Common to Both Sites	25	40.3%	39.7%
Species Unique to Each Site	75	37 (59.6%)	38 (60.3%)

*approx. 95% collected sample

Table 3. A summary comparison of insect species found at Lockport Prairie LP (a prairie remnant) and Romeoville Prairie RV (also a remnant) during June-August, 1983 (from R. Panzer in DeMauro 1984).

		LP	RV
Acreage		249	200
Total Species Found Both Sites	175		
Total Species Identified Each Site		126	108
Species Common to Both Sites	61	48.4%	56.4%
Species Unique to Each Site	114	65 (51.5%)	47 (43.5%)

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BRIDGEVIEW PARK DISTRICT
31 August 1985

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