Final Report on Results of 1995 RJ/KOSE Grant to inventory macro-Lepidoptera at three Indiana Bald Cypress Swamps

INTRODUCTION

Funding totalling $4,500 was provided by the Rodney Johnson and Katharine Ordway Stewardship Endowments and The Nature Conservency on a matching basis to the Principal Investigator, Charles V. Covell Jr., PhD., Professor of Biology, University of Louisville, Kentucky. The purpose of the grant was to assess the moth fauna, particularly "macro-Lepidoptera" (larger moths) at 3 baldcypress tracts in Posey Co., Indiana: Of special interest was the presence and extent of occurrence of any cypress swamp "specialists" - species feeding only on baldcypress or other plants in the cypress community and not found in others.These sites are the Goose Pond Cypress Slough, Gray Estate, and the Twin Swamps State Nature Preserve. Some of the funds were used by the the co-PI, Dr. John Shuey, Director of Science and Conservation Biology, INFO, from the matching grant from TNC for procurement of light traps to make night collections, and to fund his activities in studying butterfly fauna and helping guide the PI to appropriate collecting sites within the 3 tracts. A preliminary report was filed on 27 December, 1995 to fulfill my commitment to conduct collections and prepare, identify, and tabulate moths from the 3 sites. The present report gives results of further analysis of the material collected, and lists observations and recommendations based on the finding.

MATERIALS AND METHODS

Three New Jersey type blacklight insects, equipped to operate on storage batteries, were purchased, along with a supply of ethyl acetate to place in the collecting containers to kill insects that were trapped. Trips to the 3 Posey Co., Indiana sites were made on May 18 (Shuey alone), June 12 (Covell, Shuey, and 2 student assistants John Enz and Paul Florence), and by the two students for further collecting on June 30, July 28, August 22, and October 1. Light traps were set up in each of the 3 tracts during those nights, and the contents taken back to the University of Louisville the following day for preparation. Moths were pinned and labelled, and over time identified as closely to the species level as possible. This work was done by me with the assistance of students Enz and Florence.

About 1,500 moths were collected, and most of these have been pinned and labelled as to locality and date. A few have also been spread for better study. I have been in the process of sorting and identifying these specimens, and did some of this work with the help of Drs. Douglas C. Ferguson and M. Alma Solis, USDA research scientists at the Smithsonian Institution, Washington, DC, during Dec. 5-8, 1995.. While some material still has not been identified to genus and/or species, these represent material in such poor condition that such identification is extremely difficult or impossible. I believe that wat is presented in the Appendix represents a good picture of the moth fauna at the 3 sites, given the occasional nature of the collecting. Some micro-lepidoptera are included, but the main body of material are what are called "macro-moths" representing the medium and large-sized moths. Specimens

are stored at present at the University of Louisville Insect Collection, the major Lepidoptera repository in the Indiana-Kentucky area. They will be kept separate from the main collection for the time being.

RESULTS

The preliminary report listed 677 moth specimens representing 151 identified species. The final Appendix tabulates identifications by locality (each of the 3 cypress tracts) and dates of collection. This final Appendix version lists 1,251 specimens representing 203 species. Species that were added after the preliminary form was submitted are in smaller, less bold type, so comparisons could be made. Moths were identified and named according to Covell (1984) supplemented by other more recent works, notably Rings *et al.* (1992). The Appendix lists the species in order of the Hodges *et al.* (1983) checklist. Totals for each taxon identified are in the right-hand column.

Collections varied in quantity from one date to another due largely to weather conditions. Stormy weather on the night of July 28 reduced to catch to very few specimens. By contrast, the June 30 trip was the most successful in variety and total numbers. The number of collections, roughly one per month from May to October, was minimally sufficient to characterize the moth fauna, but some very interesting results emerged.

DISCUSSION AND RECOMMENDATIONS

I would divide the moths listed in the Appendix into three categories: (1) widespread mesophytic forest and field species, expected in the area; (2) pest species drawn from nearby agricultural areas, and (3) cypress swamp community species of particular interest for the sake of conservation of Indiana's total insect fauna.

The bulk of the species listed in the Appendix are widespread, common and not characteristic of cypress habitats, although they are at home there. These are the species for which there is not special comment given under "Remarks" in the Appendix. It is important, however, to know that they exists in the 3 sites, as they are components of a healthy eastern forest habitat, and since there is no comprehensive list of Indiana moths yet published, their identification is valuable information. Many are "general feeders," using a variety of foodplants. Some of those foodplants may be cypress swamp specialists, but too little is known of the feeding habits of North American moths to predict their impact on the cypress swamp community.

Of the pest species, all are widespread and often abundant, since humans provide unlimited food in the form of corn, garden crops, and fruit trees. Examples of common pests listed are the Oblique-banded Leafroller, the European Corn Borer, the Tomato Hornworm moth, the Velvetbean Caterpillar Moth, and the various cutworms and armyworm species. Of these the European Corn Borer was the most abundant in samples, reflecting a draw from nearby agricultural areas (especially at the Goose Pond site). The presence of these pest species are not, in my opiniong, significant with regard to the health of the cypress swamp preserves.

The most interesting group of moths are the ones indicated as "cypress feeders"

or as members of the "cypress swamp community." These I have indicated from experience with similar sites and faunas in Kentucky, and from experience there know these species to be restricted to such habitats. It is appropriate to consider that the northern limits of such species coincide with the northern limits of cypress habitat.

There are 2 species of *Cutina* (Noctuidae) and one each of *Crambus* and *Pococera* (Pyralidae) that appear to the Smithsonian scientists as undescribed. They are also new state records (along with numerous other species listed here). When named and described the new species will probably prove to represent the northern extensions of the ranges of these species. They are definitely associated with cypress swamps, and their foodplants may be bald- cypress. Another species, *Nemoria elfa* (described by Ferguson in 1969) was found in good numbers, and constitutes a new northern limit to the known range of this species. It probably feeds on swamp trees, possibly gums and/or baldcypress. Several other specimens are completely unidentified so far, and may also constitute new species to science. Other species that are associated with cypress habitat and which may find their northern-most limits in these sites are: *Epipagis huronalis, Semiothisa aequiferaria, Pero zalissaria, Cutina distincta,* and *Parapamea buffaloensis.* The 4 species of aquatic moths (*Munroessa icciusalis, M. gyralis, Synclita obliteralis,* and *Bellura gortynoides*) are widespread but significant of healthy, natural aquatic habitats. One cypress feeder expected but not collected was the Cypress Sphinx, *Isoparce cupressi.* It probably inhabits at least one, and probably all, of the 3 sites, but was missed in collections. It has been found in SW Kentucky.

With respect to comparing the faunas of the 3 cypress tracts, the results show that the Twin Swamps preserve showed by far the highest diversity of the 3 with 151 species recorded. Numbers of different species for the Goose Pond and Gray Estate sites were 103 and 91 species, respectively. This should not be taken as a valid reflection of total moth diversity among the 3 sites, however, as placement of traps was made largely on the basis of accessibility in wet and muddy conditions, and the situation of the Twin Swamps trap might well have proved to be unusually good.

Although 203 species based on 1,251 identified specimens cannot give a complete picture of the moth fauna and occurrence of species in the 3 tracts, we have a good beginning. The bulk of the species identified so far are general and common constitutents of forest and openings in this part of the country. However, no moth surveys have ever been carried out in southwestern Indiana to my knowledge, and these data will turn up range extensions both north and south with respect to ranges as we have known them to be. So little work on moth inventory, and also on life histories of moth species, has been done, that studies such as this present one should be continued if at all possible, with more parts of the tracts sampled, and some collection and rearing of larvae from cypress attempted.

I do not feel that there are any species identified so far that are Endangered or Threatened. The cypress habitats as such, however, are among the northernmost in the Mississippi River drainage, and their protection should be considered very important components of Indiana wildlife protection and management. The 4 new species should be described and named, and studied from the standpoint of their place in the cypress swamp habitat.

I recommend the following, based on the results of this study:

1. Maintain the integrity of all 3 cypress swamp habitats
2. Support further inventory of Lepidoptera and other wildlife in all 3 sites
3. Develop an overall list of the Lepidoptera of Indiana, with annotations of localities and occurrence dates (anticipating future Gypsy Moth outbreak effects)
4. Provide nectar sources by allowing some fallow fields and openings to be maintained nearby for adult Lepidoptera and other wildlife
5. Educate the public as to the importance and uniqueness of cypress swamp wetland habitats as part of Indiana's heritage

ACKNOWLEDGEMENTS

I wish to thank Dr. John Shuey for his assistance in obtaining the funding and permissions for this study, and to John Enz and Paul Florence for their help in collecting, preparing and identifying the specimens included in the results. I also thank the Rodney Johnson and Katharine Ordway Stewardship Endowments and The Nature Conservency for their support.

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Respectfully submitted,

Charles V Covell Jr.

Charles V. Covell Jr., Ph.D.
June 6, 1996

Appendix: List of moths recorded at 3 cypress swamp preserves in Posey Co., Indiana, 1995.

		Locality #1: Goose Pond						Locality #2: Gray Estate						Locality #3: Twin Swamps							REMARKS:
Hodges	DATES:	5/18	6/12	6/30	7/28	8/22	10/1	5/18	6/12	6/30	7/28	8/22	10/1	5/18	6/12	6/30	7/28	8/22	10/1	**Total**	
Cat. #:	**Genus & species name:**																				
457	**Thyridopterix ephemeraeformis**						1												1	2	pest of many tree species
951	**Machimia tentiforella**						1													1	
1046	Callima argenticinctella			1																1	
1443	Mompha eloisella															1				1	
1444	Mompha circumscriptella															1				1	
1515	Limnaecia phragmitella															1				1	
2401	**Atteva punctella**				1	1	3										1	1	4	11	ailanthus webworm moth
3037	Eucosma agricolana															1				1	tufted apple-bud moth
3174	Epiblema numbersana															9				9	
3370	Ancylis platanana															1			1	2	
3594	Pandemis limitata						1						1						1	3	
3623	**Argyrotaenia quercifoliana**																		1	1	
3635	Choristoneura rosaceana						15						4			1		5	7	32	oblique-banded leafroller
3658	Archips purpurana						1													1	
3695.1	Sparganothis sp.						1													1	
3740	**Platynota idaeusalis**						1												1	2	
4650	**Norape ovina**				1					1	2					2		1		7	
4675	**Isochaetes beutenmuelleri**															1				1	
4700	**Sibine stimulea**															1				1	caterpillar stings
4744	Chrysendeton medicinalis															1				1	
4748	**Munroessa icciusalis**			1																1	larva aquatic
4751	Monroessa gyralis			1																1	larva aquatic
4755	**Synclita obliteralis**									1						1				2	larva aquatic
4883	**Lipocosma adelalis**															6				6	
4949	**Ostrinia nubilalis**	1		2	2	29	6	1					2			1		17	3	64	pest: European Corn Borer
4953	**Phlyctaenia coronata**					1														1	
5040	**Pyrausta bicoloralis**						1						2			1		1	2	7	
5069	**Pyrausta tyralis**																	8	1	9	
5071	Pyrausta acrionalis						2													2	
5079	**Udea rubrigalis**			2	1	5	1	5		9			3			6		2		34	pest: Celery Leaftier
5119	**Loxostegopsis curialis**																		2	2	
5142	**Diacme elealis**																	2		2	
5147	**Epipagis huronalis**												1						1	2	from deep South
5156	**Nomophila nearctica**	1					2			1						1		1	2	8	

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5159	**Desmia funeralis**					2	1	2			1		1				2	5	1	15	pest: Grape Leaffolder
5169	**Hymenia perspectalis**																		1	1	
5176	**Anageshna primordialis**																	1		1	
5226	**Palpita magniferalis**			2		1		5		1			4				1	10		24	
5227	Palpita aenescentalis					1														1	
5243	**Pleuroptera silicalis**						3						6						1	10	
5272	Herpetogramma bipunctalis	1			1	5	1	2												10	
5280.1	Herpetogramma n. sp.												2							2	
5362	**Crambus agitatellus**			6						4						4				14	
5362.1	Crambus unident. sp. #1															1				1	perhaps undescribed sp.
5362.2	Crambus unident. sp. #2															1				1	
5518	**Aglossa cuprina**															3				3	
5420	Microcrambus elegans																	1		1	
5524	**Hypsopygia costalis**						1						2						4	7	
5532	**Herculia infimbrialis**					2							4						5	11	
5533	**Herculia olinalis**					3		1					1							5	
5620.1	**Pococera n. sp.**									1						3				4	
5808	Tlascala reductella															1				1	
6053	**Peoria approximella**															1				1	
6273	**Itame pustularia**			2						1							5			8	lesser maple spanworm
6322	**Mellilla xanthometata**					2							2				6	1		11	
6326	**Semiothisa aemulataria**															1				1	
6335	**Semiothisa aequiferaria**			8	1	7	12	4		3			4			3		20	3	63	cypress community
6352	**Semiothisa granitata**						1													1	
6362	**Semiothisa continuata**															1				1	cypress feeder
6386	**Semiothisa ocellinata**																	1		1	
6405	**Semiothisa gnophosaria**			7		4				4			5			3		5	5	33	willow feeder
6419	**Enconista dislocaria**															1				1	
6443	**Glenoides texanaria**			1			4									1		1	6	13	
6583	Anacamptodes ephyraria				2	5	10							3	1			19	10	50	
6586	Anacamptodes defectaria						1											1		2	
6590	Anvitrinella pampinaria					3	1													5	
6620	**Melanolophia canadaria**			2						2						2		5		11	
6654	**Hypagyrtis unipunctata**															1		2		3	
6667	**Lomographa vestaliata**																	1		1	
6743	Xanthotype sospeta							2												2	
6737	Euchlaena tigrinaria							1												1	

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6726	Euchlaena obtusaria							1												1	
6752	**Pero zalissaria**																		1	1	cypress swamp community
6753	**Pero honestaria**									1						1				2	
6754	Pero hubneraria															1				1	
6797	**Ennomos magnaria**																		1	1	
6843	**Plagodis fervidaria**															1				1	
6982	**Procherodes transversata**			1												4			1	6	
7009	**Nematocampa limbata**					1	1													2	
7029	**Nemoria elfa**							1					4		1	30		1		37	cypress swamp community
7058	**Synchlora aerata**												1	1					2	3	
7132	**Pleuroprucha insulsaria**												1					4		5	
7136	**Cyclophora packardi**			1			2						2				1		2	8	
7146	**Haematopis grataria**					3	1												1	5	
7159	**Scopula limboundata**							1								1				2	
7169	**Scopula inductata**												1						6	7	
7196	**Eulithis diversilineata**												1							1	
7197	**Eulithis gracilineata**			1																1	
7390	**Xanthorhoe lacustrata**															1		2		3	
7414	**Orthonama obstipata**									1					6					7	
7416	**Orthonama centrostrigaria**			1																1	
7474	**Eupithecia miserulata**			2				1					3							5	
7647	**Heterophleps triguttaria**							1										1		2	
7663	**Apatelodes torrefacta**															1				1	
7716	**Anisota stigma**									2						3				5	
7775	**Manduca sexta**										1									1	tomato hornworm
7903	**Datana angusii**			4												2				6	
7907	**Datana integerimma**			1		2										2				5	
7915	**Nadata gibbosa**					1										1				2	
7931	**Gluphisia septentrionis**																	1		1	
7951	Symmerista albifrons																		1	1	
7985	**Heterocampa subrotata**															1				1	
8045.1	Crambidia pallida																	1		1	
8061	**Cisthene kentuckiensis**					1				1						1		1		4	
8067	**Cisthene plumbea**					5										5		40		50	
8089	**Hypoprepia miniata**																	1		1	
8090	**Hypoprepia fucosa**			2		10	1			1		33	2						3	52	
8098	Clemensia albata																	3		3	

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8107	**Haploa clymene**										1									1		
8118	Holomelina opella															1				1		
8137	**Spilosoma virginica**						1									1		1		3		
8169	**Apantesis phalerata**				4	1	1			1	1	3						1	5	17		
8196	**Grammia parthenice**					1														1		
8203	**Halysidota tessellaris**								1	1					5	1				8		
8230	**Cycnia tenera**								1	1										2		
8238	**Euchaetes egle**		2	2	4													1		9		
8267	**Cisseps fulvicollis**		1	2	6	3				1					2	1	3			19		
8314	Orgyia definita					2						9							3	14		
8322	**Idia americalis**																	2		2		
8338	Phalaenophana pyramusalis						1													1		
8351	Zanclognatha cruralis		1				1													2		
8364	Phalaenostola larentioides											1								1		
8366	**Tetanolita mynesalis**		1			6						1			1				1	10		
8370	Bleptina caradrinalis						1													1		
8385	Renia fraternalis						1													1		
8387	Renia sobrialis					1														1		
8393	**Lascoria ambigualis**					1														1		
8397	**Palthis angulalis**				1										1		1			3		
8398	**Palthis asopialis**		1		1	7			1	1		2			1		8	4		26		
8404	**Rivula propinqualis**					3									1					4		
8411	**Colobochyla interpuncta**		1				2		1											4		
8412	**Melanomma auricinctalis**																		6	6		
8440	**Nigetia formosalis**																3			3		
8441	**Bomolocha manalis**					1														1		
8442	**Bomolocha baltimoralis**					3						1			1		1	1		7		
8445	Bomolocha abalienalis					1														1		
8465	**Plathypena scabra**				2	2			1	2		1			1		18	5		32	swamp community	
8491	**Ledaea perditalis**													1		11		5		17		
8514	**Scolecocampa liburna**														1					1		
8528	**Hypsoropha hormos**				1															1		
8534	**Plusiodonta compressipalpis**					2						2					1	3		8		
8574	**Anticarsia gemmatalis**					1														1		
8719	Euparthenos nubilis						1													1		
8689	**Zale lunata**			2																2		
8727	**Parallelia bistriaris**					2						1								3		

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8729	Cutina distincta					1												3		4	cypress swamp commun.
8729.1	**Cutina n. sp. #1 (larger)**			4		1				6					1		2		6	19	cypress swamp commun.
8729.2	**Cutina n. sp. #2 (smaller)**			9		7				1						1		7	1	26	cypress feeder?
8738	**Caenurgina crassiuscula**						1						4						1	6	
8771	**Catocala piatrix**																		1	1	
8783	**Catocala angusi**												2							2	
8784	Catocala obscura												1						1	2	
8788	Catocala retecta																		1	1	
8801	Catocala ilia					1	1									1				3	
8834	**Catocala amatrix**												1						1	2	
8889	**Ctenoplusia oxygramma**																		1	1	
8890	**Pseudoplusia includens**												4						1	5	
8898	**Allagrapha aeria**						1												1	2	
8905	**Eosphoropteryx thyatyroides**																		1	1	
8908	**Autographa precationis**					1							4			2	1	1	1	4	
8924	**Anagrapha falcifera**					1	1									2	1			10	
8962	**Paectes abrostoloides**												1					1		1	
8990	**Nola cilicoides**					1														1	
8991	**Nola sorghiella**						1						1						3	5	
9044	**Thioptera nigrofimbria**					4						1						1		6	
9047	**Lithacodia muscosula**																		1	1	
9053	**Pseudeustrotia carneola**						2												2	4	
9056	**Homophoberia cristata**			1																1	
9057	**Homophoberia apicosa**																	1		1	
9070	**Amyna octo**												2						2	4	
9127	**Spragueia leo**					1	1									1				3	
9136	**Acontia aprica**					2										1				3	
9193	**Raphia frater**									2						1				3	
9200	Acronicta americana													1						1	
9219	Acronicta connecta																		2	2	
9286	**Harrisimemna trisignata**	1																		1	
9301	**Eudryas grata**			1																1	
9463	**Parapamea buffaloensis**																		1	1	feeds on lizard's tail
9523	**Bellura gortynoides**	1																		1	larva aquatic

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9647	**Athetis miranda**												3							3	
9666	Spodoptera frugiperda												1							1	pest: fall armyworm
9669	**Spodoptera ornithogalli**						1						7						9	17	pest: yellow-striped armywor
9684	**Elaphria grata**						3						4						5	12	
9688	**Galgula partita**							1											1	2	
9690	**Condica videns**						1													1	
9699	Condica sutor						2						4						1	7	
9720	**Ogdoconta cinereola**						2						2					1		5	
9725	**Stiriodes obtusa**			2		1										3		1		7	
9818	**Amolita fessa**							1								1				2	
10397	**Lacinipolia renigera**							1					1						1	3	
10438	**Pseudaletia unipuncta**			4						3						3				10	pest: armyworm
10456	Leucania adjuta					1	1						1						1	4	
10524	**Nephelodes minians**																		1	1	
10585	**Orthodes crenulata**										1		2						1	4	
10663	**Agrotis ipsilon**			2																2	pest: black cutworm
10664	**Agrotis subterranea**												1							1	
10670	**Feltia jaculifera**						1						8						3	12	
10911	**Anicla infecta**												1						2	3	
10915	**Peridroma saucia**												1							1	pest: variegated cutworm
10942	**Xestia dolosa**					1	1				1		1			3				4	
11006	Protolampra brunneicollis																		3	6	
11029	Abagrotis alternata																		1	1	
11068	**Helioverpa zea**						1						9						3	13	pest: corn earworm
11128	**Schinia arcigera**						2						3						1	6	
																		TOTAL:		1251	
	Number of species per site:						103						91						151		
	TOTAL SPECIES: 203																				
	TOTAL INDIVIDUALS: 1251																				