A SURVEY OF THE MOTHS, BUTTERFLIES, AND GRASSHOPPERS OF FOUR NATURE CONSERVANCY PRESERVES IN SOUTHEASTERN NORTH CAROLINA

Stephen P. Hall and Dale F. Schweitzer

November 15, 1993

ABSTRACT

Moths, butterflies, and grasshoppers were surveyed within four longleaf pine preserves owned by the North Carolina Nature Conservancy during the growing season of 1991 and 1992. Over 7,000 specimens (either collected or seen in the field) were identified, representing 512 different species and 28 families. Forty-one of these we consider to be distinctive of the two fire-maintained communities principally under investigation, the longleaf pine savannas and flatwoods. An additional 14 species we consider distinctive of the pocosins that occur in close association with the savannas and flatwoods. Twenty nine species appear to be rare enough to be included on the list of elements monitored by the North Carolina Natural Heritage Program (eight others in this category have been reported from one of these sites, the Green Swamp, but were not observed in this study). Two of the moths collected, *Spartiniphaga carterae* and *Agrotis buchholzi*, are currently candidates for federal listing as Threatened or Endangered species. Another species, *Hemipachnobia s. subporphyrea*, appears to be endemic to North Carolina and should also be considered for federal candidate status.

With few exceptions, even the species that seem to be most closely associated with savannas and flatwoods show few direct defenses against fire, the primary force responsible for maintaining these communities. Instead, the majority of these insects probably survive within this region due to their ability to rapidly re-colonize recently burned areas from small, well-dispersed refugia. The preserve with the largest number of distinctive as well as Natural Heritage Element species, the Lanier Quarry Savanna, is also the one that probably best retains the landscape features needed by this fauna: not only does it possess large areas of savannas, but these are divided into several patches by pocosins and other wetlands and each one has a somewhat unique fire history (they do not all burn at the same time!)

Attempts to restore savannas and flatwoods to their original condition through prescribed burning have proven highly successful where plants and vertebrates are concerned. For insects that follow the re-colonization strategy for survival, however, it can be potentially disastrous. The preserve with apparently the fewest number of distinctive species, the Green Swamp, has had large tracts of its savannas and flatwoods burned on a nearly annual basis since the 1930's, and most of these burns have been conducted in the winter -- the wrong time of the year for naturally-occurring fire. Even the relatively fire-suppressed flatwoods at the Angola Creek Preserve contained a higher number of species most characteristic of the longleaf pine communities.

The results of this survey can help refine the policy of prescribed burning on these preserves. For some species, such as the broad-winged sedge grasshopper (*Stethophyma celata*), recommendations are made as to what habitats should be spared from burning at certain critical times of the year. More generally, a pattern of burning that mimics the results at the Lanier Quarry Preserve is recommended: divide the preserve into multiple burn units; burn a third or less of the preserve during any one year; allow enough time for re-colonization to occur before burning adjacent units.

ACKNOWLEDGEMENTS

This study was funded primarily by matching grants obtained from the Small Grants Program of the Nongame and Endangered Wildlife Program of the North Carolina Wildlife Resources Commission and the Rodney Johnson Grant of The Nature Conservancy. Additional support was provided by the North Carolina Nature Conservancy and the North Carolina Natural Heritage Program.

We wish to thank a number of people for important contributions to this work. Margit Bucher, of the North Carolina Nature Conservancy, encouraged this project from the beginning as part of the Conservancy's effort to improve the beneficial effects of prescribed burning and minimize its adverse impacts. Margit, along with Alan Weakley of the NC Natural Heritage Program, also helped scout out the sites to be included in the survey. Other people that helped in the field were Harry LeGrand, of the NC Natural Heritage Program, and Bo Sullivan, of Beaufort, North Carolina.

Dave Baggett, Douglas Ferguson, Tim McCabe, Daniel Otte, and Dave Stephan all provided help in species determinations or graciously shared unpublished information concerning the ecological relationships and distributions of this little known fauna. Bo Sullivan, who has been studying the lepidoptera of the North Carolina Coastal Plain for over a decade, continues to steer us in our understanding of the lepidoptera of this region; access to his large collection has been of immense help. We also wish to thank Bob Blinn and Dave Stephan, of NC State University, and Ken Ahlstrom of the NC Department of Agriculture, for their help with the state's two large institutional collections.

Finally, we wish to thank several people who reviewed various parts of this report: Linda Pearsall, Alan Weakley, Mike Schafale, and Harry LeGrand, of the NC Natural Heritage Program; and Sam Pearsall and Margit Bucher, of the North Carolina Nature Conservancy.

CITATION

Hall, S.P.; Schweitzer, D.F. 1993. A survey of the moths, butterflies, and grasshoppers of four Nature Conservancy preserves in Southeastern North Carolina. Report to the Nature Conservancy, Durham, NC. North Carolina Natural Heritage Program, Raleigh, NC. 174 p.

Authors' Note, 19 February, 2021

The text has been reformated from the original but otherwise has not been significantly revised. The scientific names used in this document follow the nomenclature used in 1991 and are now different from the current versions. The following lists these changes for the species listed in Tables 3 and 4 as distinctive members of natural communities covered in this survey. The Global and State Ranks have also changed in several cases. Consult the NC Natural Heritage Program for the most recent statuses.

Old Name	**Current Name**
Butterflies	
Celastrina argiolus complex	*Celastrina idella*
Moths	
Doryodes n. sp.	*Doryodes bistrialis*
Euagrotis lubricans	*Anicla lubricans*
Hemipachnobia subporphyrea subporphyrea	*Hemipachnobia subporphyrea* (full species)
Morrisonia n. sp.	*Morrisonia triangula*
Spartiniphaga carterae	*Photedes carterae*
Grasshoppers	
Stethophyma celata	*Stethophyma celatum*

Introduction

Insects and other invertebrates deserve to be considered more often in the design and management of nature preserves. This is particularly true where the intention is to maintain viable and representative examples of entire ecosystems. In order for such an enterprise to succeed, it does not pay to ignore the most diverse group of all organisms; keystone elements in the food web, in pollination, and in other essential ecological relationships; some of the most sensitive indicators of environmental change; and many of the most distinctive and fascinating species present in any ecosystem.

More often than not, however, preserve managers do not have the information they need to make the best decisions regarding the invertebrate fauna. Lists of even the most common species, let alone the rarest or most characteristic of a particular site or region are typically unavailable. Crucial information on life histories and ecological relationships are even more fragmentary.

The temptation then is to center conservation decisions on the needs of the more visible and familiar members of the ecosystem, the vascular plants and vertebrates. "Management indicator" species[1], such as black bear, wild turkey, or white oak are frequently selected whose ecological needs can be relatively easily studied and which can plausibly stand in for the myriads of inhabitants whose identities are not even known. Management for such species is assumed to provide an "umbrella" of protection for species who are believed to require smaller areas of habitat, less habitat diversity, or habitat actually dependent on the presence of such "keystone indicator species" as the beaver.

This approach may work acceptably where the preserves are landscape in scale, such as the larger National Forests, Parks, and Wildlife Refuges, i.e., where management units are on the order of hundreds of square miles. In such preserves, either passive management can be employed, letting natural forces work more-or-less unfettered, or mistakes due to active management can be tolerated, since they will probably not effect the entire preserve. In such situations, management decisions informed by the needs of black bear or even white tailed deer may not necessarily be catastrophic for the entire ecosystem.

This luxury does not exist for small, isolated preserves, however. Here any mistakes in allowing Nature to take its course, or not to take its course, or in replacing natural ecological forces with artificial management practices can lead to significant loss of species. In today's fragmented landscape, such mistakes are likely to be irrevocable and the stakes become simply too high to rely on information supplied by just a narrow range of management indicators, all belonging to just a few taxonomic groups.

---

[1] We use this term in its most general sense, not just as defined by the US Forest Service, who are perhaps just the most explicit in basing management plans on "indicator species"; many others employ this technique without overt acknowledgment.

The situation is especially critical for ecosystems that require frequent disturbance to maintain their characteristic features. As will be discussed below, insects and probably the majority of small animals, typically follow a very different strategy for dealing with environmental change than do most plants, birds, or mammals. Measuring the success of a particular management practice, such as prescribed burning, by how well the hardwoods, game animals, or even rare species such as Cooley's meadowrue or red-cockaded woodpecker respond may therefore miss the disastrous consequences that may have occurred among the smaller fauna inhabiting the preserve.

Losses of this sort have been clearly documented in a number of studies conducted in the tall grass prairie ecosystem of the Midwest (see Opler, 1981; Panzer, 1988; Schweitzer, 1985, 1992; Dana, 1991; and Swengel, 1991). Although small prairie remnants often contain a surprising number of native plants, even after nearly a century of isolation, these same sites are often missing many of the most characteristic insects of the prairies. In order for some of these species to occur at all, such as the spectacular regal fritillary (*Speyeria idalia*), the prairie must not only be of high quality but also cover 100 acres or more (or at least be located near such a reserve -- Swengel, 1991; Schweitzer, 1992). Most crucially, it must also have had a history of disturbance that produced the same sort of spatial and temporal mosaic of recently and less recently disturbed patches as created by natural fires or grazing. Whereas prairie wildflowers and grasses may actually flourish where disturbances such as prescribed burning or mowing are more frequent and uniform than produced by natural forces, just the opposite is true for the prairie insects. As a result of habitat reduction and fragmentation, and particularly the drastic changes in disturbance regimes, several species of prairie insects are now candidates for the federal Endangered Species List, including most notably two species of lepidoptera, the Dakota skipper (*Hesperia dacotae*) and rattlesnake master borer (*Papaipema eryngii*)[2] (Schweitzer, 1989).

With these findings in mind, we attempted to assess whether the same situation exists in a set of habitats similar in many ways to the tall grass prairies, the longleaf pine savannas and flatwoods of the Southeastern Coastal Plain. Our main goal was to compile a basic list of both the common as well as the more distinctive species of moths, butterflies, and grasshoppers inhabiting four of the North Carolina Nature Conservancy's longleaf pine preserves. With this information, along with whatever life-history data we could obtain, we hoped to understand how past land use history may have affected this fauna, which species may be most vulnerable to management decisions or indecisions, and particularly what refinements can be made to current management practices in order to maximize the benefit to these groups and to their entire ecosystems.

---

[2] Other candidate species, such as the regal fritillary (*Speyeria idalia*) and Indiana flower moth (*Schinia indiana*), are also primarily prairie species but also occur in similar prairie-like habitats, such as glades.

The Longleaf Pine Ecosystem

As is true for the tall grass prairies, the open, fire-maintained pine savannas, flatwoods, and sandhills communities of the Southeast are among the most endangered in North America. From covering approximately 60% of the Coastal Plain from Virginia to Texas before settlement (Moore and Lynch, 1991), these communities now occur only as widely scattered remnants. Current estimates of their extent is placed at no more than 2 million acres, representing a loss of up to 98% over the past 200 to 400 years (Noss, 1989). Again as is true for the tall grass prairies, those tracts that have escaped conversion to agriculture, silviculture, or development have been drastically altered by loss of the key factor that maintained their characteristically open condition, frequent wildfires of vast extent.

Compounding the sheer loss of acreage, these coastal plain communities possessed (and still possess) some of the highest plant species diversities ever measured in North America. Belying their relatively simple structure and the poor soils typical of coastal plain uplands, the sunny conditions, warm humid climate, and habitat heterogeneity created by frequent fire all combine to produce herbaceous diversities of as much as 52 species per square meter (R. Peet, cited in Schafale and Weakley, 1990). Equally important from a biodiversity standpoint, many of these species are unique to this region, including most notably the Venus flytrap, but also numerous orchids, other wildflowers, and especially sedges and grasses.

The massive decline of these distinctive plant communities is becoming increasingly well-documented, as is the accompanying losses of certain vertebrates, particularly the red-cockaded woodpecker, Bachman's sparrow, gopher tortoise, gopher frog, and southeastern fox squirrel. In North Carolina, the greatest concentration of rare species monitored by the Natural Heritage Program occurs in the remnant savannas, flatwoods, and sandhills in the southeastern corner of the state. In terms of overall threats due to habitat loss, the Program has greater concerns for this region than even for the high mountains, where the number of narrow endemics -- both plant and animal -- is much higher.

Proportionately great losses may also be taking place among the invertebrates native to these communities, but without comparable attention. Although very little research has been conducted on the invertebrate fauna of the vanishing coastal plain savannas and flatwoods, there is no reason to suppose that the magnitude of their decline has been any less than in the fauna of the tall grass prairie. Not only are these two ecosystems similar in their dependence on frequent fire and consequent dominance by herbaceous species of plants, but they also have many species in common, including several insects, that suggests they were once linked biogeographically, probably during the Hypsithermal interval roughly 5,000 years ago. More importantly, the insect species, related or not, probably all share a similar strategies for coping with frequent fire and with environmental perturbations in general. This strategy makes these species particularly vulnerable to habitat reduction and especially fragmentation. Certain of these species may therefore be the most imperiled of all the organisms inhabiting the longleaf pine ecosystems of the Southeastern Coastal Plain.

Vulnerability of Insect Populations

There are a several key reasons why insects are among the most sensitive species to the effects of habitat alteration and fragmentation. The most obvious is that insects display an especially high degree of habitat specialization, a fact reflected in their enormous diversity. While this specialization is mainly an expression of the extreme differentiation of micro-niches possible because of their small body sizes, it has important implications at the macroscopic level: major losses of distinctive habitats, such as the savannas and flatwoods, are likely to have a more drastic effect on the diversity of their native insects than of either plant or vertebrate species.

A significant percentage of insects are monophagous or oligophagous, i.e., feeding on only one species of plant, vertebrate, or other insect, or on only a narrow range, usually species within just one genus or family. Herbivorous species are often restricted still further to feeding on only a particular phenological stage of their host plants, such as new growth that has not had time enough to develop tannins or other deterrents. Competition (although poorly understood in naturally occurring insect populations) may place further constraints on where and when a given species may be able to feed. Conversely, many related species can be found feeding simultaneously on the same narrow range of hosts, possibly the result of allopatric speciation followed by re-mixing of ranges (Sargent, 1976; Schweitzer, 1982).

Few, if any vertebrates show the same level of specialization. Most species occupy a wide range of habitats with only a few generalized requirements, such as for a particular habitat structure. While plants typically have more specialized needs -- for a particular soil type, moisture regime, insolation level, etc. -- the insects that feed on them are not only constrained indirectly by these same factors but have a number of additional constraints as well.

The most important of these is weather (Andrewartha and Birch, 1954). Inclement weather conditions such as drought or prolonged cold, wet conditions not only have direct effects on the survival of insects, but can interact with other factors, such as host plant constraints, in complicated ways. In the well-studied bay checkerspot (*Euphydryas editha bayensis*) and West Virginia white (*Pieris virginiensis*), a delay in hatching, larval development, mating or oviposition brought on by unfavorable weather may lead to missing the right phenology of the host plant or nectar sources. This, in turn, often results in widespread starvation of either the larvae or the adults (Singer, 1972; Cappuccino and Kareiva, 1985; Dobkin, et al., 1987). Small differences in microclimate available on different slopes or in swales versus ridges may make a great deal of difference in survival in this regard, particularly during extreme weather events.

Among many insects, particularly the more advanced orders possessing complete metamorphosis (the Holometabola), habitat constraints are compounded still further by larval and adult stages that occupy completely different ecological niches. In order for a habitat to be suitable for most species of butterflies, for instance, not only must the larval host plant be present but there must also be nectar sources for the adults (often provided by completely different taxa than the larval

hosts). The adults may also have a greater need for sources of minerals, amino acids, water, and basking sites, all of which may be localized in time and space (Gilbert and Singer, 1975).

All of these constraints indicate why insects are more sensitive to habitat alteration than vertebrates and particularly why monophagous or oligophagous insects are more restricted in their distribution than their host plants. But habitat restrictions are not the whole story to the vulnerability of insect populations. It is the coupling of narrow habitat requirements with the turnover of entire populations each year that make insect populations particularly prone to local extinction.

Insect numbers often fluctuate greatly from year to year, not only due to weather, but also to population cycles of their host plants or prey species, or of their own predators, parasites, and pathogens. When low population numbers coincide with catastrophic weather events such as hurricanes, prolonged drought or other major ecological perturbations such as fire, entire cohorts may be wiped out (Murphy, et al., 1990; Schweitzer, 1992). Unlike the majority of vertebrates or plants, which can weather bad years by surviving either as adults or dormant stages (seeds or spores), insects must successfully reproduce each breeding cycle if the population is to persist; loss of a single cohort is equivalent to extirpation of an entire population.

The Metapopulation Model and Fire-maintained Ecosystems.

For species that are habitat specialists, and thus usually patchy in their distribution, long-term survival within a region may depend on the existence of a metapopulation: a population of populations linked by inter-migration (Levins, 1970). If one population becomes extirpated in such a system, immigration from neighboring areas can recolonize the site, which in turn may become a source of immigrants for other areas as they become depleted. Although large reservoir populations may play an important role within this system (Ehrlich and Murphy, 1987), it is more the existence of the population network that explains the regional survival of the species rather than successful reproduction or survival of at least some individuals within any particular local population.

Although the existence of a metapopulational structure may be a significant factor in the regional persistence of vertebrates and plants that are habitat specialists and colonial in distribution, it is especially important for insects, which for reasons discussed above, have fewer defenses against local extirpation. Indeed, one of the most complete verifications of the metapopulation model has been accomplished by Paul Ehrlich, Dennis Murphy and their colleagues in studies on the bay checkerspot butterfly, an inhabitant of sparsely distributed serpentine grasslands in California (Ehrlich and Murphy, 1987; Harrison, et al., 1988; Murphy, et al., 1990).

The metapopulation model also appears to be particularly good at explaining the persistence of insects adapted to fire-maintained ecosystems, such as tall-grass prairies or the coastal plain savannas, flatwoods, and sandhills communities. At any particular site within a region swept by frequent fire, insects face an essentially no-win situation in terms of long-term survival. Either

the habitat succeeds to an entirely different form of vegetation if fire is too infrequent, or the population may be completely destroyed when fire does sweep through the area -- unlike the plants and vertebrates adapted to fire-maintained conditions, insects possess only a few means of escaping fire directly (at least in their larval, pupal, or egg stages).

On the other hand, their high rates of reproduction, possession of winged adults, and high ability to specialize on certain types of habitats make insects particularly adept at exploiting the constantly shifting environmental mosaic created by frequent fire. Given the existence of a widespread metapopulation, recently burned sites can be colonized as quickly as the vegetation reappears. Indeed certain species, such as the arogos skipper (*Atrytone arogos*), are found almost nowhere else but in the fresh growth of new grass that follows a fire (J.B. Sullivan, Schweitzer, pers. obs.). For insects such as this, the best adaptation to fire appears to be the colonizing abilities that are in fact the basis for all functioning metapopulations.

Effects of Fragmentation

This dependence on colonization, however, is the weak link in the metapopulational system. As vast tracts of landscape become converted from native habitats to man-altered systems, species that depend on colonization and re-colonization for regional persistence are faced with ever mounting barriers to dispersal. If the individual populations eventually become too widely separated, local extinction is no longer followed by restoration; the end result is quite easy to predict no matter how numerous the populations may have been initially.

Several insects have in fact become endangered apparently because of imposition of movement barriers and subsequent loss of metapopulational connections. Again, the best documented case is that of the bay checkerspot (Ehrlich and Murphy, 1987; Murphy and Weiss, 1988). This species is believed to have once been widespread within the native grasslands that occurred in the vicinity of San Francisco Bay. With the destruction and fragmentation of these communities by development and invasion by weedy exotics, the checkerspot's range has now been reduced to sparsely scattered serpentine outcrops, whose harsh edaphic conditions are too extreme for most generalist weeds. Although there were a number of such colonies as late as the 1950's, local extinction (together with continued habitat obliteration) has now reduced the range to a single small area where sufficient habitat patchiness and variability exist to sustain a viable metapopulation. Even there, drought and cool weather have temporarily reduced or even obliterated individual colonies; it is only due to the short dispersal distances between colony sites in this area that this butterfly maintains even this tenuous toehold on existence.

As is the case with the bay checkerspot, habitat specialization appears to be closely linked with fairly circumscribed dispersal abilities. Although a number of insects are famed for their long-distance migrations -- for example the monarch (*Danaus plexippus*), cloudless sulphur (*Phoebis sennae*), American locust (*Schistocerca americana*), and green darner (*Anax junius*) -- these species all have fairly generalized habitat requirements. In contrast, the bay checkerspot is extremely reluctant to cross even short spans of non-grassland habitats, even though it is

physically capable of doing so (Ehrlich, 1961). Still other species, such as Papaipema moths, move only short distances away from their natal host plant patches. Even within areas where their host plants are widely distributed, such species frequently occur only as small disjunct colonies (Schweitzer, 1985; Panzer, 1988).

Like the bay checkerspot, the regal fritillary, arogos skipper, several Papaipema moths, and other obligate prairie insects are all believed to have become endangered not only because of outright habitat loss and degradation, but also because the remaining populations on good quality habitat are simply too far apart to maintain the metapopulation structure necessary for long-term survival.

One other species that appears to be a good example in this regard, particularly with respect to the fire-maintained ecosystems of the Southeast, is the Saint Francis's satyr (*Neonympha mitchellii francisci*). This butterfly is known to occur only within a few square miles inside the Fort Bragg Military Reservation in the North Carolina Sandhills (Parshall and Kral, 1989; Hall, 1993). While this species appears to have a fairly stringent set of habitat requirements -- meadows or bogs containing abundant sedges -- it is likely that it once found suitable habitats throughout most of the sandhills, and possibly even the adjoining Piedmont and lower Coastal Plain. Habitat conversion undoubtedly played a great role in reducing the range of this species, but perhaps the greatest factors were the suppression of wildfires and the elimination of beavers over most of this area within the past century (Hall, 1993).

It seems no accident that the only place where this butterfly now remains is an area that still burns regularly and which thus supports a broad mosaic of open wetlands connected by grassy swales and other types of open habitat, exactly the conditions needed to sustain a constantly shifting metapopulation. Equally unsurprising, given the predictions of the metapopulation model regarding dispersal, other nearby pockets of suitable habitat are unoccupied where they are separated from the outposts of the metapopulation by thick tracts of fire-suppressed vegetation. As with the bay checkerspot, it seems almost certain that fragmentation of the regional landscape, local extinction, and low levels of dispersal have all combined to make Saint Francis's satyr one of the most endangered of all species in North America.

Implications for Conservation

The factors discussed above explain why insects (and other invertebrates) are often the most distinctive species inhabiting a given natural community and also among the most fragile. As mentioned at the outset, they should thus be major targets for preservation efforts, especially where the goal is to preserve examples of intact native ecosystems, particularly those that have suffered the greatest decline and which therefore usually contain the rarest species.

The complex life histories of insects, however, also make them quite challenging for conservation efforts. Preserve designs and management plans that have been traditionally drawn up with regard to the more straight-forward needs of vertebrates and plants may not be sufficient

to meet the needs of the insects indigenous to a community; in many cases they may actually work against insect preservation.

One of the most basic problems in insect conservation concerns how to maintain the metapopulation structure required by many of the most habitat restricted species. These are needs that extend beyond simply maintaining the presence of host plants and other resources. Given the long-term likelihood of local extinction, a preserve should ideally contain a large number of alternative colony sites with movement corridors in between. The preserve should also be large enough that not all colony sites will suffer the same extinction events -- Opler (1981) suggests 1000 acres as a minimum for prairie insects and Schweitzer and Rawinski (1988) estimate at least 2000 are needed for species found in the New Jersey Pine Barrens. It should likewise be diverse enough to support a variety of different micro-habitats, offering buffer capacity for yearly variations in weather and other stochastic environmental factors such as fire. In all these regards, the differing needs of the larvae, pupae, and adults must all be factored in.

Conserving Insects in Fire-Maintained Ecosystems

Insects that pose perhaps the greatest problems for preserve managers are those that inhabit chaparral, prairies, barrens, savannas, and other ecosystems where frequent fire is both natural and necessary for survival of these communities. As discussed above, sustaining a metapopulation structure is crucial for these species, since many fire-"adapted" insects have no real means of escaping fire directly but persist in the landscape only by constantly shifting around both to avoid the catastrophic effects of fire and to exploit its benefits.

For preserves isolated within regions where natural fire has long been suppressed, these problems become acute. Not only are outside sources of colonists effectively removed -- by habitat barriers if not outright loss of other colonies -- but the preserve itself may contain few options for within-site recolonization. A single fire sweeping the entire preserve, or the opposite, no fire for a long period of time, can both lead to permanent extirpation of significant elements of the insect fauna.

In this situation, there is almost no other recourse than some form of active intervention if fire-adapted communities are to be retained. This typically involves the use of prescribed burns. Unfortunately, there are several practical problems inherent in the controlled use of fire that stand in the way of duplicating the effects of natural fire. To name just a few: burns can take place only when permission is obtained from the US Forest Service (and with the surrounding landowners suitably informed); air quality conditions must be high enough to allow for the input of smoke; weather conditions must also be exactly right for controlling the direction, speed, and intensity of the burn as well as smoke output; a great deal of manual labor may necessary for constructing fire lines; and enough qualified personnel must be on hand to conduct the burn at a moment's notice when all other conditions are met.

Compared to natural, lightning-ignited fires that typically occur in association with rain and unpredictable winds -- both favoring cool, fast-moving, and patchy burns (Jennings, 1989) -- prescribed burning is most often done during the winter, when fires are most easily managed. The other difficulties mentioned above also favor burning entire preserves at one time, reducing the costs and difficulties associated with gathering together all the resources needed at one time. Single burn units also minimize the number of fire lines needed to control the fire.

While such burns may greatly benefit the vegetation of these communities, as well as highly mobile vertebrates such as quail, turkey, and red-cockaded woodpeckers (Robbins and Meyers, 1989), they may be completely inimical to the native insects of the preserve. While there is still some debate on how much damage prescribed burns have done to the rare insects inhabiting tall-grass prairie preserves in the Mid-west (Panzer, 1988), there appears to be unanimity that total burns have imperiled many of the most habitat-restricted species (Schweitzer, 1985; Panzer, 1988). For instance, one long-extant population of the regal fritillary is strongly suspected to have been destroyed by a single prescribed winter burn (Schweitzer, 1992) and another winter burn has been implicated in the loss from a Michigan preserve of a rare species of *Papaipema* (Schweitzer, pers. obs.). Many studies have also documented a severe reduction in insect numbers and diversity on burned portions of a preserve compared to unburned sections (see references in Schweitzer, 1985, and Panzer, 1988; Swengel, 1991). These reductions are reason for great concern where many species' ranges have been reduced to just these few small sanctuaries.

While more troublesome for the preserve manager, there are in fact a number of recommended means of reducing these impacts, including use of multiple burn units, avoiding burning more than a third of a preserve in any one year, and conducting burns on cool mornings and during the natural fire season. These will be brought up in more detail in the Discussion.

One additional principle that should be followed in all cases is to base management decisions on the best information obtainable. All too often, prescribed burning and other efforts to restore native vegetation have been given such a high priority that they have been carried out with little understanding of the possible impacts to other species, especially the rarely considered insects. The need to burn, however, is probably never so urgent that time cannot be taken to make at least at least targeted surveys for the most sensitive species suspected to occur in the habitats present; a more comprehensive inventory itself might only delay intervention efforts for a single year. If this investment can be made -- and we acknowledge that limitations on funding, manpower, and expertise may be substantial obstacles -- then the pay-off could be the discovery of a species such as Saint Francis's satyr, a true ecological jewel around which much of the preserve's conservation mission should be centered (e.g., see Stolzenburg, 1992). We hope such surveys will eventually become the rule, not the all too rare exception.

Status of Information Regarding the Insect Fauna of the North Carolina Coastal Plain

Saint Francis's satyr was in fact discovered only in 1983, and apparently by complete accident -- all populations of the other subspecies of Mitchell's satyr are found in completely different habitats and no closer than 500 miles to the north (Parshall and Kral, 1989). While this discovery may be seldom rivaled in the future, it is still indicative of how much work has yet to be done in describing the distributions of even the butterflies, the best known group of insects. Opler's county butterfly atlas (1983) supports this contention: many species recorded for North Carolina are represented only by one or two county records, particularly for those inhabiting the Coastal Plain.

Even less is known about the groups not as popular with collectors. Although the North Carolina State Museum of Natural Sciences has been compiling records of the state's insect fauna for nearly a century (Brimley, 1938; Wray, 1967), many species of moths, for example, are represented by only a few collections and there are a number of species not recorded at all whose ranges are known to embrace North Carolina.

The absence of basic distributional information is particularly pronounced with regard to the savanna and flatwoods communities of the Southeastern Coastal Plain. Despite the fact that these communities are some of the most unique within the eastern United States, they have received far less attention than the Southern Appalachians or Piedmont. With the one exception of the Rehn and Hebard expeditionary survey of southeastern orthoptera (Rehn and Hebard, 1916), which collected several undescribed species in the Wilmington area, no systematic inventory work has been done on the insects of these communities. Furthermore, what information there is may be sadly out of date: several of the most productive sites mentioned by Brimley and Wray no longer exist, including the Great Savanna at Burgaw and the pitcher plant bog at Spout Springs (Wells, 1967). Given the rapid disappearance of these communities, it would not be surprising if there were a number of species like Saint Francis's satyr that have nearly disappeared or completely vanished before they ever became known to science.

Goals of the Inventory

This survey of the insects of several longleaf pine preserves located in the southeastern Coastal Plain of North Carolina represents a cooperative effort by the NC Natural Heritage Program, NC Nature Conservancy, Eastern Regional Task Force of the Nature Conservancy, and the Nongame and Endangered Wildlife Program of the North Carolina Wildlife Resources Commission. As mentioned previously, it began as part of an effort to understand the impacts of prescribed burning on these ecosystems and to arrive at burn prescriptions that mimic the beneficial effects of natural fire as much as possible.

Given the largely unexplored nature of the insect fauna of these communities, the basic inventory became important in its own right, particularly since these communities are among the most imperiled in North America. The information produced by this survey should be of use not only

in arriving at comprehensive management plans for the existing preserves and directing further acquisitions, but also in serving as the starting point for further investigations of these communities throughout the entire Southeastern Coastal Plain.

There were thus several principal goals of this study:

1. Obtain as complete an inventory as possible of the moths, butterflies, and grasshoppers -- groups all believed to contain habitat-specialists associated with savanna and flatwoods communities.

2. Determine which species are the most distinctive members of these communities and which are the most imperiled, both on state and global levels.

3. Acquire as much life-history data as possible on the rarest elements in order to refine burn prescriptions and other management practices.

4. Compare the fauna present on recently burned areas with comparable unburned tracts in order to directly determine the impacts of fire and the time needed for recovery.

Methods

Insect Groups Surveyed

Most orders of insects probably have several species that are highly characteristic of, if not completely endemic to, the savannas and flatwoods of the Southeastern Coastal Plain. Based on surveys of tall-grass prairies, the following taxa appear to have many members strongly associated with open, grass- and forb-rich communities: grasshoppers and katydids (Orthoptera); butterflies and moths (Lepidoptera); and leafhoppers, froghoppers, and treehoppers (Homoptera) (Opler, 1981; Panzer, 1988; Panzer, 1991).

Our decision to study just two of these groups, the lepidoptera and grasshoppers, represents a compromise between the expectations of faunal significance and the limits of what we could collect, identify, and curate within the time available. The lepidoptera were chosen as the main focus for this investigation for a number of reasons:

1. Among all groups of animals, moths and butterflies are second only to beetles in numbers of species. In North America alone, over 11,000 species have been described (Hodges, et al., 1983).

2. Lepidoptera are particularly good indicators of habitat quality, since many species have some of the most specific habitat requirements of any animal. They also respond to habitat fragmentation, fire, and other disturbances at a scale that may have no overt effects on vertebrate populations but which may have serious impacts on other insects and invertebrates (Pyle, et al., 1981; Murphy and Wilcox, 1986).

3. The ecological relationships, distribution, and taxonomy of the lepidoptera are better characterized for the lepidoptera than most other groups of invertebrates. Checklists, field guides, and other reference manuals exist for both moths and butterflies (e.g., Howe, 1975; Miller and Brown, 1981; Hodges, et al., 1983; Covell, 1984; Opler and Krizec, 1984; Scott, 1986; Opler, 1992; Rings, et al., 1992).

4. Lepidoptera tend to be more easily inventoried than other groups of insects. Using only a relatively few techniques, an inventory of both representative and rare species can be obtained with an economy of effort.

5. Lepidoptera, particularly butterflies, are the most popular group of insects, both for collectors and the general public. This is what drives the intense interest in their taxonomy, life histories, and collecting methods. Because of this widespread interest, butterflies are considered the flagship group for the conservation of insects and their habitats, i.e, carrying the load for a group of organisms otherwise often maligned (New, 1991).

The features listed above apply particularly to the macrolepidoptera, which is the group we investigated in detail. This quasi-taxonomic category includes eight closely related superfamilies in the suborder Ditrysia: the Papilionoidea and Hesperiodea (butterflies and skippers); and the Drepanoidea, Geometroidea, Mimallonoidea, Bombycoidea, Sphingoidea, and Noctuoidea (collectively termed the macro-moths). Not only does this group contain the majority of species within the lepidoptera (5790/11233 = 52% of North American species -- Hodges, et al., 1983), but it also comprises nearly all of the larger species and better known groups, including the butterflies, skippers, giant silkworm moths, sphinx moths, inchworm moths, and owlet moths. Only members of a few other families of lepidoptera recorded, primarily the Psychidae, Cossidae, Megalopygidae, Limacodidae, and Pyralidae, all of which possess species as large as many of the "macros".

The other group of insects we studied, the grasshoppers, was selected partly because they are important constituents of grassland communities, and partly because they can be surveyed at the same time and by much the same methods as the butterflies. Although this group contains few species that are monophagous or oligophagous -- most feed on a wide range of grasses and sedges -- several are nonetheless quite habitat specific, including some that appear to be strongly restricted to the coastal plain communities of the Southeast (Rehn and Hebard, 1916). As is true for the lepidoptera, the taxonomy and natural history of grasshoppers has been fairly-well studied (e.g., Rehn and Hebard, 1916; Blatchley, 1920; Helfer, 1987; Otte, 1981, 1984).

Sampling Methods and Equipment

Nocturnal Sampling.

We made use of several standard methods to sample moths. For the most intensive sampling, we relied on UV bucket traps, which can operate all night long without attendance and can be used in nearly any kind of weather. This type of trap makes use of the luring property of light, which probably works by disrupting nocturnal insects' normal navigation by means of the moon and stars (see Sargent, 1976, and Butler and Kondo, 1991, for a review of this technique).

The trap design we employed uses a 15 watt ultraviolet florescent light powered by a 12 volt battery (see Figure 1). The bulb is suspended between four clear panes of plexiglass, which serve to knock down flying moths into a funnel hung below. The funnel in turn opens into a plastic bucket filled with the lethal fumes of ethyl acetate. Depending on the weight of the batteries (we used deep cycle marine batteries for the most part, but gained more portability in 1992 by acquiring a light-weight gel-cel battery), this trap is quite transportable, unlike those that use a mercury vapor lamp which must be powered by a portable generator. It is also fairly weather-proof. The cool operating temperatures of florescent lights prevent them from cracking even during a downpour. The inside of the bucket is kept from filling up by means of a smaller basin hung just below the funnel that traps the rain and diverts it out of the trap through a small tube.

Although this type of trap collects a wide variety of moths and other nocturnal insects, some species escape the funnel more readily or are less likely to be knocked down by the panes. Some of these can be found hanging from the trap or in nearby vegetation when the trap is collected in the morning.

A more effective means for sampling this group is the standard sheet sampling technique. In this method, a UV light is simply hung in front of a white sheet suspended between two trees; moths are collected individually by the investigator. We used this method on an occasional basis to supplement the samples obtained from the bucket traps. Since the collector must remain in attendance in order to capture the specimens, it has obvious drawbacks, particularly in pouring rain and early in the morning when several species just begin to become active.

These drawbacks also apply to the traditional method of baiting. Many moths, as well as other animals, are quite attracted to a mixture of beer, molasses, fermenting fruit, and brown sugar. Some groups, such as the underwing moths (*Catocala* spp.) and zales (*Zale* spp.), are often found in abundance using this technique while traps placed in the same habitat obtain relatively few specimens. As with the sheet samples, we used this method to supplement the trap samples, but used it just at the Green Swamp and Angola Creek Flatwoods.

Diurnal Sampling

Butterflies and grasshoppers, as well as a few species of day-flying moths (e.g., *Utetheisa bella* and *Argyrostrotis* spp.), were sampled by means of direct search and the use of a standard insect net or heavy-duty sweep net. An effort was made to walk all parts of a site, but particular emphasis was given to searching flower patches, especially for the lepidoptera. Site specific searches were also employed in hunting certain species of grasshoppers (e.g., *Stethophyma celata* and *Melanoplus decorus*).

Due to time constraints imposed by the need to pack the large quantities of moth specimens, less time was spent searching the preserves for butterflies and grasshoppers than we had intended. The available time was further reduced by thunderstorms, which lasted most of the day on several of the trips made in 1991. For these reasons, as well as the qualitative nature of this sampling method, only a few very general comparisons can be made between the different sample sites and trips.

Identification and Curation.

Moths were identified primarily by Schweitzer[3]. Some of the rarer specimens have been deposited in the Smithsonian, while the majority will be ultimately donated to the NC State University Collection of Insects.

Butterflies and grasshoppers were identified by Hall. Only a few voucher specimens of butterflies were collected, all skippers. The number of good fields guides available made field determination easy for most species encountered, even at a distance.

A more complete collection of voucher specimens was kept for grasshoppers. Keys in Otte (1979, 1981), Helfer (1987), and Blatchley (1920), as well as descriptions given in Rehn and Hebard (1916), were all consulted for in the identification of this group. The reference collections at NC State University and the NC Department of Agriculture were also frequently consulted.

Sites and Communities

Four Nature Conservancy preserves were chosen for surveying: the Green Swamp Preserve, Myrtle Head Savanna, Lanier Quarry Savanna, and the Angola Creek Flatwoods (see Figure 2). All four are located in the Outer Coastal Plain Physiographic Province and are situated within 20 miles of the coast. Collectively they include some of the best remaining examples of the three most characteristic natural communities of this region: wet savannas, flatwoods, and pocosins.

Sampling stations were chosen within the preserves primarily to obtain a good balance between the savanna and flatwoods communities. Other comparisons were made as opportunities arose: between the burned and unburned portions of the Myrtle Head Savanna and between a typical flatwoods site and a sand ridge within the Angola Creek preserve.

Green Swamp

This is probably the best known area of savannas, flatwoods, and pocosins occurring in southeastern North Carolina Coastal Plain (the actual swamp habitats are relatively confined). Due to the large number of unusual species it harbors, it has long been a favored collecting site for both botanists and lepidopterists.

The Green Swamp historically extended over about 200,000 acres (Roe, 1987), including much of the territory south of Lake Waccamaw to the coast. Today, however, the majority of its vast

[3] A few problematic species of geometrids were determined by Douglas Ferguson of the US National Museum. Help with the identification of the species of *Gabara* was obtained from Tim McCabe of the New York State Museum, Albany. J.B. Sullivan of Beaufort, NC determined the specimens we obtained jointly from Lanier Quarry on the September sampling trip in 1992.

extent is managed for timber production and has been drastically altered by drainage ditches, planting in slash pine and loblolly, clear-cutting, fire-suppression, and possibly by too frequently (annually) conducted winter burns. Nonetheless, some of the most significant portions have remained nearly intact, at least botanically. Since 1977, 15,72200 acres have been protected by the North Carolina Nature Conservancy through a series of donations by the Federal Paper Board Company.

Most of the Nature Conservancy preserve is covered with nearly impenetrable pocosins, but several slightly more elevated and better-drained "islands" of savannas and flatwoods are also included, comprising about 400 acres of open, park-like habitat. These were the focus of the sampling efforts within this preserve although pocosin species were also frequently collected.

The most intensively sampled site, at least for moths, was Shoestring Island (see Figure 3). Although this site has often been called a savanna and possesses an open canopy of longleaf pines, most of this site is covered with a mixture of wiregrass (*Aristida stricta*), bracken (*Pteridium aquilinum*), and low shrubs more typical of the wet pine flatwoods community (Schafale and Weakley, 1990). Patches of the highly diverse herbaceous communities characteristic of true pine savannas (including such typical species as Venus flytraps, *Dionaea muscipula*, and other carnivorous plants) are restricted mainly to the wetter areas along the edges and ends of this area. Although the conditions distinguishing these two types of communities are still unclear, wet pine flatwoods tend to occur on sandier, and therefore slightly better drained sites than the wet savannas. They also may be burned less frequently, favoring the growth of low shrubs such as *Vaccinium crassifolium*, *Ilex glabra*, and *Gaylussacia* spp. One particularly noteworthy species present at Shoestring and strongly associated with flatwoods rather than savannas is pixie moss (*Pyxidanthera barbulata*).

The trapping station at Shoestring was, in fact, initially chosen for its proximity to a patch of pixie moss; one of our target species was the rare moth, *Agrotis buchholzi*, whose larvae is monophagous on this species. Apart from this one bias, however, the habitat at the trap site was typical of Shoestring Island as a whole, including its location next to a pocosin. The mixture of flatwoods and pocosin species characteristic of this site was also obtained in the moths collected from a bait trail which ran through the center of a pocosin (via a boardwalk) before crossing out into the open flatwoods.

In addition to Shoestring Island, several wet savannas were sampled elsewhere in the Green Swamp Preserve, particularly for butterflies and grasshoppers in both years of the survey and for moths in 1992. These include the Big Island, Little Island, and Calf Island Savannas, all of which are located adjacent to NC 211 (see Figure 3). These sites differ from Shoestring Island in their possession of a much richer assemblage of herbaceous species and a correspondingly lesser amount of low shrubs. These features may be due to the generally wetter conditions at these sites, which are possibly favored by a finer textured soil, or because they have been more frequently burned historically.

The fire history of the Green Swamp is actually quite well documented (NC Nature Conservancy records). Several large wildfires are known to have swept over extensive areas of the preserve since 1932, the last occurring in 1982 as the result of an accident. Beginning around 1937, prescribed burns have also been regularly conducted on several of the "islands" in order to maintain them as fire breaks. This is particularly true for the roadside savannas located along NC 211. With only a few exceptions, the Big and Little Island Savannas have been burned annually since World War II.

Since the preserve was created in 1977, prescribed burns have continued on a nearly annual basis on the roadside savannas. As mentioned above, this one factor alone perhaps accounts for relative lack of shrubs on these sites and their corresponding high density and diversity of herbs. On the other hand, Shoestring Island has also been burned essentially annually since 1977, although only sporadically before that time.

With the exception of the Big Island Savanna, none of the sites at Green Swamp were burned during the period covered by this survey. Big Island Savanna was burned in 1991 just before the survey began in April, and again in February, 1992.

Myrtle Head Savanna

The other preserve surveyed in Brunswick County, Myrtle Head Savanna, is also located on the historic fringe of the Green Swamp (see Figure 2). Extensive tracts of savannas persisted in this area until just the last decade, when most were clearcut. Although some of these areas contain remnants of native herbaceous ground cover (Alan Weakley, pers. comm.), which may still act as refugia for at least some of the savanna insect species, the increasing practice of disking and mounding the soil in preparation for planting rows of pine is now removing even these last vestiges.

Myrtle Head Savanna is separated from the Green Swamp Preserve by approximately 12 miles of nearly monotonous timber company lands. Agricultural fields and a small residential area also occur within a two mile radius of this site, unlike the situation at the Green Swamp Preserve, which is located several miles from the nearest cultivated or inhabited area.

Although small compared to the Green Swamp Preserve -- covering only about 70 acres -- most of this site consists of wet savanna habitat rather than pocosin. It is, in fact, one of the richest known examples of this type of community (Weakley and Moore, 1989). In addition to the more typical savanna species, such as Venus flytrap and pitcher plants, the Myrtle Head Savanna contains by far the biggest of the thirteen known populations of Cooley's meadowrue (*Thalictrum cooleyi*), which is federally listed as Endangered. Also found on this site are several other extremely rare species, including wireleaf dropseed (*Sporobolus teretifolius*), Carolina grass-of-Parnassus (*Parnassia caroliniana*), and pineland plantain (*Plantago sparsiflora*). These four species occur almost exclusively on savannas underlain by marl, which in fact lies close below the surface at Myrtle Head. The rich, limey conditions present in this area also account for an

unusual juxtaposition of pond cypress (*Taxodium ascendens*) and tuliptree (*Liriodendron tulipifera*), which occur along some of the wetter drains that penetrate into the savanna from the surrounding swamp.

This site had long been owned by a timber company prior to its acquisition by the Nature Conservancy. Just before the discovery of its significance as a natural area in 1989 (Weakley and Moore, 1989), the entire site had actually been timbered although not site-prepped. This accounts for its lack of a mature canopy; young longleaf pines and pond cypress are scattered throughout, but the nearest mature trees are located in a remnant fringe of swamp forest that borders the preserve on most of three sides (the east side is bordered by a recent clearcut).

Unlike most timber lands, this site has had a long history of burning, although most of it undocumented (and apparently done without the knowledge of the landowner). Prior to TNC acquisition in 1989, this site had been used for approximately thirty years as a cow pasture and burned perhaps annually in order to create fresh grass for the cows to graze (Weakley and Moore, 1989).

Before the start of this investigation, however, the site had not been burned for approximately five to eight years, allowing shrubs to encroach into the savanna in many areas. Species such as titi (*Cyrilla racemosa*), hollies (*Ilex* spp.), sweetbay (*Magnolia virginiana*), swamp redbay (*Persea palustris*), and fetterbush (*Lyonia lucida*) were all common throughout the preserve by the time the study began in 1991. Some of the wetter areas also supported small stands of swamp forest trees, including red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and the aforementioned pond cypress and tuliptree.

Out of concern that the Cooley's meadowrue and the other rare forbs and graminoids were becoming shaded out by the invading shrubs, the southern half of the preserve was burned in June, 1991, including the site where we had sampled moths during the previous two months. Following this burn, we decided to continue sampling at this site but to also establish a second trapping station on the unburned side for comparison (see Figure 4). From June through October in 1991, and in May, June, and September in 1992, traps were run each sampling trip at both trap stations.

Lanier Quarry Savanna

Many of the unusual botanical features that distinguish the Myrtle Head Savanna are also prominent at the Lanier Quarry Preserve, although the sites are located approximately 60 miles apart. Marl occurs close to the surface in several parts of this preserve and both active and abandoned limestone quarries exist on adjoining areas. As at Myrtle Head, the high Ph of the soils at this site support one of the richest assemblages of herbaceous species found in the Southeast. Cooley's meadowrue, Carolina grass-of-parnassus, and pineland plantain again occur at the Lanier Quarry Savanna and the two preserves also share a number of other rare species not

known to occur elsewhere in the state. These include a new species of onion (*Allium* n. sp.), several sedges (*Carex* spp.), and beakrushes (*Rhynchospora* spp.).

The rich, marl savannas occupy only a small part of this area, however (see Figure 5). Most of the savanna, which extends over more than 200 acres, occurs on the sandy, nutrient-poor soils more typical of the region. *Sporobolus* sp. 1 and other wetland grasses dominate the herb layer in this part of the savanna, which also includes the usual assemblage of carnivorous plants (including Venus flytraps), orchids and other wildflowers. One rare grass species that occurs in scattered patches over most of the savanna is pinebarrens sandreed (*Calamovilfa brevipilis*), the host plant (Schweitzer, unpubl.) of the rare moth, *Spartiniphaga carterae* Schweitzer.

Mature longleaf pines are sparsely scattered over most of the savanna, although pond pine (*Pinus serotina*) is dominant on a large portion of the marly area. Swamp forest borders the savanna on three sides, and penetrates into the preserve along several narrow drains. In addition to these natural communities, several old fields and successional tracts of mixed pines and hardwoods also adjoin the preserve. The north boundary of the savanna is formed by a small residential area located along a paved road.

The fire history of this site appears to be similar to that of the Green Swamp and Myrtle Head Savanna, although it is less well documented. The landowners burned the savanna frequently in order to keep the habitat suitable for Venus flytraps, which they harvested and sold to commercial nurseries (Rome, 1987). Following TNC acquisition of the core area of the savanna, a prescribed burn was conducted on approximately 30 acres in 1987, but not again until after this survey had been nearly completed. Consequently shrubs had begun to invade the preserve by 1991, although not to the same extent as at Myrtle Head. The small Front Savanna was burned in 1992, as was part of the larger Big Savanna (the northern section known as the "Super Savanna"). The remaining portion of the Big Savanna was burned early in 1993.

Although the rich, marly portion of the preserve was sampled regularly for butterflies and grasshoppers, the moth trapping station used throughout 1991 was situated at the edge of the Big Savanna, primarily because its remote location was less likely to invite vandalism (the marly areas are unfortunately all located close to the residential area). This site was fairly typical of the savanna as a whole, although located close to a narrow strip containing wetland shrubs, ferns, and mats of sphagnum. In September 1992, two additional sites were sampled in addition to the usual site: the rich Front Savanna and an old field near the quarry that contained an abundant display of fall wildflowers.

Angola Creek Flatwoods

The second preserve surveyed in Pender County, the Angola Creek Flatwoods, is located approximately six miles to the northwest of Lanier Quarry. Compared to the other three preserves, Angola Creek is most similar to Shoestring Island in the Green Swamp in that most of its 250 acres is covered with the combination of wiregrass, bracken, and low shrubs that grow on

somewhat better drained, sandier soils than occupied by true savannas. Pixie moss (*Pyxidanthera barbulata*) is also present at this site, but only a few small remnants exist of the rich pine savanna vegetation, including a small amount of Venus flytrap and other carnivorous plants confined to a few ditches.

Although it possesses far fewer rare plant species than the other three areas, it also contains a somewhat greater topographic relief and a correspondingly greater structural diversity in its plant communities (this is also attributable to fire suppression). In addition to the flatwoods community, pocosins and canebrakes penetrate throughout the preserve, dividing it up more thoroughly than they do at Shoestring Island. In the center of the preserve there is also a low sand ridge that supports stands of turkey oak (*Quercus laevis*) and other xerophytic species. The juxtaposition of these xeric and mesic communities further creates a diverse variety of ecotones, which themselves contain species not found in the more dominant communities. A recent clearcut borders the site to the east that still supports wildflowers and a perhaps a few of the native flatwoods species; young pine plantations and old fields occur on other adjoining lands.

Angola Creek is by far the most fire-suppressed of the four preserves. The canopy is more closed here than at the other sites, although it is still dominated by longleaf pines and is open enough to support a colony of red-cockaded woodpeckers. The only recent fires known to have occurred at this site were light, winter burns started by a local hunter to provide fresh forage for deer and other game species. TNC has not carried out any prescribed burning since the preserve was acquired in 1989 but has an agreement with the hunter for him to continue to burn the preserve in return for continued hunting access. Parts of the preserve were burned in the late winter, 1991, approximately two months before the beginning of this survey.

Two trapping stations were used at Angola Creek (see Figure 6). The first site was fairly representative of the flatwoods and pocosin-edge communities but was also located close to the edge of a large clearcut. The selection of this site was based partly on its proximity to a large patch of pixie moss, as was also the case at Shoestring Island. Beginning in June, 1991, we established a second trapping station located more in the center of the preserve's natural communities. This site was also situated in the middle of the sand ridge community, allowing for comparisons to be made to the flatwoods fauna. A bait trail was employed at this site, as at Shoestring Savanna, and extended along an old logging road that ran between the two trapping stations.

Sampling Schedule

The four preserves were sampled once a month from April to October, 1991; the dates, weather, and other conditions are given in Appendix C. The timing of the trips was determined primarily by the phase of the moon: moth trapping has been shown to be most productive when the moon is dark. Visits were arranged as much as possible to occur during the interval between the last and first quarters of the moon.

Weather and other scheduling conflicts influenced the dates of the surveys to some extent, most significantly with regard to winter sampling. Although we had intended to do at least one or two winter trips, primarily to sample for several groups of winter flying moths (primarily members of the Noctuid subfamily Cucullinae), we were unable to match work schedules with windows of opportunity provided by the weather. Our overall sample is admittedly deficient for this reason.

The August visit was also disappointing in several respects. A new gate recently installed at Shoestring prevented access to the usual trapping station and Big Island Savanna was sampled in its place. Much more disastrously , the raincatcher in the trap was knocked loose and failed to operate during the heavy downpour that occurred the night of this sample. In an attempt to dry out the resulting moth soup, the contents of this trap became accidentally mixed with the samples from Myrtle Head Savanna and Angola Creek, which were also slightly wet. Although the data provided by this scrambled sample could still be used to determine species representation for this month, the mix-up unfortunately prevented our comparison of the burned and unburned sides of Myrtle Head Savanna at what appears to have been a particularly important stage (no significant new species were obtained in this month's sample, however).

The trips made in May, June, and September, 1992 served primarily to continue the comparison of the burned and unburned portions of Myrtle Head Savanna and to augment the species list for the Green Swamp. Lanier Quarry was also intensively trapped for moths during the September trip, primarily in an attempt to obtain better representation of flower moths (*Schinia* spp.), whose peak flight period may have occurred between sample visits the preceding year.

Again there was one unfortunate departure from the normal routine during the 1992 visits: the battery powering the trap at Big Island was stolen during the September sampling visit, probably after only a few hours of operation, judging by the small number of moths found in the trap -- one of which was a *Schinia* which we hadn't captured in the previous year.

Results

Taxonomic Summary

A total of 512 different[4] species were identified during the course of this survey. A complete list of species and collection records is presented in Appendix A and Table 1 summarizes the results for the macro-lepidoptera and grasshoppers.

Although no species of grasshoppers or butterflies were discovered that had been previously overlooked in North Carolina, 120 species of the macro-moths we collected were not listed for the state by Brimley (1938) or Wray (1967), the only compilations that have been made of the insect fauna of North Carolina. Many of these species probably do not represent new state records, however. North Carolina collections are mentioned for several of these species in various fascicles of the Moths of North America or in other scientific journal articles. Others are well known to include North Carolina within their range even though no specimens may have been collected within the state itself. A full assessment of the status of these species will require a thorough search of the literature as well as checking through several institutional and private collections.

At least one group of moths could not have been included on Brimley's or Wray's checklists since they were not described until after 1967. These include five species that were not even included in the Hodges checklist (Hodges, et al., 1983): *Macrochilo hypocritalis* (Ferguson, 1982), *Spartiniphaga carterae* (Schweitzer, 1984), *Apantesis carlotta* (Ferguson, 1985), *Acronicta sinescripta* (Ferguson, 1987), and *Nematocampa baggettaria* (Ferguson, 1993). Still others have yet to be described, including new species of *Doryodes*, *Morrisonia*, *Ablemma*, and *Zale*. One or more undescribed species may also occur among the taxa we could only list as species complexes, including the *Crambidia pallida* complex and *Elaphria festivoides* complex. In the case of *Crambidia* in particular, we believe several undescribed species are represented in our samples.

Ecological Composition

More important than the taxonomic analysis of the results, at least for the purposes of this investigation, are the ecological associations and distributions represented by the species. Appendix B presents an effort to divide the macro-moths, butterflies, and grasshoppers into eleven habitat/range groupings based on previously known information about range, host plants, and habitat preferences.

We acknowledge that a great deal of this information must be interpreted with caution, since there are still major gaps in the understanding of insect ecology and biogeography, particularly

[4] This total includes a number of species that were not fully identified; these species were not included in calculating the total if there was any possibility that they were the same as other species already included.

for moths. Published accounts of larval host plants need to be interpreted with particular skepticism, since they are frequently based on efforts to rear larvae in captivity from eggs laid by captured females rather than on direct observations of the larvae feeding in the wild (see McCabe, 1991, and Rings, et al., 1992, for a discussion of these problems). In several cases the only host plants known for a species are not found in southeastern North Carolina and in some instances nowhere in the entire state.

Table 2 summarizes these divisions. Only 9% of the macro-moths are so poorly known that they could not be assigned to even the broad categories used here and no grasshoppers or butterflies fall into this group of unknowns. The vast majority of the species actually appear to be quite common and occur in most of the widespread habitats in the eastern United States. Even though there are uncertainties regarding the life-histories of many of these species, it is probably safe to conclude that the species falling into categories 1 through 5 in Table 2 are not the most characteristic members of the Southeastern Coastal Plain habitats investigated in this survey. This group includes 80% of the macro-moths, 70% of the butterflies, and 65% of the grasshoppers collected during the study.

The remainder occur in habitats that are at least typical of the Coastal Plain, although neither these species nor their habitats are necessarily restricted to this province. The pine sphinx (*Lapara coniferarum*), for example, is certainly a good member of the longleaf pine communities of the Southeast -- it was first described from a painting by John Abbot of an adult reared from a larvae taken from longleaf pine. Like many of the species in the group of pine and conifer feeders, however, the pine sphinx also occurs throughout much of the eastern United States, where it feeds on a number of different species of pines (including the widely planted loblolly).

Distinctive Species

In order to obtain a list of the species most restricted to the communities investigated in this survey, further attention was given to the known ecological relationships and distributions of the species falling into categories 6 - 10 presented in Table 2. Species such as the pine sphinx were excluded from further consideration based on their wide occurrence in eastern forests. On the other hand, species such as Buchholz's zale (*Zale buchholzi*), another pine-feeding moth, were included in this more exclusive list based on their restricted occurrence to the Southeastern Coastal Plain (by which we mean the coastal plain areas of the Carolinas, Georgia, and Florida; we also include as an outlier the Pine Barrens of New Jersey, although not the Delmarva Peninsula, based on habitat affinities). In other cases, such as the pitcher plant borer moth (*Papaipema appassionata*), species were included that have a fairly extensive geographic range in the East but which are highly restricted to habitats similar to the savannas, flatwoods, and pocosins of the Southeastern Coastal Plain.

Table 3 presents the results of this winnowing. This list of 42 species of macro-moths, 9 species of butterflies, and 8 species of grasshoppers represents our best guess as to which species are the most distinctive members of the investigated communities. The community assignments

presented in this table represent an oversimplification, however, since several of the species actually inhabit more than one of the communities. Certain species, moreover, are probably more characteristic of the ecotones between pocosins and the more open savannas or flatwoods than they are of the separate communities themselves. Given the close proximity or intergradation of the savannas, flatwoods, and pocosins, it is probably more accurate to view the species in Table 3 as representative of the entire suite of fire-maintained communities in the outer Coastal Plain of North Carolina. The figures given in parentheses in Table 2 represent the number of these species present in each of the preserves.

Natural Heritage Program Element Species

Many, though not all, of the species included in Table 3 are uncommon to rare, probably in reflection of the rarity of their habitats. Certain of these species are known, in fact, from only a few specimens. The Venus flytrap cutworm (*Hemipachnobia s. subporphyria*), for example, was previously known primarily from a painting by John Abbot dating back to the early 1800's. Another species, Buchholz's cutworm (*Agrotis buchholzi*), was formerly only known from specimens collected within a limited area of the New Jersey Pine Barrens, and the broad-winged sedge grasshopper (*Stethophyma celata*) was known along the Atlantic Seaboard from only six widely disjunct sites and may not have been seen anywhere since the 1940's (D. Otte, pers. com.).

Table 4 presents the list of the species collected in this survey that we believe are particularly rare, either within North Carolina or globally. In addition to the species we recorded, this list also includes seven species of butterflies reported from the Green Swamp by other collectors. Status and rarity ranks follow conventions established by the network of Natural Heritage Programs and The Nature Conservancy. Species with state status of Significantly Rare are elements actively tracked by the NC Natural Heritage Program; 29 species were added as elements as the result of this survey (all the moths and grasshoppers included in this table).

With the exception of three moths, these species all appear to be representatives of savanna, flatwoods, and pocosin communities. More than any other species collected in this survey, this group should be given careful consideration in preserve design and management, particularly with regard to prescribed burning. The next section presents a summary of what is known about the distribution and ecology of these species.

MACRO-MOTHS

Acronicta lanceolaria and A. sinescripta. These two closely related species belong to a large genus of moths that occur primarily in forested habitats. The larvae of the majority of these species feed on hardwood trees and shrubs, although a few, including *lanceolaria* and another closely related species, *oblinata*, are known to feed on lower-growing plants, herbaceous as well as woody species.

Acronicta lanceolaria is the better known of these two moths, although it is rarely collected. While it appears to have fairly narrow habitat requirements -- it occurs primarily in pitch pine lowlands in New Jersey and in acidic wet meadows and scrub oak-heath barrens further north -- its rarity may also be explained by its avoidance of traps or bait (Schweitzer, pers. obs.; larvae are much more often seen than adults). Our one specimen, in fact, was captured while it was still expanding its wings following eclosure.

This species appears to be primarily northern in its distribution; the main part of its range extends from Maine to Manitoba and south to New Jersey (Forbes, 1954; Schweitzer, pers. obs.). Populations have been discovered, however, as far south as Florida (Kimball, 1965; Profant, 1989; Minno, 1992), and J.B. Sullivan has collected a few from his trapping stations on the outskirts of the Croatan National Forest in North Carolina (Sullivan, pers. comm.). On the other hand, it was not recorded in the state by either Brimley (1937) or Wray (1967) and no specimens exist at either the collection at the NC Museum of Natural Sciences or at NC State University.

Acronicta sinescripta is a recently described species currently known only from the Southeast (Ferguson, 1987). Apart from specimens collected in North Carolina near the Croatan National Forest by J.B. Sullivan (pers. comm.), this species had previously been recorded only from coastal South Carolina to Florida and westward along the Gulf Coast to Louisiana (Ferguson, 1987). Given our records and Dr. Sullivan's, North Carolina now appears to be its northern limit.

Nothing is known concerning its larval host plants and habitat preferences. It has also been recorded from a number of disparate-seeming habitats, including the complex of tidewater forests and marshes at the Wedge Plantation, South Carolina, the wet grasslands at Payne's Prairie in Gainesville, Florida, and the mixture of sandhills scrub and flatwood communities present at the Archbold Biological Station in Florida. Our three specimens were collected from Myrtle Head Savanna and Lanier Quarry Savanna, both examples of wet savannas that have become somewhat invaded by shrubs.

Based on our collection dates, *A. sinescripta* is probably bivoltine in North Carolina; adults were obtained in late spring in May and June and again in September. *A. lanceolaria* is probably univoltine -- Profant recorded it only in March in central Florida and we captured our one specimen in mid-April. Northward, where it is more commonly collected, it is also exclusively a spring species.

The larvae of both species probably live up in the foliage of their host plants, as do other members of this genus. Pupation probably occurs in the upper layer of ground litter in both species; *lanceolaria*, *oblinita*, and another related species *distans* all spin cocoons among leaves or dried grass. These features probably make these moths quite vulnerable to fires hot enough to kill shrubby vegetation, or even to cool fires during pupation. There also does not appear to be any time during the year when they would not be vulnerable to fires used to kill back woody vegetation.

Agrotis buchholzi. This was one of the targeted species of this survey. Before we began, this moth was known from only the most xeric habitats located in the core of the New Jersey Pine Barrens (Schweitzer, 1989; J.B. Sullivan had actually collected a specimen from the Croatan National Forest in 1990, but it was not identified until 1992). Since the larvae of this species appear to be monophagous on the pixie moss (*Pyxidanthera barbulata*) (Schweitzer, unpubl.), a species that occurs primarily in the New Jersey Pine Barrens and in the fire-maintained coastal plain communities of North Carolina, this species seemed like a good bet to turn up in our inventory. Indeed, we collected it from both of the survey sites where the pixie moss also occurred, at Shoestring Savanna and Angola Creek Flatwoods.

These specimens are significantly larger than those from New Jersey and also more boldly marked. It seems quite likely, therefore, that they represent a new subspecies. Our collection records indicate that this moth is at least bivoltine; adults were found in April and again in June. There is also evidence for a third brood in September (based on one specimen). It is bivoltine in New Jersey.

Unlike the two species of *Acronicta*, the larvae of this species are burrowing cutworms, as is typical of the Noctuinae: caterpillars of this type hide below ground during the day and come up to feed only at night. Since they probably also hibernate beneath the soil as pre-pupal larvae, they are likely to survive fires during most of the year. Moths with this type of life-history probably represent the most fire-tolerant of the species we collected, which pre-adapts them for tight associations with host plants such as *Pyxidanthera*, which require frequent fire to avoid being shaded-out by taller herbaceous ground cover. It should be noted, however, that even these species could be affected by fire during the egg stage. Adults also need the host plants to be present in order to choose appropriate sites for oviposition.

Anomogyna youngii? Although we have not completely resolved all questions as to the identity of these specimens, we are fairly confident that we collected several individuals of this northern peatland species. Its main range lies from Labrador south to New Jersey, and it occurs at least as far west as Ohio, where it is listed as Endangered (Rings, et al., 1992). There appear to be no previous records for this species from the entire Southeast.

The habitat is generally described as acidic bogs and the recorded host plants include *Vaccinium*, *Larix*, *Chamaedaphne*, and *Myrica gale*. Since *Chamaedaphne* is present in the pocosins of the outer Coastal Plain of North Carolina, and since flatwoods in this area are characterized by thickets of *Vaccinium* and contain several species of *Myrica*, it is perhaps not completely surprising to find this species here. We collected four specimens at Angola Creek Flatwoods and four from Shoestring Island, the two sites that contained the greatest proportion of pocosin and flatwoods habitats. We also collected three specimens at Lanier Quarry Savanna, where the trap site was located fairly close to a wetland edge.

All of our specimens were collected in October, which is consistent with the univoltine, autumn emergence recorded in the North. The larvae probably hide in sphagnum or other surface cover

during the day and ascend their host plants at night. Although the wetness of their bog or pocosin habitats should offer protection from most fires, this species would be vulnerable to the fires that occasionally burn pocosins to the ground during periods of hot, dry weather. Populations occurring in flatwoods habitats would be vulnerable to fires at virtually any season.

Argyrostrotis erasa and A. deleta These two species, along with *A. sylvarum* and *A. flavistriaria*, are relatively little known southern moths. Kimball (1965) records them from Florida, although none of these species have been taken at two well-collected sites in central Florida (Profant, 1989; Minno, 1992). They are apparently not known north of North Carolina and even within this state they have been somewhat overlooked. None of these four species, for instance, were recorded by Brimley (1938) and only *sylvarum* and *erasa* were added by Wray (1967). Furthermore, relatively few specimens have been added to the North Carolina institutional collections since 1967. The NCSU collection contains only one specimen of *A. flavistriaria* (reared by D. Stephan from a larva collected in a Lenoir County pocosin) and the NC Museum of Natural Sciences has just two specimens of *A. erasa* (one from Warsaw and one from Raleigh) and five specimens of an *Argyrostrotis* labeled as *A. carolina* but which might represent *flavistriaria* (two from Raleigh and three from White Lake).

On the other hand, both *erasa* and particularly *deleta* appear to be quite characteristic of longleaf pine habitats (*sylvarum* and *flavistriaria* both appear to be fairly widespread pocosin species). J.B. Sullivan reports them as abundant at his trapping stations next to the Croatan National Forest (pers. comm.) and they were some of the most common species we collected in our light traps as well as observed during the day (*flavistriaria* also came abundantly to bait). We found both species at each of the four preserves and in nearly every month of the survey: *A. A. deleta* was collected April through September, and *A. erasa* April through August.

Little appears to be known about the host plants or other ecological relationships of these species. Based on recent information, *A. sylvarum* is suspected to feed on *Lyonia*, and a specimen of *A. flavistriaria* reared by D. Stephan also appeared to prefer *Cyrilla racemosa*. Reports of other species in this genus feeding on forbs now appears to be quite doubtful.

Based on what is known about other species in the same group, the larvae are either climbing cutworms, i.e., hiding under surface litter during the day and ascend to feed on their host plants at night, or permanent residents in the foliage. Such behavior would appear to make them vulnerable to fire virtually throughout the season. However, their survival in annually-burned sites such as the Big Island Savannas of the Green Swamp suggests they are either good at recolonization or possess other adaptations to survive frequent fire (probably below-ground pupation). This hypothesis is also supported by the data we obtained following a prescribed burn at Myrtle Head Savanna (see Table 7). The existence of multiple broods further means that recovery from a fire is likely to be rapid.

Cleora projecta. This is an uncommon to rare geometrid moth that ranges fairly widely in eastern North America (Covell, 1984). It appears to be primarily an inhabitant of bogs and other

wetlands and may be restricted to the best quality examples of these habitats (Schweitzer, pers. obs.). Its one recorded host plant is *Myrica gale*, which does not occur in southeastern North Carolina (*Myrica cerifera* var. *pumila* and *M. heterophylla* are both common, however). In New Jersey, where it appears to be confined to pitch pine lowlands in the core of the Pine Barrens, it feeds on various species of heaths (Schweitzer, pers. obs.).

This species was not recorded for North Carolina by either Brimley or Wray, and specimens are not present at either NCSU or the NC Museum of Natural Sciences. On the other hand, several specimens have been collected near the Croatan National Forest by J.B. Sullivan, who does not consider it to be at all rare in that area (Sullivan, pers. comm.).

Three of our specimens come from Shoestring Island in the Green Swamp, one from Angola Creek Flatwoods and one from Lanier Quarry Savanna. This species appears to be univoltine, with the adults flying in April and May, the same period as recorded in New Jersey (Schweitzer, pers. obs.). Like other geometrids, the caterpillars of this moth reside on the vegetation, which should make them highly vulnerable to fire during the larval period. Pupation, however, takes place within the soil, which should confer some degree of safety from fire during the summer, fall, and winter.

Doryodes new species. This species has only recently been recognized as distinct from the more widespread *Doryodes bistrialis*, which inhabits coastal marshes; it has yet to be formally described. Although little is yet known about its distribution and ecology, this species appears to inhabit savannas and flatwoods. It occurs at least as far south as Florida (Dave Baggett, pers. comm.) but may reach its northern limit in North Carolina. Neither Brimley nor Wray list any sites for this genus away from the immediate coastal areas, and all specimens at NCSU and the NC Museum of Natural Sciences were obtained from salt marsh habitats.

Like the species of *Argyrostrotis* described above, we observed this species at all four of the preserves and in all months covered by the survey except May. The larvae probably feed on grasses, and may reside up in the foliage. Pupation takes place in the base of grass clumps or in leaf litter.
Depending on the wetness of the habitat and the intensity of the fire, probably a few pupae or even larvae could escape fire in the shelter of the grass clumps. As with the species of *Argyrostrotis*, its ability to recolonize may be substantial, and the existence of multiple broods means that populations can build back up fairly rapidly following a fire.

Euagrotis lubricans. Like the species of *Argyrostrotis* and *Doryodes n. sp.*, this moth appears to be restricted to the Southeastern Coastal Plain, where it occurs from North Carolina to Florida (a record from Ohio mentioned in Forbes, 1954, was deleted by Rings, et al., 1992). No specimens exist, however, in either of the two institutional collections in North Carolina (seven specimens in the NC Museum of Natural Sciences that are labeled as *lubricans* are actually *E. illapsa*; the specimens recorded by Brimley from Raleigh and Blowing Rock probably also represent this

species). J.B. Sullivan, however, has obtained it at his trapping stations near the Croatan National Forest, but regards it as fairly uncommon.

This is yet another species that appears to be quite characteristic of savannas and flatwoods, and may be virtually restricted to these habitats. In Florida it has been reported from xeric sandhills scrub (Minno, 1992) and wiregrass savannas (D. Baggett, pers. comm.) and we obtained it in all four of the preserves and in all months except August.

Although the host plants of this species are unrecorded, the larvae are probably general feeders on forbs and graminoids. Like other members of the Noctuinae, the larvae are probably burrowing cutworms, which should confer the same sort of resistance to fires expected for *Agrotis buchholzi*. On the other hand, this is one species that appeared to disappear after the prescribed burn at Myrtle Head (see Table 7).

Exyra fax and E. ridingsii. Larvae of this genus feed exclusively on pitcher plants (*Sarracenia* spp.), and consequently are restricted to open, boggy habitats. *Exyra fax* feeds solely on *Sarracenia purpurea* and occurs in northern bogs in eastern Canada and the Northeast, and in both bogs and savannas in the Coastal Plain southward to North Carolina (Lafontaine and Poole, 1991). *E. ridingsii* conversely feeds only on *Sarracenia flava* and occurs from North Carolina southward to Florida and the Gulf Coast (Lafontaine and Poole, 1991). Both these species, as well as *E. semicrocea* (which we did not identify), are represented by a number of specimens at NCSU and the Museum of Natural Sciences.

Although characteristic of savanna habitats, pitcher plant moths are believed to be highly susceptible to fire, particularly in the dormant season. Jones (1907) found that *E. ridingsii* survived winter burns only where there were unburned patches of sarracenia. Eggs, caterpillars, pupae, and even the adults reside within the pitchers of their host plants and even moderate fires are probably sufficient to destroy all individuals within a burned area. These species are thus highly likely to be obligate recolonizers. Compared to the other savanna species, relatively few specimens were obtained of these moths. They were, however, found in all four of the preserves (although not all specimens could be identified to species). Collection dates for definite specimens of *fax* include July, August, and September, but only June for *ridingsii* (May and June were also the collection dates for the specimens at NCSU and the Museum of Natural Sciences). The records for the unidentified specimens fall in the range from June to September and thus may include both species or even the third pitcher plant moth, *Exyra semicrocea*.

Gabara distema and G. pulverosalis. This genus of moths is notoriously difficult to separate to species (Richards, 1942). However, we believe we have good samples of both *G. distema humeralis* and *G. pulverosalis*, which appear to be fairly distinctive in terms of external morphology.

Both species are thought to feed on graminoids and occur in a variety of dry to moist, open habitats. *G. distema* is restricted to the South (North Carolina to Florida and west to Arkansas --

Forbes, 1954) and may be a characteristic species of wet savannas. The majority of our records (46 out of 53) come from Lanier Quarry, Myrtle Head, and the roadside savannas in the Green Swamp. Adults were found in May, June, July, and September.

G. pulverosalis, in contrast, appears to be associated with drier sites. This species is found in the New Jersey Pine Barrens (although often in wet swales), as well as at Tryon in western North Carolina and at Southern Pines in the Sandhills (Richards, 1942; the four specimens in the Museum of Natural Sciences labeled as *G. distema* may actually belong to this species). All of our specimens come from Angola Creek Flatwoods or Shoestring Island, two examples of drier flatwoods habitats. Adults were captured only in June and July.

The larval habits, pupation sites, and consequently the fire vulnerability of these species are all essentially unknown. Like the other species characteristic of savannas and flatwoods, they may be particularly dependent on recolonization following a fire in order to maintain their presence within an area.

Hemipachnobia subporphyrea subporphyrea. This moth appears to be the rarest species collected in the survey. Although another subspecies, *monochromatea*, is fairly widespread in northern acidic wetlands, where it feeds on sundew (*Drosera* spp.), the southern form is next to unknown in collections. It was originally described from a painting done by John Abbot in the late 18th or early 19th Century, and the type locality is given as Georgia and Florida, as true for many of Abbot's type specimens (these were the only two localities mentioned for this subspecies by Forbes, 1954).

No specimens apparently exist, however, from anywhere but North Carolina (Kimball does not list it for Florida, for instance, and also discounts all lepidoptera records for that state attributed to Abbot). In addition to the five individuals we collected, J.B. Sullivan obtained a single individual from near the Croatan National Forest (which he regards as a stray -- pers. comm.) and the two specimens in the NCSU collection were obtained from Bladen County (no specimens exist in the NC Museum of Natural Sciences and none were recorded by either Brimley or Wray).

The reason for its highly restricted occurrence may have been recently explained. Aubry Shaw, a Bladen County resident who propagates carnivorous plants, had noticed over the years that a certain kind of caterpillar could be found on the undersides of the leaves of Venus flytraps (*Dionaea muscipula*), a species that is a close relative of the sundews and endemic to the Coastal Plain of the Carolinas. He sent several of these larvae to David Stephan of the NC State University Extension Service, who subsequently reared two of them to maturity on *Dionaea* (D. Stephan, pers. comm.). The adult *Hemipachnobia s. subporphyrea* that emerged after a year's worth of effort probably represented the rediscovery of a moth that had not been seen for almost 200 years.

This hypothesis leaves the type locality unexplained, but it should be noted that Abbot collected in the area around Savannah, which is located within 100 miles of the most southerly known

occurrence of *Dionaea*, in Charleston County, South Carolina. Perhaps he collected further to the north along the coast, or perhaps flytraps once existed further south. Abbot could also have collected his specimens during his original migration from Virginia to Georgia, or he may have obtained them from someone else who collected them in the Carolinas. In any case, there seems to be no support for the supposition that this subspecies occurs more widely. If it fed on *Drosera*, it should probably be as common as the northern form.

We collected this moth only at Lanier Quarry Savanna, where local people have traditionally harvested flytraps for sale to nurseries. Four specimens were collected on April 13th, and one much more worn specimen on May 9th. The two specimens reared outdoors by D. Stephan also eclosed in April.

On May 4th, 1992, we attempted to find this moth in the Green Swamp, where flytraps are abundant. Despite setting traps in the middle of flytrap patches in Little Island and Shoestring Island, and sheet sampling near a patch in the Big Island Savanna, no specimens were obtained. The overall catch that night was relatively sparse, however, due to a cold front that had moved through during the day. On the other hand, we did not obtain this species in either 1991 or 1992 from Myrtle Head Savanna, where flytraps also occur close to the trap sites, nor at Angola Creek in 1991, where a few flytraps are also present. This species may, in fact, be rarer than the rare plant upon which it feeds.

In the northern subspecies, the caterpillar hibernates underground as a mature larvae, and pupation also occurs underground. This suggests that it would survive fires occurring during the winter. On the other hand, Aubry Shaw observed caterpillars resting during the day on the undersides of the host plant's leaves, which could possibly make it vulnerable to growing season burns.

Macrochilo louisiana. Members of this genus are inhabitants of moist grasslands, where their larvae probably feed on both grasses and sedges. This particular species is found from Nova Scotia to Florida and west through the Gulf States but is collected fairly uncommonly and may be very rare in the northern part of its range (Ferguson, 1982). We collected just one specimen of this moth, from Lanier Quarry in September 1992, but J.B. Sullivan has collected it commonly near the Croatan National Forest (J.B. Sullivan, pers. comm.). No specimens exist in either of the two institutional collections in North Carolina.

Little is known about the larval biology of the North American species of *Macrochilo*, but the one European member of this genus appears to reside on its host plant grasses and sedges and it pupates on the ground (Ferguson, 1982). These traits likely make these species vulnerable to fire throughout their life cycles.

Metarranthus lateritiaria. This geometrid moth is quite rare in collections and is little known. Forbes (1954) describes *lateritiaria* as occurring from Maine to New Jersey in apparent association with acidic habitats, but he appears to have been referring to yet another species. *M.*

lateritiaria appears to be unknown in Florida (not recorded by Kimball, 1965; Profant, 1989; or Minno, 1992), and it was not listed for North Carolina by Brimley or Wray. No specimens are present in either of the two institutional collections, nor has J.B. Sullivan collected it near the Croatan National Forest.

This species probably feeds on some species of the Ericaceae and may therefore be associated with either flatwoods or pocosin habitats in the Coastal Plain. We obtained specimens from Shoestring Island in the Green Swamp, which contains extensive areas of both types of habitat. However, we also collected five specimens from Lanier Quarry Savanna, which is more representative of wet savannas than flatwoods or pocosins.

All of our specimens were captured in May, and the species thus appears to be univoltine. The larvae probably reside up on their host plants where they would be quite vulnerable to fires. Pupation, however, almost certainly occurs below ground, which would confer some degree of safety from approximately late June or July until the time of hatching.

Morrisonia new species. This species is apparently confined to the Coastal Plain of the Southeast; North Carolina may represent its northern limit. J.B. Sullivan has collected it commonly near the Croatan National Forest, and the two specimens present in the NCSU collection were obtained from Pender and Bladen County.

Little is known about its biology but other species of *Morrisonia* feed on woody species of plants, both trees and shrubs. It may, thus, be an inhabitant of pocosins or flatwoods.

We obtained our specimens from all four preserves and in every sample period from April through July. Species in this subfamily, the Hadeninae, reside up in the foliage of their host plants but pupate below ground. Except during the pupal period, fires hot enough to penetrate into pocosins are thus very likely to destroy populations of this species.

Papaipema appassionata. The genus to which this moth belongs all possess larvae that are borers in the stems or root stocks of herbaceous plants. This particular species is associated with pitcher plants and occurs in coastal bog and savanna habitats from Nova Scotia to Florida and west through New York and the Great Lakes states as far as Wisconsin (Covell, 1984). Few specimens are known from North Carolina, however. It was not recorded for North Carolina by either Brimley or Wray, and has not been collected by J.B. Sullivan from his stations next to the Croatan National Forest. A single specimen from Bladen County exists in the NCSU collection and we obtained our one individual from Myrtle Head Savanna.

Members of this genus tend to be highly colonial and most are well-known to be extremely vulnerable to fires occurring from fall to spring. This species bores into the rhizomes of the pitcher plants, rather than the stems, and probably survives fires that occur during the growing season. The adults emerge in October, as is characteristic for many species of *Papaipema*.

Scopula purata. This geometrid moth occurs locally from New Hampshire to Florida and westward along the Gulf Coast to Mississippi in association with acidic bogs and other open wetland habitats (Covell, 1984; Schweitzer, pers. obs.). Outside of the central Pine Barrens of New Jersey, it appears to be a fairly rare species, although J.B. Sullivan collects it commonly near the Croatan National Forest (it was not recorded from North Carolina by either Brimley or Wray, however, nor are any specimens present in the NCSU or NCDA collections).

Only one specimen was collected during this survey, from Shoestring Savanna in July, 1991. In the far north, there is one brood in July; in New Jersey it flies mostly in June and August. Further south it may have as many as three broods. Like other geometrids, its larvae probably resides up on the host plant, which is unknown. Pupation probably occurs in the soil or in sphagnum, which should give it some protection from fire even during the dormant season.

Spartiniphaga carterae. This species, another of our main targets, was described in 1984 by Schweitzer. Previous to this survey, it held a distributional status similar to that of *Agrotis buchholzi*, in that it had been collected almost exclusively from the Pine Barrens of New Jersey (J.B. Sullivan had collected a specimen of this moth in 1970 near the Croatan National Forest, but this specimen had not been identified to species prior to the beginning of our investigation). Again like *buchholzi*, however, its presumed host plant -- another fire-adapted species, *Calamovilfa brevipilis* -- occurs fairly widely in the fire-maintained communities of the Coastal Plain of North Carolina, including some of the preserves covered by our investigation. For that reason, it seemed likely to turn up in our traps.

Indeed, paralleling our success with *Agrotis buchholzi*, we collected six specimens from a trap situated near an extensive patch of the host plant at Lanier Quarry Savanna. However, we also obtained single specimens from sites where *Calamovilfa* was not known to occur: at Angola Creek, which may have a few remnant, fire-suppressed patches of this grass, and at Myrtle Head Savanna, where there were no known populations of *Calamovilfa* anywhere within miles of the site[5]. All our specimens were obtained in October, which is consistent with the univoltine, fall emergence recorded in New Jersey.

Members of this genus inhabit wet grasslands, where their larvae are borers in the stems of various kinds of graminoids; *S. inops* feeds on *Spartina pectinata*, but others feed on other species of grasses or *Carex*. *S. carterae* appears to be further restricted to areas where frequent fires occur, which are needed to maintain healthy populations of its presumed host plant. In New Jersey, for instance, both the moth and *Calamovilfa* were found to be extremely abundant at several sites that had experienced very hot, growing season fires in the recent past (Schweitzer, 1993). Although this moth may be adept at recolonization, the thick basal portions of the stems of *Calamovilfa* should serve as a fire-refugia for the larvae except in the case of fires occurring in hot, dry weather (not the normal conditions for lightning-ignited fires in the Southeast); it clearly

[5] Following the burn in 1993, this grass was discovered growing on the northern part of Myrtle Head (R. LeBlond, pers. comm.), validating our predictions based on the presence of the moth.

survives summer crown fires in New Jersey. Eggs and young larvae would be vulnerable, however, to dormant season burns.

Calamovilfa brevipilis was previously considered to be quite rare, which partly accounts for the status of the moth as a candidate for federal listing. However, it is now known to be much more extensive in its distribution, and is actually common within frequently burned regions of both the sandhills of North Carolina and New Jersey Pine Barrens. If the moth turns out to have a similar distribution, then its status as a globally rare species should be downgraded.

Spilosoma dubia. Forbes (1960) described this species as almost restricted to the Canadian life zone and not known south of Long Island, New York. Its subsequent discovery in Florida, consequently, came as a great surprise (Kimball, 1965). Even with this great southern range extension, however, this moth remains quite rare south of New York (Covell, 1984). It was not recorded for North Carolina by Brimley or Wray, nor are any specimens present in either of the two institutional collections in North Carolina. Outside of Florida (where it was also reported by Minno, 1992), the four populations we discovered and the one at the Croatan National Forest found by J.B. Sullivan may be the only other known occurrences of this species in the entire Southeast.

All our specimens were obtained in April, which agrees with the early spring dates recorded by Kimball for Florida; this species thus appears to be univoltine throughout its range. We found it on all four of the preserves but collected more than one individual only at Shoestring Island, where we obtained three. Its habitat in the north includes bogs and barrens, and in the south it may therefore occupy both wet savannas and flatwoods.

Members of this subfamily of tiger moths (the Arctiinae) all have caterpillars commonly known as wooly bears. They live strictly above ground, where they forage on a wide variety of plants. *Spilosoma dubia* has been observed to feed on plantains and wild cherry (Forbes, 1960; Covell, 1984), but based on the host plant range of its congeners, may feed on a much wider variety of herbaceous and woody species. Given the above-ground habits of the larva, and the fact that it also pupates in surface litter, this species is probably highly susceptible to fire at virtually all seasons of the year (moist litter might confer some degree of protection from light, winter burns).

Dasychira atrivenosa, Idaea violacearia, and Nematocampa baggettaria. These three species appear to be fairly rare, at least within collections, but may not be strongly associated with the fire-dependent communities under investigation here.

Dasychira atrivenosa has been successfully reared on *Liquidambar styriciflua* but has been collected far more rarely than would be suggested by such a diet. It is currently known only from the Southeast, from Annapolis, Maryland and Carteret County, North Carolina south to Florida and west to Texas and Arkansas (Ferguson, 1978). We obtained single specimens from Angola Creek Flatwoods, Myrtle Head Savanna, and Little Island Savanna in the Green Swamp. In all

cases, they may have flown in from areas of hardwoods located nearby. J.B. Sullivan collects it commonly at his sites near the Croatan.

Ferguson (1978) states that there appear to be two broods, the adults being observed in the Carolinas in May and June and again in August and September. Our results are consistent with these findings, although we also obtained one specimen in July in addition to June and September. Caterpillars reside above ground on their host plants and also pupate above ground; these traits would make them vulnerable to fires invading hardwood stands, although the wet habitats favored by sweetgum probably burn too infrequently for fire to represent much of a threat to this species.

Idaea violacearia occurs from Florida north to New Jersey (Forbes, 1948; Kimball, 1965), and disjunctly westward on the Great Lakes sand dune habitats in Pennsylvania (where it has been collected by Charles Bier) and Ontario (Schweitzer, pers. obs.). It appears to occupy a variety of dry or sandy woodlands. The host plants of this species are unrecorded but other members of this genus feed on low herbaceous plants. Not enough appears to be known about this species to identify it as particularly representative of savannas or flatwoods habitats. We obtained this species both at Angola Creek Flatwoods and at the Green Swamp from Shoestring Island and Little and Big Island Savannas. J.B. Sullivan has also found it commonly next to the Croatan National Forest.

This species may be bivoltine in North Carolina. We obtained specimens in June and July and once in September, similar to dates recorded in New Jersey. As is the case with virtually all geometrids, and particularly those that feed on low herbs, this moth is likely to be susceptible to fire at virtually all times during the larval period. By pupating underground, it may be relatively safe during the dormant season.

Nematocampa baggettaria was described just this year and little is yet known about its biology (Ferguson, 1993). This species appears to be restricted to the Southeast: records exist from Lumberton, North Carolina south to northern Florida and west to Louisiana (it has not been found by J.B. Sullivan at his sites in Beaufort County). Its host plants are unrecorded but the sympatric *N. resistaria* feeds on an extensive variety of plants, including conifers, hardwoods, shrubs, and herbs.

Further south, this species appears to fly throughout the growing season, from April to September. We obtained our single specimen in June from Myrtle Head Savanna. Like our specimens of *Dasychira*, this moth could have flown in from surrounding areas but could also feed on shrubs normally associated with either flatwoods or savannas. As is true for other geometrids, it is probably vulnerable to any fire penetrating into hardwood forests during the larval stages but is probably safe from most winter burns due to underground pupation.

BUTTERFLIES

The biology of this group of insects is much better known than for the moths (see range maps and other information supplied by Opler, 1983; Opler and Krizec, 1984; Opler and Malikul, 1982; and Scott, 1986), and the similarity among their life histories also make them easier to summarize as a group. Apart from *Atrytone arogos* and *Hesperia attalus*, they will not be covered here in as much detail as the preceding species.

Virtually all the species included in Table 3 are species of open habitats, where their larvae feed strictly on herbaceous plants. The little metalmark (*Calephelis virginiensis*) feeds on yellow thistle (*Cirsium horridulum*) and the frosted elfin (*Incisalia irus*) feeds on wild indigo (*Baptisia* spp.) and lupine (*Lupinus perennis*). The remainder, all members of the skipper family (Hesperiidae), feed on various graminoids.

The species included here as elements seem to be particularly associated with open habitats that are naturally occurring along the eastern seaboard; unlike many other butterflies, they have not spread extensively into the more disturbed habitats opened up by agriculture and clearcutting. Seven of these twelve species are southeastern in their distribution, at least along the east coast: *Amblyscirtes alternata, Calephelis virginiensis, Oligoria maculata, Problema byssus, Amblyscirtes reversa, Atrytonopsis loammi,* and *Euphyes berryi*. These are the species that are probably most characteristic of savanna and flatwoods habitats. The rest also occur in other communities, including coastal grasslands and marshes, bogs, and barrens.

Although probably all of these species depend on fire to maintain the openness of their native habitats, few are known to possess adaptations that allow them to escape being burned except during the mobile adult stage: with only a few exceptions, eggs, caterpillars, and pupae all occur above ground. The skippers are particularly vulnerable in this regard, since their larvae usually reside well up in their highly flammable host plants in shelters they construct by spinning together leaves; they also typically pupate in these structures. Virtually all the butterflies on this list, consequently, are highly likely to be obligate recolonizers following a fire (see Swengel, 1991 and Dana, 1991, for recent reviews of the fire-sensitivity of butterfly species).

Atrytone arogos and Hesperia attalus slossonae. These two skippers were not observed during our survey but have been reported to occur in the Green Swamp (J.B. Sullivan, pers. comm.). They also appear to be particularly important for conservation efforts. These species once ranged from Long Island and Nantucket Island, respectively, south to Florida along the east coast, with disjunct populations or subspecies occurring in the midwestern prairies and Gulf Coast grasslands. They now appear to be declining or outright missing from much of their former range.

The arogos skipper, in particular, may no longer occur north of North Carolina, and may be down to just a few scattered populations here. It is now considered to be one of the rarest butterflies in the eastern United States (Schweitzer, 1987). A similar downward trend is also believed to be

true for *Hesperia attalus slossonae*, although this species has not been as well studied. It still occurs regularly in three or four counties in New Jersey.

The exact causes for the decline of these species have not been conclusively identified, but loss of native grassland habitats due to fire suppression and conversion to other uses is strongly suspected. The arogos skipper, in particular, is thought to move into an area soon after a fire has passed through; it also typically vanishes from a site long before its host plants, *Andropogon* spp., have been vanquished by competing vegetation (Schweitzer, 1987; J.B. Sullivan, pers. comm.). Some factor other than direct host plant loss appears to be involved in this emigration. Perhaps it is loss of nectar-producing flowers, many of which bloom most abundantly following a fire, or the need by the larvae for fresh growth of the host plants stimulated by fire. Since it overwinters well above ground in the dried leaves of its host plant, it is decidedly vulnerable to fires occurring at any time during the year.

A similar situation may likewise exist for *attalus*, which is also reported to feed on several fairly widespread coastal plain grasses: *Aristida virgata*, *Lepteloma cognatum*, *Bouteloua curtipendula* var. *caespitosa* (Scott, 1984; it apparently does not feed on *Panicum virgatum*, another host reported in the literature); oviposition behavior has also been observed on *Andropogon scoparius* in New Jersey (Schweitzer, pers. obs.). Again, some other fire-dependent habitat feature may be involved in explaining its currently restricted or declining range (although in New Jersey, it may be shifting to artificially maintained open areas). The same may also apply to the other skippers listed in Table 3, none of which is believed to be monophagous on completely fire-dependent species of grass. Fire sensitivity for all these species is essentially unknown, although likely to be high.

ORTHOPTERA

Melanoplus decorus and M. nubilus. These two species of small, flightless grasshoppers are the only species recorded in this survey that appear to be endemic to North Carolina. In their survey of the orthoptera of the Southeast, Rehn and Hebard (1916) found *M. decorus* only in the southeastern corner of North Carolina, in the vicinity of Wilmington in New Hanover County, Lake Waccamaw in Columbus County, and New Bern in Craven County. They found *nubilus*, which they described in this work, only near Fayetteville in Cumberland County.

A few additional records have been added since that time. The NCSU collection contains 16 specimens of *decorus* from the Burgaw Savanna (now destroyed), 16 from Holly Shelter (which is protected as State Gamelands), 10 from Atkinson (which also still contains good quality habitat), two from Core Point in Beaufort County, and one each from Wilmington, Castle Hayne, Tarboro, and Harnett County. These records, some of which duplicate the findings of Rehn and Hebard, are all from the lower Coastal Plain.

The NCSU collection also contains several new locations for *nubilus*. Apart from the 14 from Spout Springs (now believed to be destroyed) and two from Hoffman, both in the Sandhills, two

were collected from a site inland from Holden Beach, one from Southport, and one from Chadbourn, all in the outer Coastal Plain. Hall has also found this species in the sandhills at Fort Bragg.

Both these species belong to the *decorus* group of *Melanoplus* (Rehn and Hebard, 1916). The five known species in this group all appear to be confined to the Lower Austral Life Zone, or what Rehn and Hebard termed the Sabalian Life Zone due to the distinctive presence of sabal palm throughout most of its extent. They also appear to be nearly restricted to the region between North Carolina and Georgia; none occur in Florida (Rehn and Hebard, 1916; Blatchley, 1920; Peck, et al., 1992), and only *Melanoplus hebardi* barely reaches Alabama (Dakin and Hays, 1970).

All the species in this group possess brachypterous adults, i.e., individuals with wings that are scarcely more developed than in the nymphal stages and equally incapable of flight. As is true for other short-winged forms of *Melanoplus*, species in this group appear to be much more localized and habitat specific than their long-winged congeners; they are also more likely to occur in shrubby areas than open fields or grasslands (Blatchely, 1920).

Rehn and Hebard described the habitat of *M. decorus* as the margins of swampy tracts or low depressions in pine woods; pitcher plants, Venus flytraps, grasses, and low bushes were observed in association. We also found this species most commonly in ecotonal areas between savanna and pocosin habitats at Lanier Quarry and several sites within the Green Swamp, all of which closely agree with Rehn and Hebard's description. Adults of this species and other brachypterous *Melanoplus* observed but not captured were all found between August and October; it thus appears likely that there is only one brood per year.

The type locality for *M. nubilus* is given as a shortleaf pine woodland located around a mill pond at Fayetteville (Rehn and Hebard, 1916) . Like *decorus*, this species appears to be an ecotonal inhabitant. Rehn and Hebard describe seeing several males perched up in gallberry (*Ilex glabra* or *I. coriacea*) and we also found it in shrubby ecotonal areas at Lanier Quarry and Myrtle Head Savanna. We collected our two specimens in August and September.

Since these species are absolutely flightless and are capable of making only short leaps, they certainly cannot escape a fire by out-distancing it, even as adults. They may, however, survive within the pocosins they appear to stick close to; these boggy areas burn only under conditions of extreme drought or when a fire is particularly intense. Escape could also be enhanced if the adults or nymphs actively take shelter in the basal clumps of grasses or sedges.

On the other hand, fires that succeed in burning even a short distance into a pocosin could pose a major threat to the survival of these species within an area, there probably being little chance now for recolonization. In order to assess this threat more precisely, more must be learned about how far into the pocosins these species range. They could also turn out to be pocosin species, which would probably mean they are more widespread than our survey seems to indicate.

Stethophyma celata. This grasshopper has a much more extensive geographic range than the two just described, but may be equally rare or even more so. The main part of its range occurs in the tallgrass prairie region in the Midwest, and it is also known from two widely separated areas located along the Atlantic Seaboard: in Massachusetts and Connecticut and in the Coastal Plain of the Carolinas (Otte, 1979, 1981 -- note that Otte missed the record for North Carolina given by Brimley, 1938). These eastern forms may constitute one or more separate subspecies (Otte, pers. comm.).

This species has always been regarded as scarce (Blatchely, 1920), and it may recently have become even rarer due to loss of habitats; apart from the ones we obtained, no specimens appear to have been collected since the 1940's (Otte, pers. comm.). As is true for other members of this genus, all of which can be termed sedge grasshoppers, it is an inhabitant of wet grasslands, which are some of the most highly imperiled habitats in North America. In the North and Midwest, it occurs in tallgrass prairies, tamarack bogs, and low, wet swales (Blatchely, 1920; Helfer, 1987; Otte, 1981). In the southeast, it may be restricted to wet savannas and bogs. Brimley (1938) recorded it from Burgaw, probably from the famous Big Savanna that is now long-destroyed (Wells,). Other specimens in the Insect Collection at NC State University come from Holly Shelter (which still contains extensive amounts of savannas) and the Spout Springs Pitcher Plant Bog in the Sandhills (which again appears to have been destroyed). Our specimens all come from Myrtle Head Savanna.

We collected two adult males in 1991, one in June and the other in July. Despite intensive efforts to locate specimens on other preserves and at Myrtle Head in subsequent sampling trips in 1991, no success was had. In 1992, we made a much more concerted effort during the sampling trip made on June 25 to learn more about habitat requirements, population size, and fire sensitivity of this species. We were particularly interested in locating specimens on the half of Myrtle Head where a prescribed burn had been conducted in June, 1991.

As in the previous year, no specimens were found at the Green Swamp (Lanier Quarry and Angola Creek were not visited this trip). In a 2.5 hour search of Myrtle Head Savanna, six males were observed (two photographed), all but one on unburned sections of the preserve. The habitat was similar in all cases. The grasshoppers were flushed from low vegetation adjacent to wet sedgy depressions, ditches or other gladey openings; none were observed in the better-drained grassy areas typical of the preserve as a whole. Small pools of water were present within 10 - 15' in four of the cases. The following plants seemed to be good habitat indicators: *Lachnanthes*, *Eriocaulon*, *Dichromena*, *Eleocharis*, and *Sarracenia flava*. Other plants observed at some of the sites included *Carex*, *Sparangium*, *Hypericum*, *Iris* and *Pleea*. The one site within the burned area was located along a line of sweet gums, red maples, and pond cypress; the same herbaceous species were also observed. This site was probably too wet to have burned in 1991 even though better-drained sections on either side were thoroughly scorched.

Although the grasshoppers appear to be associated with sedgy glades, all of the individuals flew into nearby shrubs when they were first flushed. The same behavior was also noted for a similar

looking species of *Melanoplus*, but the *Stethophyma* tended to keep moving through the shrubs and then back down into the herbaceous cover, whereas the *Melanoplus* tended to stick within the shrubs upon landing.

All specimens observed were males. This is in keeping with other observations that females are extremely hard to flush (Blatchely, 1920). One male was observed stridulating, which has not been described previously. Single notes were given at intervals slightly less than a second. The call sounded something like "whit, whit, whit, whit...", with each note sounding like a knife blade being sharpened on a whetstone; there was a slight metallic ring to them. The stridulations were fairly soft and could be heard distinctly only from 10 - 20 yards away (wind was blowing at the time and they may be audible over a greater distances when it is still).

Although this species is winged, its flight is fairly weak (it does not appear to be known whether the females can fly at all). Like the brachypterous species of *Melanoplus* discussed above, *Stethophyma* probably cannot escape a fire by out-distancing it and instead probably relies on the wetness of its habitat for survival. Any fire that is hot enough to penetrate into sedgy glades or pocosin ecotones could thus pose a serious threat to this highly localized species.

Element Occurrences within the Preserves.

Table 5 presents the distribution of the Natural Heritage element species within the four preserves. For purposes of comparability, these results only include the species we observed during the inventory; the additional butterflies seen by other observes at the Green Swamp are excluded. The numbers in parenthesis include only the species that are considered to be representative of the fire-maintained communities; left out are the three species of moths given in Table 4 that appear to be associated with hardwood forests.

Comparisons Between Trap Samples

Although the quantitative data obtained from the UV bucket traps contain too many site and temporal biases to allow meaningful statistical analysis, they are still useful for pointing out certain broad seasonal trends, as well as for making inferences about the effect of the prescribed burn conducted at Myrtle Head Savanna in 1991. Table 5 presents the summary for numbers of species and individuals obtained at the sampling stations established in 1991 (excluded are the accessory samples obtained in 1992 from new sampling stations in the Green Swamp and Lanier Quarry Preserves). The figures in parentheses represent data only for the distinctive species listed in Table 3. Individual data for the element species are given in Table 7.

Seasonal Trends

For all four of the preserves, there is pronounced bi-modal distribution in both numbers of species and individuals during the growing season. The maximum for both quantities occurred in May for three of the preserves and a secondary peak was also observed in this month for the

fourth (Shoestring Island). Following a low period in June, a second peak was obtained in July (the maximum for Shoestring Island). The one un-mixed August sample obtained from Lanier Quarry suggests that the trend was still upward during the late summer, although the change appears to be smaller than that observed between June to July. A decreasing trend is evident in all samples taken in September and October.

These trends for the overall data, however, are not strongly paralleled in the data for the most distinctive species, although this is possibly a reflection of the smaller sample sizes involved. Even so, most of these species occur in the spring (April and May) and the fewest occur in the fall (September and October). Inspection of Table 7 shows no evident trends among the element species, although the sample sizes are still smaller for this subset of the data.

Comparison of the Burned and Unburned Sections of Myrtle Head Savanna

The difference of 23 species and 91 individuals observed between the two trapping stations in the July (post-burn) sample for Myrtle Head seems to indicate that the prescribed burn had a major impact on the macro-moth fauna. The magnitude of this difference is far greater than any found between the two trapping stations at Angola Creek, even though they were separated by approximately the same distance as at Myrtle Head, and were set up in habitats that appeared to be more different than was the case originally at Myrtle Head.

Unfortunately, the comparison between burn treatments had not been planned in advance; we do not have data for the unburned side of Myrtle Head prior to the fire. Also unfortunate was the mix-up of the August data that prevented any comparisons for this sample interval. The September and October data suggest that in terms of gross numbers, at least, the effect of the fire is limited to just one or two months immediately following the burn.

When data for the individual element species are examined, the results are also somewhat equivocal. On the one hand, *Euagrotis lubricans* virtually disappeared from the burned side of Myrtle Head for the remainder of 1991 following the fire, while it continued to be common on the unburned side as well as at trapping stations on the other preserves. On the other hand, species such as *Argyrostrotis deleta* and *Gabara distema humeralis* showed no obvious differences between the two stations. Data for presumed fire-sensitive species, such as *Acronicta sinescripta*, and *Papaipema appassionata* are not substantial enough to make any valid judgements, although it should be noted that these two species were found only on the unburned side of the preserve following the fire.

Discussion

Faunal Affinities and Distinctiveness

It should come as no surprise that the vast majority of the insects identified in this survey are widespread species, typical of either disturbed, open areas or forested habitats. The fire-maintained communities of the Southeastern Coastal Plain now exist primarily as small islands within a man-altered landscape that is nearly uniform over the entire eastern United States. Species typical of Piedmont hardwoods are now likely to show up in samples taken from even the heart of the largest remaining coastal savannas. Conversely, many of the field-inhabiting species, such as the pearl crescent (*Phyciodes tharos*), whose ranges correspond to the area formerly covered by deciduous forest, may have spread outward from the naturally open and frequently disturbed ecosystems of the Coastal Plain, losing along the way whatever distinctive connection they once may have had to those ecosystems.

The situation we observed in southeastern North Carolina appears to closely match that documented for the better studied insect faunas of the Midwest. Panzer (1991) reported that just 10 - 20% of the insect species he collected in remnant prairies and savannas are restricted to those habitats. The species we identified as distinctive (see Table 3) likewise represent just 11% of the macro-moths, 17% of the butterflies, and 28% of the grasshoppers we observed. Although few in number, these species nonetheless indicate the special nature of the insect faunas of Southeastern savannas and flatwoods. As is true for the tall-grass prairie insects, these species show tight adaptations to their particular habitats and provide significant information concerning the complex biogeographic history of their communities.

The special nature of this fauna is perhaps most evident in the three species that are believed to be endemic to the Coastal Plain of North Carolina: the Venus flytrap cutworm (*Hemipachnobia s. subporphyrea*), and the two flightless grasshoppers (*Melanoplus decorus* and *M. nubilus*). The cutworm, of course, is as distinctive of the region as its host plant (although it has a sundew-feeding relative that is found much further north). The two grasshoppers, although probably not monophagous, may have been associated with the Southeastern Coastal Plain for even longer. All six species of the *decorus* group of *Melanoplus* are restricted to this region, and all appear to be confined to ecotonal habitats between pocosins and the more open savannas or flatwoods.

Almost as restricted geographically are Carter's noctuid (*Spartiniphaga carterae*) and Buchholz's cutworm (*Agrotis buchholzi*), both of which are candidates for federal listing. Like the Venus flytrap cutworm, these species are monophagous on fire-adapted plants, although in their cases on species that are found in both the Coastal Plain of North Carolina and the core of the Pine Barrens of New Jersey. This bimodal distribution is found in a number of other fire-adapted species, both plant and animal, and indicates a past biogeographic connection between these two regions. The marked divergence between the northern and southern forms of Buchholz's cutworm (Schweitzer, pers. obs.), as well as the differences in morphology and ecology of the

two subspecies (which may deserve full species rank) of *Hemipachnobia*, indicate that these two regions have been separated for a significant amount of evolutionary time, however.

Other species we consider distinctive of the fire-maintained communities of North Carolina are also found in other regions, but again only in similar grassland or peatland habitats. The largest group, representing 37% of the distinctive species, have ranges that follow the distribution of pine savannas and flatwoods south along the Coastal Plain to Florida and west along the Gulf Coast. Examples of these species include the slippery dart (*Euagrotis lubricans*), the granulated sulphur-winged grasshopper (*Arphia granulata*), and several of the butterflies (e.g., *Calephelis virginiensis*, *Neonympha areolata*, *Oligoria maculata*, and *Amblyscirtes alternata*). The overall distribution of the *decorus* group of *Melanoplus* also occupies this range.

Several other species have populations in the Mid-Atlantic Coastal Plain as well as subspecies in the prairie region of the Midwest. These include the byssus skipper (*Problema byssus*), arogos skipper (*Atrytone arogos*), and dotted skipper (*Hesperia attalus*). Although their ranges are fragmented now, they were probably continuous during the warm Hypsithermal interval, roughly 5000 years ago.

Another group possessing even greater northern affinities are those that inhabit peatlands -- bogs and fens -- as far north as New England or Canada. Included in this group are *Spilosoma dubia*, *Papaipema appassionata*, *Exyra fax*, *Anomogyna youngii* (if that is what we have), and *Euphyes bimacula*. Some of these species are probably relicts from the Pleistocene, when cool peatland habitats were widespread in the Southeast (Whitehead, 1964, 1981). This is also the likely explanation for the presence of the broad-winged sedge grasshopper (*Stethophyma celata*), whose primary range is in the northern tall-grass prairies but which is also known from a handful of peatland habitats along the Atlantic Slope. Most of these species, plus several in the more southerly group, have strongholds in the New Jersey Pine Barrens, again illustrating the biogeographic similarities of these two regions.

Despite their diverse origins (which adds to the scientific intrigue of these insects), the majority of these species share certain overlapping habitat traits, particularly a preference for open, wet habitats dominated by graminoids, forbs, or shrubs. In addition to the Venus flytrap cutworm, Buchholz's dart, and Carter's noctuid, several others are also monophagous or stenophagous on fire-loving plants. These include the pitcher plant moths (*Exyra fax*, *E. ridingsii*, and *Papaipema appassionata*) and grass-feeding skippers such as *Problema byssus*, *Atrytone arogos*, and *Hesperia attalus*. Other species, including all the grasshoppers and several of the more polyphagous moths (e.g., *Spilosoma dubia*) are probably more restricted by the physical features of the habitat than they are by association with particular species of host plants.

Adaptations to Fire-maintained Ecosystems

Frequent fire is one of the key physical features of the natural communities we studied and the insects most characteristic of these communities could be expected to possess elaborate means of

escaping conflagrations. There are, in fact, only a few types of adaptation apparently involved, none very complicated:

1. Burrowing and Boring. Moths whose larvae are burrowing cutworms (primarily Noctuid moths in the subfamilies Noctuinae and Hadeninae) may escape fire during the larval stages by sheltering beneath an insulating layer of soil. This group includes two of the species monophagous on highly fire-dependent host plants, the Venus-flytrap cutworm and Buchholz's dart, as well as another characteristic member of savannas and flatwoods, the slippery dart (whose host plant is unknown). Similar protection may also be obtained by species whose larvae are borers within fire-resistant portions of their host plants. Two species in this group are also monophagous on fire-dependent species: the pitcher plant borer (*Papaipema appassionata*), whose larvae are borers in the root-stocks of their hosts, and Carter's noctuid, whose larvae reside within the thick basal stems of the bunch grass, *Calamovilfa brevipilis*. These species, as well as the majority of Noctuids, Geometrids, and Notodontids, also gain protection during their pupal stages by pupating underground.

2. Canopy Dwelling. At the opposite extreme, larvae that feed high up in the canopy of mature trees escape at least the light ground fires that were once the norm for the Southeastern Coastal Plain (they would be consumed in crown fires, however). Species like the pine sphinx (*Lapara coniferarum*) and the pine-feeding geometrids, whose larvae reside in the canopy and pupate underground, are probably the safest members of this group. Species that pupate in surface litter are probably at higher risk, at least if they pupate during fire-prone periods of the year.

3. Sheltering in Wet Habitats. Due to their wetness, pocosins burn far less frequently than savannas or flatwoods; to a lesser extent, the same is true of wet swales and depressions located within more open, fire-prone areas. For weakly vagile species such as the broad-winged sedge grasshopper (*Stethophyma celata*) and the two flightless *Melanoplus*, a strategy of sticking close to the edges of these moist areas may account for their survival within fire-swept coastal plain habitats. Recolonization is a less viable option for these species.

4. Phenological Avoidance. For some species, particularly those with just one generation per year, timing of life-history phases to avoid occurrence of eggs, larvae, or pupae within the most fire-prone seasons may enable them to successfully occupy fire-maintained habitats. The broad-winged sedge grasshopper may gain some protection this way. Most of the summer and fall is spent in the egg stage, safely tucked away in the basal stems of bunch grasses or sedges. The nymphs hatch out in late winter or early spring and reach adulthood by late June, just as summer thunderstorms are becoming frequent. Another species employing a similar strategy is the pitcher plant borer. Adults emerge from their protected root-stocks in the fall after the main season of fire danger has passed. Eggs probably persist through the winter and early larval instars, which feed on the above-

ground portions of their host plants, occur during the early spring. By the time the natural fire season starts, the older instars have retreated into the root-stocks.

5. Obligate Recolonization. By far the majority of species do not appear to possess adaptations that would allow them to escape the effects of fire at all seasons of the year, or even during the normal fire season. The eggs, caterpillars, and pupae of most butterflies and of many macro-moths and the nymphs and adults of all grasshoppers occur entirely above ground, where they reside either on their host plants or hide during the day under surface litter. The majority of the lepidoptera, moreover, have two or more broods during the year and cannot enjoy the benefits of phenological avoidance of the fire season. Although escape responses to fire have been little investigated, most of these species could outrun a fire only during the brief adult period (if even then). The vagility of the adults, however, allows for quick recolonization of areas that have been cleared by recent fire. This is probably the key to their successful exploitation of fire-maintained habitats.

As described in the Introduction, the existence of a metapopulation is crucial to the survival of insects within a shifting habitat mosaic, particularly when the mosaic is created by frequent fire. This appears to be especially true for the distinctive species of the savanna and flatwoods communities, most of which do not show any special means to escape the destructive impacts of fire, particularly when the fire occurs out of the normal season. Of the 30 element species described in the Results that live primarily in open savannas or flatwoods, all but five species fall into the category of obligate recolonizers with respect to fire. Although the lack of fire survivability seems paradoxical in this group, it is actually an excellent indication of the high fitness that can be achieved in this environment by emphasizing colonizing ability.

Developing the few options available to insects for fire-survival, in contrast, appears to be a much less competitive strategy. Even such seemingly resistant species as the slippery dart (*Euagrotis lubricans*) may be more susceptible to fire than its burrowing larval and pupal behavior might suggest; this moth appeared to disappear from the burned half of Myrtle Head Savanna following the prescribed burn conducted in the late spring in 1991. Given the increase in winter burns and catastrophic spring wildfires, other species such as the broad-winged sedge grasshopper or Venus flytrap cutworm may also have lost whatever immunity they may have once had under a more natural fire regime. Our failure to collect these two species from the Green Swamp may possibly reflect the use of winter burns on an annual basis for most of the past sixty years.

Fire Management Issues

Most of the recommendations given in the literature for fire management with regard to insect conservation can be reduced to just two principles:

1. Fires that mimic the low intensity, patchiness, and normal thunderstorm seasonality of natural fires allow the few insects possessing some degree of fire-survival (adaptations One through Four above) to occasionally persist in burned areas.

2. Many insects, having no such adaptations, will be destroyed even by prescribed burns duplicating natural fires as closely as possible. The key to conserving these species is ensurance of metapopulational function, i.e., the survival of subpopulations in at least some unburned areas and the allowance of sufficient time between burns to allow for recolonization.

The first principle is actually the goal of most prescribed burns used to restore and maintain natural habitats in regions characterized by frequent fire. Most of the distinctive plants and vertebrates of these habitats -- the usual targets of conservation efforts -- possess adaptations for surviving fire, especially when the natural fire conditions are present. Conducting burns during the growing season, in particular, has been demonstrated to have many beneficial effects on these species while producing few detrimental side-effects (Jennings, 1989; Robbins and Myers, 1989).

The increasing use of growing-season burns, if it eliminates the need for winter fires, should also benefit many insect populations (Schweitzer, 1985). Adjustments may need to be made for certain species, however. The broad-winged sedge grasshopper, for instance, is still flightless in May and early June, the beginning of the natural fire season for the North Carolina Coastal Plain (May through August -- Jennings, 1989). Delaying prescribed burns until at least some reproduction has taken place -- which probably occurs by late June -- should help this species to persist within small, isolated preserves such as Myrtle Head Savanna.

Two additional recommendations for protecting the insect fauna are minimizing the use of backfires, since they travel more slowly and hotly than headfires (Panzer, 1988) and prohibiting the re-torching of skipped areas, particularly in wet sites (Panzer, 1988). With respect to the four preserves included in this survey, we urge that particular restraint be used in burning shrubs occurring in wet swales and in pockets of pocosin or swamp forest habitat. These sites harbor a number of rare species, including the broad-winged sedge grasshopper, the flightless species of *Melanoplus*, and several moths, e.g., *Acronicta sinescripta*, *A. lanceolaria*, and *Spilosoma dubia*.

Mimicking natural fires, while a worthy goal, can only go so far in maintaining insect biodiversity in the Coastal Plain savannas, flatwoods, and pocosins. Even apart from the difficulties inherent in attempting to duplicate conditions created by summer thunderstorms, the

vast man-made alterations of the landscape greatly complicate following the second principle mentioned above but also make it extremely crucial.

Historically, lightning-ignited fires would have burned enormous tracts of the flat Coastal Plain topography on probably at least a three year return rate overall (Ware, et al., 1992). Given the fluky winds, localized but drenching rains, and low intensities typical (but not universally true) of natural fires (Jennings, 1989), unburned refugia would have been scattered stochastically but abundantly across even the upland portions of the landscape; wet depressions would have provided still more. Even where these sites were small in size, there would have been a sufficient number to support recolonization across most of the landscape burned by any given conflagration.

With few exceptions, however, savannas and flatwoods in the North Carolina Coastal Plain are now restricted to just a few highly isolated, relatively small preserves. The existence of an extensive system of refugia is a largely thing of the past, particularly outside the boundaries of these preserves. Under these circumstances, even completely natural fires occurring in such isolated fragments pose great risks to the reduced insect populations that still depend on recolonization for survival. The game these species play has always been a gamble but the stakes are now much higher -- while fire may still leave some areas unburned within these refuges, they may not match the location of the insect populations.

A conservative strategy -- and the one we most recommend -- for conducting prescribed burns in small, isolated preserves is to burn only a fraction of the area during a given season. Recommendations vary from setting aside half of the preserve (Panzer, 1988), to two thirds (Opler, 1981). Although possibly larger than the refugia left by natural fires, these unburned units may now contain a substantially greater proportion of the remaining individuals of the rarest species within a region and should be treasured accordingly. Information regarding the location of specific colonies should be used in determining which areas to burn during a given year. An attempt should also be made for each burn units to contain populations of the food plants, nectar sources, or other habitat features needed by the rare insects (Schweitzer, 1985). Where these features are concentrated within just one part of a preserve, that area should be handled with special precautions, such as wetting down the areas of critical importance to the insects (Schweitzer, 1985).

A second recommendation is to allow sufficient time for colonists to spread out from the unburned refugia (Swengel, 1991; Schweitzer, 1992). Burned areas adjoining a refugium may take a year or more to successfully colonize -- Swengel finds that even three years is not enough in northern prairie preserves (pers. com. to Schweitzer) -- and should not be re-burned until they can serve as significant recolonization sources themselves. Ideally, adjacent units should not be burned in successive years.

Note that this automatically imposes at least a four year rotation between burns where only two units are involved, as at Myrtle Head Savanna. Where the preserve is evenly divided into three

units, a compromise might be possible reducing the rotation to three years: even though one unit adjoining a burned area is burned in the following year, a second unburned unit still exists to supply colonists to the first recovering unit.

Again, specific information concerning population size and health should be used to modify the rotation schedule. In years where a population has been knocked back by poor weather or heavy parasitization, for instance, a longer period of time may be necessary for successful colonization to occur (Swengel, pers. comm.; Schweitzer, 1992). Adherence to a fixed burn schedule in such cases could prove catastrophic.

The principles just discussed apply to large reserves as well as to small. Many of the rarest species occur in just a small fraction of the available habitat, and protection of refugia and allowance for recolonization time should be given consideration in preserves even as large as the Green Swamp. With respect to that particular refuge, for instance, we strongly recommend that the past policy of burning all the roadside savannas every year be abandoned for a more ecologically sound rotation schedule. The Big and Little Island Savannas in particular serve as recolonization sources for one another and should never be burned in the same year, nor even in consecutive years.

Large preserves have certain advantages not found in smaller ones, however. They can support larger populations, greater habitat heterogeneity, and a higher degree of species diversity, all of which can contribute to ecological stability. From the point of view of insect conservation, large preserves are also more likely to contain sufficient numbers of separate sub-populations to make a metapopulational structure viable within their boundaries.

Large or small, increasing the amount of natural habitat contained within a preserve is usually a good idea. With respect to the four reserves we studied, we recommend a high priority be placed on acquiring more habitat in the area surrounding the Lanier Quarry Savanna. Remnant savannas are scattered throughout a 400 acre tract of uninhabited land surrounding the small TNC parcel; these sites could all be quickly restored or linked together through the judicious use prescribed burning. Such acquisition may be absolutely critical to the preservation of the distinctive insect fauna we have documented there.

At the Green Swamp and Angola Creek, the emphasis should be placed on creating more savanna and flatwoods habitat through burning areas now occupied by pine plantation or invading hardwoods -- these areas should definitely not be sold off! This follows a final recommendation with regard to prescribed burns: place a higher priority on burning and thus restoring the most degraded areas within a preserve rather than on burning the most pristine. Badly altered sites probably contain the fewest number of significant species and through their restoration will offer more latitude in managing the higher quality sites. In this context, acquiring even such badly damaged habitat as the clearcut and site-prepped sites adjacent to Myrtle Head Savanna should be seen as a long-term investment.

Monitoring and Research Needs

We believe we have accomplished our original goals, which were to demonstrate the significance of the insect fauna of the savannas and flatwoods of the southeastern North Carolina Coastal Plain, and to formulate management strategies for their conservation. There is obviously more to be learned, however. We have four main suggestions in this regard.

1. Continue the inventory. We worked with only three groups of insects and even within those groups a monthly sampling of only a few sites in each preserve cannot be regarded as producing a full inventory of the species present. More intensive sampling would greatly increase the overall number of species as well as augment the number of rarities known to occur in the preserves. At two sites near the Croatan National Forest, for instance, J.B. Sullivan has observed nightly changes in species composition within the moths coming to his traps. Some of the rarest species, including several that are yet undescribed, were taken on only one or two nights out of several years of near nightly sampling (Sullivan, pers. comm.). Given the significance of what we did manage to collect, a ongoing survey similar to Dr. Sullivan's certainly appears warranted for the four preserves we investigated. Ideally, the survey should be expanded to cover other groups of invertebrates, particularly those at risk from fire.

2. Obtain life history information on the most significant species. Mark-recapture studies, such as those conducted by Arnold on six endangered Californian butterflies (Arnold, 1983), produce valuable stewardship information regarding population size, recruitment, and vagility (these methods may be difficult to apply to nocturnal species, however). Detailed behavioral observations can also help clarify dispersal abilities, fire survival, and recolonization time in selected species, as well as reveal other management concerns.

3. Monitor population levels. For the rarest species, regular monitoring of population size and health should be used to determine when the best times exist to conduct prescribed burns or other active management. As mentioned above, burning should be avoided when population cycles reach a low point due to predation, poor weather conditions, or simply random fluctuation.

4. Monitor the effects of fire. The unplanned experiment at Myrtle Head should be repeated under more conventional circumstances. These should include assessing both population levels and species composition before a burn and for a series of sampling intervals afterwards. The use of control plots should also be employed to assess the influence of weather and other factors.

Conclusions

The fire-maintained communities of southeastern Coastal Plain of North Carolina contain a unique assemblage of plants and animals, including a number of highly distinctive insect species. The Nature Conservancy, with its goal to maintain examples of intact, functioning ecosystems, plays a key role in protecting these communities but may need to modify its management tactics to take insects and other invertebrates more into account. Old assumptions that whatever is good for the plants and vertebrates of a community will automatically be good for the rest of the species have been shown to be invalid. Conversely, basing conservation plans on the needs of the lepidoptera and other invertebrates may also benefit many vertebrates or even plants as well -- any that depend on small scale habitat heterogeneity or on metapopulations for survival.

Management plans should now take into account the highly specific habitat needs of at least the most significant invertebrates occurring within a preserve. Special attention should be given to the role played by a widely distributed set of sub-populations -- i.e., a metapopulation -- in the survival of these species. Ongoing inventory and monitoring should help identify the most successful forms of management, including modifications to current burn prescriptions. Successful management of the TNC preserves in North Carolina Coastal Plain will provide valuable models that can be adopted by state parks, gamelands, National Forests and Wildlife Refuges, and other public and private preserves.

REFERENCES

Andrewartha, H.G. and Birch, L.C. 1954. The Distribution and Abundance of Animals. Univ. Chicago Press; Chicago

Arnold, R.A. 1983. Ecological studies of six endangered butterflies (Lepidoptera, Lycaenidae): island biogeography, patch dynamics, and the design of habitat preserves. Univ. Cal. Press; Berkeley

Blatchley, W.S. 1920. The Orthoptera of Northeastern America with Especial Reference to the Faunas of Indiana and Florida. The Nature Publ. Co; Indianapolis.

Brimley, C.S. 1938. The Insects of North Carolina. NC. Dept. of Agriculture; Raleigh.

Brown, V.K. 1983. Grasshoppers. Cambridge Univ. Press; Cambridge.

Butler, L. and Kondo, V. 1991. Macrolepidopterous moths collected by blacklight trap at Cooper's Rock State Forest, West Virginia: a baseline study. Bull. Agric. and For. Exp. Station, W. Va. Univ. 705:1-25.

Cancelado, R. and Yonke, T.R. 1985. Effect of prairie burning on insect populations. J. Kans. Entomol. Soc. 43:274-281.

Cappuccino, N. and Kareiva, P. 1985. Coping with a capricious environment: a population study of a rare pierid butterfly. Ecology 66:152-161.

Covell, C.V. Jr. 1984. A Field Guide to the Moths of Eastern North America. Houghton Mifflin Co.; Boston.

Dakin, M.E. and Hays, K.L. 1970. A synopsis of Orthoptera (*sensu lato*) of Alabama. Auburn Univ. Agric. Exper. Station, Bull 404.

Dana, R.P. 1991. Conservation management of the prairie skippers *Hesperia dacotae* and *H. ottoe*: basic biology and threat of mortality during prescribed spring burns. Univ. Minn. Agric. Exp. Stat. Bull 594-1991:1-63.

Dobkin, D.S.; Olivieri, I; and Ehrlich, P.R. 1987. Rainfall and the interaction of microclimate with larval resources in the population dynamics of checkerspot butterflies (Euphydryas editha) inhabiting serpentine grasslands. Oecologia 71:161-166.

Ehrlich, P.R. 1961. Intrinsic barriers to dispersal in the checkerspot butterfly. Science 134:109-109.

Ehrlich, P.R. and Murphy, D.D. 1987. Conservation lessons from long-term studies of checkerspot butterflies. Cons. Biol. 1:122-131.

Ferguson, D.C. 1985. Contributions toward reclassification of the world genera of the tribe Arctiini, Part 1 -- Introduction and a revision of the *Neoarctia-Grammia* group (Lepidoptera: Arctiidae, Arctiinae). Entomography 3:181-275.

Ferguson, D.C. 1982. A revision of the genus Macrochilo Hubner (Lepidoptera: Noctuidae). Entomography 1:303-332.

Ferguson, D.C. 1987. New species and new nomenclature in American Acronictinae (Lepidoptera: Noctuidae). J. Res. Lepid. 26:201-218.

Ferguson, D.C. 1993. A revision of the species of *Nematocampa* (Geometridae: Ennominae) occurring in the United States and Canada. J. Lep. Soc. 47:60-77.

Ferguson, D.C. 1969. A revision of the moths of the subfamily Geometrinae of America north of Mexico (Insecta, Lepidoptera). Peabody Mus. of Nat. Hist. Bull. 29:1-251.

Gilbert, L.E. and Singer, M.C. 1975. Butterfly ecology. Ann. Rev. Ecol. Syst. 6:365-397.

Hall, S.P. 1993. A rangewide status survey of Saint Francis's satyr *Neonympha mitchellii francisci* (Lepidoptera: Nymphalidae). Rep. to US Fish and Wildl. Ser. Reg. 6 End. Species Off.; 330 Ridgefield Court, Asheville, NC.

Harrison, S.; Murphy, D.D.; and Ehrlich, P.R. 1988. Distribution of the Bay checkerspot butterfly, *Euphydryas editha bayensis*: evidence for a metapopulation model. Am. Nat. 132:360-382.

Helfer, J.R. 1987. How to Know the Grasshoppers, Crickets, Cockroaches, and their Allies. Dover Publ. Inc.; NY.

Hodges, R.W., et al. 1983. Check List of the Lepidoptera of North America North of Mexico. E. W. Classey Ltd. and the Wedge Entomological Research Foundation; London.

Howe, W.H. 1975. The Butterflies of North America. Doubleday and Co.; New York.

Jennings, R.H. 1989. Analysis of natural fire regimes of the North Carolina coastal plain. Masters thesis, School of Forestry and Environmental Studies, Duke University; Durham, NC.

Jones, F.M. 1904. Pitcher plant insects. Entom. News 15:14-17.

Jones, F.M. 1907. Pitcher plant insects -- II. Entom. News 18:413-420.

Jones, F.M. 1921. Pitcher plants and their moths. Nat. Hist. 21:296-316.

Lafontaine, J.D. and Poole, R.W. 1991. Noctuoidea: Noctuidae, Plusiinae. Moths of N. America, Fascicle 25.1:1-182.

McCabe, T.L. 1991. Atlas of Adirondack caterpillars. N.Y. St. Mus. Bull. 470:1-112.

Miller, L.D. and Brown, F.M. 1981. A Catalogue/Checklist of the Butterflies of America North of Mexico. The Lepidopterists' Society Memoir 2:1-280.

Minno, M.C. 1992. Lepidoptera of the Archbold Biological Station, Highlands County, Florida. Fla. Ent. 75:297-329.

Moore, J. and Lynch, M. 1991. The endangered longleaf pine forest of the Southeast. NC Wild Flower Pres. Soc. Newsletter 3:18-19.

Murphy, D.D.; Freas, K.E.; and Weiss, S.B. 1990. An environment-metapopulation approach to population viability analysis for a threatened invertebrate. Cons. Biol. 4:41-51.

Murphy, D.D. and Weiss, S.B. 1988. Ecological studies and the conservation of the Bay checkerspot butterfly, *Euphydyras editha bayensis*. Biol. Cons. 46:183-200.

Murphy, D.D. and Wilcox, B.A. 1986. Butterfly diversity in natural habitat fragments: a test of the validity of vertebrate-based management. In: Venner, J.; Morrison, M.L.; Ralph, C.J.; and Barrett, R.H. (eds.) Modeling Habitat Relationships of Terrestrial Vertebrates. Univ. of Wisconsin Press; Madison.

Nagel, H.G. 1973. Effect of spring prairie burning on herbivourous and non-herbivorous arthropod populations. J. Kans. Entomol. Soc. 46:485-496.

New, T.R. 1991. Butterfly Conservation. Oxford Univ. Press; Oxford.

Noss, R.F. 1989. Longleaf pine and wiregrass: keystone components of an endangered ecosystem. Nat. Areas Jour. 9:211-213.

Opler, P.A. 1981. Management of prairie habitats of insect conservation. J. Nat. Areas Assoc. 1:3-6.

Opler, P.A. 1983. County atlas of eastern Unites States butterflies (1840-1982). US Fish and Wildl. Serv.; Washington, D.C.

Opler, P.A. and Krizec, G.O. 1984. Butterflies East of the Great Plains. Johns Hopkins Univ. Press; Baltimore.

Opler, P.A. and Malikul, V. 1992. A Field Guide to Eastern Butterflies. Peterson Field Guide Series. Houghton Mifflin Co; Boston.

Otte, D. 1979. Descriptions of new North American Gomphocerine grasshoppers (Gomphocerinae: Acrididae). Proc. Acad. Nat. Sci. Phila. 131:231-243.

Otte, D. 1981. The North American Grasshoppers. Vol. I: Acrididae -- Gomphocerinae and Acridinae. Harvard Univ. Press; Cambridge.

Panzer, R. 1988. Managing prairie remnants for insect conservation. Natural Areas Journal 8:83-90.

Panzer, R. 1991. Prairie and savanna-restricted insects of the Chicago region. Bull. Ill. Nat. Hist. Survey 34:392. (Abstract).

Parshall, D.K. and Kral, T.W. 1989. A new subspecies of *Neonympha mitchellii* (French) (Satyridae) from North Carolina. J. Lep. Soc. 43:114-119.

Pickett, S.T.A. and Thompson, J.N. 1978. Patch dynamics and the design of nature reserves. Biol. Cons. 13:27-37.

Pollard, E. 1977. A method for assessing changes in the abundance of butterflies. Biol. Cons. 12:115-134.

Profant, D. 1989. The lepidoptera of a central Florida sand pine scrub community. J. Res. Lep. 28:37-74.

Pyle, R; Bentzien, M; and Opler, P. 1981. Insect conservation. Ann. Rev. Entomology 26:233-258.

Rehn, J.A.G. and Hebard, M. 1910. Preliminary studies of North Carolina Orthoptera. Proc. Nat. Acad. Sci. Philad. 62:615-650.

Rehn, J.A.G. and Hebard, M. 1916. Studies in the Dermaptera and Orthoptera of the Coastal Plain and Piedmont Region of the Southeastern United States. Proc. Nat. Acad. Sci. Philad. 68:87-314.

Richards, A.G. 1942. A revision of the species of *Gabara* of the eastern United States (Lepidoptera: Phalaenidae). Trans. Amer. Ent. Soc. 48:1-10.

Rings, R.; Metzler, E.H.; Arnold, F.J.; and Harris, D.H. 1992. The Owlet Moths of Ohio. Bull. Ohio Biol. Survey 9:1-219.

Robbins, L.E. and Myers, R.L. 1989. Seasonal effects of prescribed burning in Florida: a review. Report to the Fla. Game and Fresh Water Fish Comm.

Rome, A. 1987. Fire management plan for Lanier Quarry Savanna Natural Area, Pender County, NC. Report to NC Nature Conservancy; Carrboro, NC.

Sargent, T.D. 1976. Legion of the Night: the Underwing Moths. Univ. Mass. Press: Amherst.

Schafale, M.P. and Weakley, A.S. 1990. Classification of the Natural Communities of North Carolina; Third Approximation. NC Natural Heritage Program, Division of Parks and Recreation; Raleigh, NC.

Schweitzer, D. 1982. Field observations of foodplant overlap among sympatric species of *Catocala* feeding on Juglandaceae. J. Lep. Soc. 36:256-263.

Schweitzer, D. 1983. A new species of *Spartiniphaga* (Noctuidae) from the New Jersey Pine Barrens. J. Lep. Soc. 37:301-305.

Schweitzer, D. 1985. Effects of prescribed burning on rare Lepidoptera. Memo to TNC stewardship and heritage staffs, eastern and midwestern regions. The Nature Conservancy; Boston

Schweitzer, D. 1989. A review of Category 2 Insecta in USFWS Regions 3, 4, and 5. Report to the US Fish and Wildlife Service. Newton Corners, MA.

Schweitzer, D. 1992. *Speyeria idalia*, the regal fritillary. Results of a global status survey. Report to US Fish and Wildlife Service; One Gateway Center, Suite 700, Newton Corner, MA.

Schweitzer, D. and Rawinski, T. 1988. Element Stewardship Abstract: Northeastern Pitch Pine-Scrub Oak Barrens. Rep. to The Nature Conservancy.

Scott, J.A. 1986. The Butterflies of North America; a Natural History and Field Guide. Stanford Univ. Press; Stanford.

Sharp, M.A.; Parks, D.R.; and Ehrlich, P.R. 1974. Plant resources and butterfly habitat selection. Ecology 55:870-875.

Singer, M.C. 1972. Complex components of habitat suitability within a butterfly colony. Science 176:75-77.

Stolzenburg, W. 1992. Silent sirens. Nature Conservancy 42(3): 8-13.

Swengel, A.B. 1991. Occurrence and behavior of the regal fritillary and prairie skippers in the Upper Midwest, 1990-1991 research. Report to the Wisconsin Nature Conservancy; Madison.

Thomas, J.A. 1983. A quick method for estimating butterfly numbers during surveys. Biol. Cons. 27:195-211.

Vickery, V.R. and Kevan, D.K. McE. 1989. A Monograph of the Orthopteroid Insects of Canada and Adjacent Regions. Lyman Ent. Mus. and Res. Lab. Memoir 13.

Ware, S.; Frost, C.C; and Doerr, P. 1992. Southern mixed hardwood forest (the former longleaf pine forest). In W.H. Martin (ed.). Biotic Communities of the Southeastern United States. Vol. 1, Terrestrial Communities. John Wiley and Sons, N.Y.

Weakley, A.S. and Moore, J.H. 1989. The discovery of Myrtle Head Savanna. Report to NC Natural Heritage Program.

Whitehead, D.R. 1964. Fossil pine pollen and full-glacial vegetation in southeastern North Carolina. Ecology 45:767-777.

Whitehead, D.R. 1981. Late Pleistocene vegetational changes in northeastern North Carolina. Ecol. Monog. 51:451-471.

Wray, D.L. 1967. Insects of North Carolina. Third Supplement. NC Dept. of Agric.; Raleigh.

Table 1. **Taxonomic Groups Represented in the Results**

Taxon	Combined Sites	Sites			
		Angola Creek Flatwoods	Green Swamp (all sites)	Lanier Quarry Savanna	Myrtle Head Savanna
Macro-moths	409	248	216	261	229
Thyartiridae	1	0	0	1	0
Drepanidae	1	0	0	1	0
Geometridae	85	51	50	49	52
Mimallonidae	1	1	1	1	1
Apatelodidae	1	1	0	0	1
Lasiocampidae	4	2	2	3	3
Saturniidae	11	7	5	8	9
Sphingidae	14	5	4	7	13
Notodontidae	23	13	5	17	12
Arctiidae	35	22	22	27	21
Lymantriidae	7	6	5	5	3
Noctuidae	226	140	122	142	114
Butterflies	53	16	31	37	35
Papilionidae	5	5	2	3	3
Pieridae	4	4	3	3	3
Lycaenidae	5	1	4	2	4
Riodinidae	1	1	1	1	1
Nymphalidae	11	3	5	9	9
Hesperiidae	27	2	16	19	15
Grasshoppers	25	11	15	17	17
Gomphocerinae	7	3	5	6	5
Oedopodinae	8	5	4	4	5
Melanoplinae	7	1	3	5	5
Cyrtacanthicridinae	3	2	3	2	2
Totals	487	275	262	315	281

Table 2. Species Breakdown by Habitat Categories

Taxon	Combined Sites	Angola Creek Flatwoods	Green Swamp	Lanier Quarry Savanna	Myrtle Head Savanna
MACRO-MOTHS					
0. Unknown habitats	35	16	16	17	14
1. Hardwoods, pines, and fields (generalists)	119	80	70	76	72
2. Croplands plus other open areas	21	12	11	14	14
3. General open areas (non-agricultural)	38	18	20	21	23
4. Grassy areas -- general	9	7	4	5	8
5. Hardwood forests and shrub thickets -- general	107	60	40	68	48
SUBTOTAL -- EXTRANEOUS HABITATS	329	193	161	201	179
6. Pocosins and other shrubby wetlands	12 (9)*	9 (8)	8 (3)	8 (7)	6 (5)
7. Pine and other conifer forests (conifer feeders)	19 (4)	12 (2)	15 (3)	12 (3)	12 (2)
8. Flatwoods and heath barrens	13 (9)	9 (7)	10 (6)	8 (6)	8 (4)
9. Wet savannas, bogs, and other wet swales	20 (20)	13 (13)	11 (9)	16 (16)	12 (11)
10. Marshes, swamps, and riparian habitats	16	8	5	9	6
SUBTOTAL -- COASTAL PLAIN HABITATS	80 (42)	51 (30)	49 (21)	53 (32)	44 (22)

* Numbers of distinctive species are given in parentheses (see Table 3)

Taxon	Combined Sites	Angola Creek Flatwoods	Green Swamp (all sites)	Lanier Quarry Savanna	Myrtle Head Savanna
BUTTERFLIES					
0. Unknown habitats	0	0	0	0	0
1. Hardwoods, pines, and fields (generalists)	5	4	4	4	4
2. Croplands plus other open areas	1	1	0	0	0
3. General open areas (non-agricultural)	21	4	12	16	17
4. Grassy areas -- general	5	0	3	4	2
5. Hardwood forests and shrub thickets -- general	5	4	2	4	3
SUBTOTAL -- EXTRANEOUS HABITATS	37	13	21	28	26
6. Pocosins and other shrubby wetlands	3 (3)	1 (1)	3 (3)	1 (1)	0 (0)
7. Pine and other conifer forests (conifer feeders)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
8. Flatwoods and heath barrens	2 (1)	1 (1)	2 (1)	1 (1)	1 (1)
9. Wet savannas, bogs, and other wet swales	5 (5)	0 (0)	2 (2)	3 (3)	4 (4)
10. Marshes, swamps, and riparian habitats	6	0	3	4	4
SUBTOTAL -- COASTAL PLAIN HABITATS	16 (9)	2 (2)	10 (6)	9 (5)	9 (5)

Taxon	Combined Sites	Angola Creek Flatwoods	Green Swamp (all sites)	Lanier Quarry Savanna	Myrtle Head Savanna
GRASSHOPPERS					
0. Unknown habitats	0	0	0	0	0
1. Hardwoods, pines, and fields (generalists)	7	4	4	4	3
2. Croplands plus other open areas	0	0	0	0	0
3. General open areas (non-agricultural)	7	4	4	5	7
4. Grassy areas -- general	1	0	1	1	1
5. Hardwood forests and shrub thickets -- general	0	0	0	0	0
SUBTOTAL -- EXTRANEOUS HABITATS	15	8	9	10	11
6. Pocosins and other shrubby wetlands	3 (2)	0 (0)	1 (0)	2 (1)	3 (2)
7. Pine and other conifer forests (conifer feeders)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
8. Flatwoods and heath barrens	1 (1)	1 (1)	1 (1)	0 (0)	0 (0)
9. Wet savannas, bogs, and other wet swales	5 (5)	2 (2)	4 (4)	4 (4)	2 (2)
10. Marshes, swamps, and riparian habitats	1	0	0	0	1
SUBTOTAL -- COASTAL PLAIN HABITATS	10 (8)	3 (2)	6 (5)	6 (5)	6 (4)

Table 3. Distinctive Insect Species of the Savannas, Flatwoods, and Pocosins

SAVANNAS (BOGS AND WET SWALES)		
Species	**Distribution**	**Host Plants**
MACRO-MOTHS		
Acronicta sinescripta	S: NC->south	Unknown
Amolita fessa	E:	Poaceae
Amolita roseola	E:	Graminoids?
Amolita obliqua	S: NC->south	Poaceae?
Argyrostrotis deleta	S: NC->south	Unknown
Argyrostrotis erasa	S: NC->south	Unknown
Doryodes n. sp.	S:	Poaceae
Euagrotis lubricans	S: NC->FL (& Ohio)	Unknown
Exyra fax (=rolandiana)	N: ME->NC	Sarracenia purpurea
Exyra ridingsii (= nigrocaput)	S: NC->south	Sarracenia flava
Gabara distema humeralis	S: NC->south	Graminoids?
Gabara pulverosalis	S/CP: NJ->south	Graminoids?
Hemipachnobia s. subporphyrea	S: NC	Dionaea muscipula
Hypenodes fractilinea?	N: N.S.->neVA (& FL)	Unknown
Lithacodia bellicula	E:	Carex?
Macrochilo hypocritalis	E:	Carex?
Macrochilo louisiana	E:	Carex?
Papaipema appassionata	E:	Sarracenia
Scopula purata	E/CP: NH->FL	Unknown
Spartiniphaga carterae	S: NJ & NC	Calamovilfa brevipilis
BUTTERFLIES		
Amblyscirtes alternata	S: NC->TX	Unknown
Euphyes dion	E:	Cyperaceae, Scirpus cyperinus, Carex lacustris, C. stricta, C. hyalinolepis,
Neonympha areolata	S: NJ->TX	Graminoids
Oligoria maculata	S: NC->south (& NJ)	Poaceeae
Problema byssus	S: NC-> (& Midwest)	Tripsacum dactyloides

SAVANNAS (BOGS AND WET SWALES)		
Species	**Distribution**	**Host Plants**
GRASSHOPPERS		
Dichromorpha elegans	General	Graminoids, Forbs
Melanoplus decorus	S: NC (New Bern->S)	Graminoids, Forbs
Melanoplus femurrubrum propinquus	S/CP: NC->	Graminoids, Forbs
Mermiria picta	S: VA->	Graminoids, Forbs
Stethophyma celata	N: MA-SC (& Midwest)	Cyperaceae?

PINE FLATWOODS (AND HEATH BARRENS)		
Species	**Distribution**	**Host Plants**
MACRO-MOTHS		
Glena cognataria	E/CP: N.S.->FL	Vaccinium
Pero zalissaria	S: NJ->FL	Myrica gale?, Baccharis?
Datana major	E:	Rhododendron (azaleas), Lyonia, Leucothoe
Datana ranaeceps	E:	Lyonia, Leucothoe
Catocala praeclara	E:	Aronia, Amelanchier?
Spilosoma dubia	N: (rare in SE, including FL)	Prunus, Plantago -- probably a general feeder
Stenaspilatodes antidiscaria	S: NJ->FL	Unknown (accepts some Ericaceae)
Metarranthus lateritiaria	S/CP: NC->south	Ericaceae?
Agrotis buccholzi	S: NJ & NC	Pyxidanthera barbulata
BUTTERFLIES		
Calephelis virginiensis	S: VA->TX	Cirsium horridulum
GRASSHOPPERS		
Arphia granulata	S: NC->	Graminoids, Forbs

POCOSINS (POND/PITCH PINE LOWLANDS)		
Species	**Distribution**	**Host Plants**
MACRO-MOTHS		
Acronicta lanceolaria	N: New Eng., NJ (& FL?)	Vaccinium, Comptonia peregrina, Rosaceae and other shrubs
Anomogyna youngii?	N: Lab.->NJ	Vaccinium, Myrica, Chamaedaphne, Larix
Callopistria granitosa	S/CP: NJ->FL	Ferns, Woodwardia?
Argyrostrotis flavistriaria	S: NC->south	Cyrilla racemosa?

POCOSINS (POND/PITCH PINE LOWLANDS)		
Species	**Distribution**	**Host Plants**
Argyrostrotis sylvarum	S: NC->south	Lyonia?
Cleora projecta	E/CP:Canada->SC	Gale palustris, Myrica gale, Ericaceae?
Morrisonia n. sp.	S/CP: NC->south	Unknown
Nola clethrae	E: MA->south	Clethra
Papaipema stenoscelis	E:	Woodwardia virginica
BUTTERFLIES		
Amblyscirtes carolina	S: VA->south	Arundinaria
Celastrina argiolus complex	Unk (NJ and NC at least)	Ilex glabra?
Poanes yehl	S: VA->south	Arundinaria
GRASSHOPPERS		
Melanoplus nubilus	S: NC (Fayetteville)	Graminoids, Forbs
Paroxya atlantica	S: NJ->	Graminoids, Forbs

SOUTHEASTERN PINE FORESTS		
Species	**Distribution**	**Host Plants**
MACRO-MOTHS		
Semiothisa distribuaria	S/CP: NC->FL	Pinus (possibly only on palustrus)
Tolype minta	S/CP: SC->south	Pinus
Zale buchholzi	S: NJ->south	Pinus (possibly only on serotina and rigida)
Zale nr. obliqua	S?	Pinus

Table 4. **Natural Heritage Program Element Species**

SPECIES	NC STATUS	US STATUS	NC RANK	GLOBAL RANK
MACRO-MOTHS				
Fire-maintained Communities:				
Acronicta lanceolaria	SR		SU	G4
Acronicta sinescripta	SR		S1S3	G3G4
Agrotis buccholzi	SR	C2	S1S3	G2G3
Anomogyna youngii?	SR		S?	G5
Argyrostrotis erasa	SR		SU	G4
Argyrostrotis deleta	SR		SU	G4
Cleora projecta	SR		SU	G4
Doryodes n. sp.	SR		S2S3	G3G4
Euagrotis lubricans	SR		S3?	G4
Exyra fax	SR		S1S3	G4
Exyra ridingsii	SR		S1S3	G4
Gabara distema	SR		S2S3	G4
Gabara pulverosalis	SR		SU	G4
Hemipachnobia s. subporphyrea	SR		S1S3	G4T1T3
Macrochilo louisiana	SR		SU	G4
Metarranthus lateritiaria	SR		S1S3	G3G4
Morrisonia n. sp.	SR		SU	G3G4
Papaipema appassionata	SR		SU	G4
Scopula purata	SR		S2S3	G4
Spartiniphaga carterae	SR	C2	S2S3	G2G3
Spilosoma dubia	SR		S1S3	G4
Hardwoods:				
Dasychira atrivenosa	SR		SU	G4
Idaea violacearia	SR		SU	G4
Unknown Habitats:				
Nematocampa baggettaria	SR		SU	G3G4
BUTTERFLIES				
Fire-maintained Communities:				
Amblyscirtes alternata	SR		S2?	G3G4
Calephelis virginiensis	SR		S3?	G4
*Problema byssus**	SR		S2?	G3G4
*Amblyscirtes reversa**	SR		S3?	G4

SPECIES	NC STATUS	US STATUS	NC RANK	GLOBAL RANK
*Atrytone arogos arogos**	SR	C2	S1	G4T1T2
*Atrytonopsis loammi**	SR		S1	GUQ
*Euphyes berryi**	SR		S1	G3G4
*Euphyes bimacula**	SR		S2?	G4
*Hesperia attalus slossonae**	SR		S1S3	G4T3
*Incisalia irus**	SR		S3?	G4
GRASSHOPPERS				
Fire-maintained Communities:				
Melanoplus nubilus	SR		S1S3	GU
Melanoplus decorus	SR		S1S3	GU
Stethophyma celata	SR		S1S3	G2T1Q

* Species not recorded in the present survey but known to occur in North Carolina in habitats similar to those of our study areas

Table 5. Number of Element Species within the Preserves

Combined Sites	Angola Creek Flatwoods	Green Swamp (all sites)	Lanier Quarry Savanna	Myrtle Head Savanna
MACRO-MOTHS				
24	16	16	16	13
BUTTERFLIES				
2*	1	2	1	1
GRASSHOPPERS				
3	0	1	2	2
TOTALS				
29	17	19	19	16

* Only the species actually encountered during the survey are included

Table 6. Differences in Number of Individuals and Species Between Samples

Wet Savanna Habitats				
Date	Counts	Myrtle Head Savanna		Lanier Quarry Savanna
		Site 1 (burned)	Site 2 (unburned)	
12,13 April 1991*	# Species	24 (6)**		59 (13)
	# Individuals	47 (15)		159 (32)
8,9 May 1991	# Species	62 (8)		91 (13)
	# Individuals	231 (45)		369 (71)
10,11 June 1991	# Species	33 (9)		47 (11)
	# Individuals	115 (34)		147 (23)
10, 11, July 1991	# Species	54 (5)	77 (7)	58 (10)
	# Individuals	141 (51)	232 (36)	232 (29)
5,6 August 1991	# Species			59 (9)
	# Individuals			244 (40)
9, 10 Sept. 1991	# Species	43 (7)	44 (5)	34 (6)
	# Individuals	101 (22)	127 (16)	166 (30)
9, 10 October 1991	# Species	20 (4)	17 (3)	23 (5)
	# Individuals	68 (13)	30 (11)	52 (14)
4 May 1992	# Species	21 (5)	8 (0)	
	# Individuals	33 (8)	11 (0)	
24 June 1992	# Species	35 (10	43 (10)	
	# Individuals	105 (40)	109 (20)	
1 Sept. 1992	# Species	39 (5)	8 (0)	
	# Individuals	51 (6)	46 (0)	

* The first date in each case refers to samples from Myrtle Head Savanna, the second from Lanier Quarry Savanna
** Numbers in parenthesis refer to the distinctive species listed in Table 3

Flatwoods Habitats				
Date	Counts	Angola Creek		Shoestring Island
		Site 1	Site 2	
12,13 April 1991*	# Species	51 (15)		28 (11)
	# Individuals	122 (68)		74 (53)
8,9 May 1991	# Species	85 (8)		48 (9)
	# Individuals	264 (21)		116 (36)
10,11 June 1991	# Species	46 (6)	48 (8)	23 (9)
	# Individuals	117 (15)	111 (25)	37 (21)
10,11 July 1991	# Species	72 (5)	66 (9)	66 (12)
	# Individuals	208 (7)	182 (44)	250 (37)
5,6 August 1991	# Species			
	# Individuals			
9,10 Sept. 1991	# Species	55 (5)	40 (2)	39 (7)
	# Individuals	182 (11)	185 (4)	85 (21)
9, 10 October 1991	# Species	15 (2)	18 (2)	20 (5)
	# Individuals	34 (2)	44 (4)	41 (15)

* First date refers to Shoestring Island, the second to Angola Creek

Table 7. Comparison of Distinctive Species Between Samples

Wet Savanna Habitats			
Date	Myrtle Head Savanna		Lanier Quarry Savanna
	Site 1 (burned)	Site 2 (unburned)	
12,13 April 1991*	Spilosoma dubia (1)** Argyrostrotis erasa (3) Argryostrotis deleta (7)		Spilosoma dubia (1) Argyrostrotis erasa (1) Argryostrotis deleta (4) Morrisonia n. sp. (1) Euagrotis lubricans (3) Hemipachnobia subporphyrea (4) Cleora projecta (1)
8,9 May 1991	Argyrostrotis erasa (3) Argryostrotis deleta (4)		Argyrostrotis erasa (15) Euagrotis lubricans (1) Hemipachnobia subporphyrea (1) Metarranthis lateritiaria (5)
10,11 June 1991	Argyrostrotis erasa (1) Argryostrotis deleta (3) Euagrotis lubricans (4) Morrisonia n. sp. (1)		Argyrostrotis erasa (2) Argryostrotis deleta (3) Euagrotis lubricans (1) Exyra ridingsii (1)
10, 11, July 1991	Argryostrotis deleta (1) Gabara distema (13) Dasychira atrivenosa (1)		Euagrotis lubricans (4) Gabara distema (7) Doryodes n. sp. (1)
5,6 August 1991			Argyrostrotis erasa (1) Argryostrotis deleta (3) Gabara sp. (7) Exyra fax (1)
9, 10 Sept. 1991	Argryostrotis deleta (5) Gabara distema (1) Exyra sp. (1)		Argryostrotis deleta (2) Gabara distema (1) Exyra fax (1)
9, 10 October 1991	Spartiniphagaa carterae (1)		Anomogyna youngii? (6) Doryodes n. sp. (2) Euagrotis lubricans (2) Spartiniphaga carterae (6)
4 May 1992	Argryostrotis erasa (2) Argryostrotis deleta (1) Euagrotis lubricans (1)		
24 June 1992	Argryostrotis erasa (1) Argryostrotis deleta (4) Exyra sp. (1) Gabara distema (3) Doryodes n. sp. (4) Nematocampa baggetaria (1)	Argryostrotis erasa (1) Argryostrotis deleta (4) Exyra sp. (1) Acronicta sinescripta (1)	

1 Sept. 1992	Argryostrotis deleta (2) Euagrotis lubricans (1)		

* The first date in each case refers to samples from Myrtle Head Savanna, the second from Lanier Quarry Savanna
** Numbers in parenthesis refer to the number of individuals recorded

Flatwoods Habitats			
Date	Angola Creek		Shoestring Island
	Site 1	Site 2	
12,13 April 1991*	Acronicta lanceolaria (1) Agrotis buccholzi (7) Argryostrotis erasa (1) Cleora projecta (1) Doryodes n. sp. (1) Euagrotis lubricans (1) Morrisonia n. sp. (2) Spilosoma dubia (1)		Agrotis buccholzi (5) Argyrostrotis erasa (3) Cleora projecta (2) Doryodes n. sp. (11) Spilosoma dubia (3)
8,9 May 1991	Acronicta lanceolaria (1) Agrotis buccholzi (7) Argryostrotis erasa (11) Argryostrotis deleta (4) Cleora projecta (1) Doryodes n. sp. (1) Morrisonia n. sp. (2)		Agrotis buccholzi (4) Argryostrotis erasa (3) Cleora projecta (1) Euagrotis lubricans (1) Gabara distema (1) Metarranthis lateritiaria (2)
10,11 June 1991	Agrotis buccholzi (2) Doryodes n. sp. (4) Gabara pulverosalis (6)	Argryostrotis deleta (3) Argryostrotis erasa (3) Doryodes n. sp. ((1) Gabara pulverosalis (2) Idaea violacearia (2)	Agrotis buccholzi (6) Euagrotis lubricans (1)
10, 11, July 1991	Argryostrotis deleta (1) Argryostrotis erasa (1) Euagrotis lubricans (1) Gabara sp. (5)	Argryostrotis deleta (2) Exyra fax (1) Gabara distema (1) Gabara pulverosalis (32)	Argryostrotis deleta (4) Argryostrotis erasa (3) Euagrotis lubricans (1) Exyra sp. (1) Gabara distema (1) Gabara pulverosalis (5) Gabara sp. (4) Idaea violacearia (1) Morrisonia n. sp. (1) Scopula purata (1)
5,6 August 1991			
9, 10 Sept. 1991	Agrotis buccholzi (1) Dasychira atrivenosa (1) Euagrotis lubricans (3) Gabara distema (2) Gabara sp. (2)	Gabara sp. (11)	Argyrostrotis deleta (2) Euagrotis lubricans (2)

9, 10 October 1991	Anomogyna youngii? (1) Spartiniphaga carterae (1)	Anomogyna youngii? (3)	Anomogyna youngii? (3) Euagrotis lubricans (1) Doryodes n. sp. (4)

* First date refers to Shoestring Island, the second to Angola Creek

APPENDIX A

COLLECTION RECORDS -- SAVANNA SURVEY 1991-1992

Species	Site (Sub-site)	Date	Method[6]	Sample
	MICRO MOTHS			
Thyridopteryx ephemeraeformis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Thyridopteryx ephemeraeformis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Atteva punctella	Lanier Quarry Savanna, -	92-09-01	L	+
Givira francesca?	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Givira sp.	Green Swamp Preserve, Big Island Savanna	92-06-24	S	1
Cossula magnifica	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Prionoxystus robiniae	Myrtle Head Savanna, Site 1	91-05-08	L	1
Choristoneura parallela	Lanier Quarry Savanna, -	92-09-01	L	+
Choristoneura rosaceana	Lanier Quarry Savanna, -	92-09-01	L	+
Harrisina americana	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Lagoa crispata	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Lagoa crispata	Angola Creek Flatwoods, Site 1	91-06-11	L	16
Lagoa crispata	Angola Creek Flatwoods, Site 2	91-06-11	L	31
Lagoa crispata	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	4
Lagoa crispata	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	8
Lagoa crispata	Green Swamp Preserve, Big Island Savanna	92-06-24	O	2
Lagoa crispata	Green Swamp Preserve, Little Island Savanna	92-06-24	O	2
Lagoa crispata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Lagoa crispata	Lanier Quarry Savanna, Big Savanna	91-06-11	L	35
Lagoa crispata	Myrtle Head Savanna, Site 1	91-06-10	L	1
Lagoa crispata	Myrtle Head Savanna, Site 2	92-06-24	L	6
Megalopyge opercularis	Angola Creek Flatwoods, Site 1	91-06-11	L	2
Megalopyge opercularis	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Megalopyge opercularis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Megalopyge opercularis	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Megalopyge opercularis	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Megalopyge opercularis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	14
Megalopyge opercularis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Megalopyge opercularis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	9
Megalopyge opercularis	Myrtle Head Savanna, Site 2	91-07-10	L	2
Megalopyge opercularis	Myrtle Head Savanna, Site 2	92-06-24	L	2
Tortricidia testacea	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Packardia geminata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Lithacodes fasciola	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Lithacodes fasciola	Angola Creek Flatwoods, Site 1	91-07-11	L	16
Lithacodes fasciola	Angola Creek Flatwoods, Site 2	91-07-11	L	8
Lithacodes fasciola	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	17
Lithacodes fasciola	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Lithacodes fasciola	Lanier Quarry Savanna, Big Savanna	91-07-11	L	7
Lithacodes fasciola	Lanier Quarry Savanna, -	92-09-01	L	+
Lithacodes fasciola	Myrtle Head Savanna, Site 1	91-07-10	L	2
Lithacodes fasciola	Myrtle Head Savanna, Site 2	91-07-10	L	20
Prolimacodes badia	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Prolimacodes badia	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Prolimacodes badia	Angola Creek Flatwoods, Site 2	91-07-11	L	3
Prolimacodes badia	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Prolimacodes badia	Mixed, -	91-08-05	L	3
Prolimacodes badia	Myrtle Head Savanna, Site 2	91-07-10	L	1
Natada nasoni	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Natada nasoni	Angola Creek Flatwoods, Site 2	91-07-11	L	1

[6]**L = Light Trap; S = Sheet; B = Bait; D = Daytime Search**

Natada nasoni	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Natada nasoni	Myrtle Head Savanna, Site 1	91-07-10	L	1
Adoneta spinuloides	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Monoleuca semifascia	Angola Creek Flatwoods, Site 1	91-06-11	L	6
Monoleuca semifascia	Angola Creek Flatwoods, Site 2	91-06-11	L	6
Monoleuca semifascia	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Monoleuca semifascia	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Monoleuca semifascia	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Monoleuca semifascia	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Monoleuca semifascia	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Monoleuca semifascia	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Monoleuca semifascia	Lanier Quarry Savanna, Big Savanna	91-06-11	L	6
Monoleuca semifascia	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Monoleuca semifascia	Myrtle Head Savanna, Site 1	91-06-10	L	1
Monoleuca semifascia	Myrtle Head Savanna, Site 1	91-07-10	L	4
Monoleuca semifascia	Myrtle Head Savanna, Site 2	91-07-10	L	6
Euclea delphinii	Angola Creek Flatwoods, Site 1	91-07-11	L	11
Euclea delphinii	Angola Creek Flatwoods, Site 2	91-07-11	L	6
Euclea delphinii	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Euclea delphinii	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Euclea delphinii	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Euclea delphinii	Lanier Quarry Savanna, -	92-09-01	L	+
Euclea delphinii	Mixed, -	91-08-05	L	2
Parasa chloris	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Parasa indetermina	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Parasa indetermina	Lanier Quarry Savanna, Big Savanna	91-07-11	L	4
Parasa indetermina	Myrtle Head Savanna, Site 2	91-07-10	L	1
Sibine stimulea	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Neohelvibotys neohelvialis	Lanier Quarry Savanna, -	92-09-01	L	+
Diacme elealis	Lanier Quarry Savanna, -	92-09-01	L	+
Desmia funeralis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Desmia maculalis	Lanier Quarry Savanna, -	92-09-01	L	+
Herpetogramma theseusalis	Lanier Quarry Savanna, -	92-09-01	L	+
Crambus satrapellus	Lanier Quarry Savanna, -	92-09-01	L	+
Crambus sp.	Green Swamp Preserve, Deer Island Savanna	91-06-11	D	+
Parapediasia decorella	Lanier Quarry Savanna, -	92-09-01	L	+
Argyria nummulalis	Lanier Quarry Savanna, -	92-09-01	L	+
Vaxi auratella	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Eoreuma densella	Lanier Quarry Savanna, -	92-09-01	L	+
Herculia olinalis	Angola Creek Flatwoods, Site 1	91-07-11	L	4
Herculia olinalis	Lanier Quarry Savanna, -	92-09-01	L	+
Tetralopha melanogrammos	Lanier Quarry Savanna, -	92-09-01	L	+
Dioryctria taedae	Lanier Quarry Savanna, -	92-09-01	L	+
Dioryctria taedivorella	Lanier Quarry Savanna, -	92-09-01	L	+
Euzophera sp.	Lanier Quarry Savanna, -	92-09-01	L	+

MACRO MOTHS

Pseudothyatira cymatophoroides	Lanier Quarry Savanna, -	92-09-01	L	2
Oreta rosea	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Eumacaria latiferrugata	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Eumacaria latiferrugata	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Eumacaria latiferrugata	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Eumacaria latiferrugata	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Eumacaria latiferrugata	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Eumacaria latiferrugata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Eumacaria latiferrugata	Myrtle Head Savanna, Site 1	91-05-08	L	3
Eumacaria latiferrugata	Myrtle Head Savanna, Site 1	92-06-24	L	2
Eumacaria latiferrugata	Myrtle Head Savanna, Site 2	92-06-24	L	1
Itame pustularia	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Itame pustularia	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Itame pustularia	Myrtle Head Savanna, Site 2	92-06-24	L	1

Itame varadaria	Lanier Quarry Savanna, -	92-09-01	L	+
Semiothisa aemulataria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Semiothisa aemulataria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Semiothisa aequiferaria	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Semiothisa aequiferaria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Semiothisa distribuaria	Angola Creek Flatwoods, Site 1	91-04-13	L	3
Semiothisa distribuaria	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Semiothisa distribuaria	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Semiothisa distribuaria	Angola Creek Flatwoods, Site 2	91-06-11	L	2
Semiothisa distribuaria	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Semiothisa distribuaria	Angola Creek Flatwoods, Site 2	91-07-11	L	4
Semiothisa distribuaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Semiothisa distribuaria	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	4
Semiothisa distribuaria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Semiothisa distribuaria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Semiothisa distribuaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Semiothisa distribuaria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Semiothisa distribuaria	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Semiothisa distribuaria	Myrtle Head Savanna, Site 1	92-09-02	L	1
Semiothisa transitaria	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Semiothisa transitaria	Angola Creek Flatwoods, Site 1	91-05-09	L	10
Semiothisa transitaria	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Semiothisa transitaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Semiothisa transitaria	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	5
Semiothisa transitaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	4
Semiothisa transitaria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Semiothisa transitaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Semiothisa transitaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	13
Semiothisa transitaria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Semiothisa transitaria	Myrtle Head Savanna, Site 1	91-05-08	L	1
Semiothisa transitaria	Myrtle Head Savanna, Site 1	91-07-10	L	1
Semiothisa transitaria	Myrtle Head Savanna, Site 1	92-06-24	L	1
Semiothisa bicolorata	Angola Creek Flatwoods, Site 1	91-04-13	L	4
Semiothisa bicolorata	Angola Creek Flatwoods, Site 1	91-05-09	L	3
Semiothisa bicolorata	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Semiothisa bicolorata	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Semiothisa bicolorata	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Semiothisa bicolorata	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Semiothisa bicolorata	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Semiothisa bicolorata?	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Semiothisa bicolorata	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Semiothisa bicolorata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	7
Semiothisa bicolorata	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Semiothisa bicolorata	Lanier Quarry Savanna, -	92-09-01	L	+
Semiothisa bicolorata	Myrtle Head Savanna, Site 1	92-06-24	L	2
Semiothisa bicolorata	Myrtle Head Savanna, Site 2	92-06-24	L	4
Semiothisa multilineata	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Semiothisa multilineata	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Semiothisa eremiata	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Semiothisa eremiata	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Semiothisa eremiata	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Semiothisa eremiata	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Semiothisa eremiata	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Semiothisa gnophosaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Semiothisa sp.	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Hypomecis umbrosaria/gnopharia	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Hypomecis umbrosaria/gnopharia	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Hypomecis sp.	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Glenoides texanaria	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Glenoides texanaria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Glenoides texanaria	Lanier Quarry Savanna, -	92-09-01	L	+
Glenoides texanaria	Myrtle Head Savanna, Site 1	91-10-09	L	2

Glena cribrataria	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Glena cribrataria	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Glena cribrataria?	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Glena cribrataria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Glena cribrataria?	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Glena cribrataria	Myrtle Head Savanna, Site 1	91-04-12	L	1
Glena cribrataria	Myrtle Head Savanna, Site 2	92-06-24	L	1
Glena cognataria	Angola Creek Flatwoods, Site 1	91-04-13	L	3
Glena cognataria	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Glena cognataria	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Glena cognataria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	2
Glena cognataria	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Glena cognataria	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Glena cognataria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Glena cognataria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Glena cognataria	Lanier Quarry Savanna, -	92-09-01	L	+
Glena cognataria	Myrtle Head Savanna, Site 1	91-04-12	L	1
Exelis pyrolaria	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Exelis pyrolaria	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Exelis pyrolaria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Exelis pyrolaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Exelis pyrolaria	Lanier Quarry Savanna, -	92-09-01	L	+
Exelis pyrolaria	Myrtle Head Savanna, Site 1	92-05-04	L	1
Exelis pyrolaria	Myrtle Head Savanna, Site 2	92-06-24	L	1
Tornos scolopacinarius	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Tornos scolopacinarius	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Tornos scolopacinarius	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Tornos scolopacinarius	Lanier Quarry Savanna, Big Savanna	91-04-13	L	3
Tornos scolopacinarius	Myrtle Head Savanna, Site 1	91-04-12	L	3
Tornos scolopacinarius	Myrtle Head Savanna, Site 1	91-06-10	L	2
Tornos scolopacinarius	Myrtle Head Savanna, Site 1	92-05-04	L	2
Tornos sp.	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Tornos sp.	Myrtle Head Savanna, Site 2	91-07-10	L	1
Anacamptodes vellivolata	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Anacamptodes vellivolata	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Anacamptodes vellivolata	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Anacamptodes humaria	Myrtle Head Savanna, Site 1	91-04-12	L	1
Anacamptodes defectaria	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Anacamptodes defectaria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Anacamptodes defectaria	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Anacamptodes defectaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Anacamptodes defectaria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Anavitrinelia pampinaria	Angola Creek Flatwoods, Site 1	91-04-13	L	6
Anavitrinelia pampinaria	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Anavitrinelia pampinaria	Angola Creek Flatwoods, Site 1	91-06-11	L	14
Anavitrinelia pampinaria	Angola Creek Flatwoods, Site 2	91-06-11	L	5
Anavitrinelia pampinaria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Anavitrinelia pampinaria	Angola Creek Flatwoods, Site 2	91-07-11	L	4
Anavitrinelia pampinaria	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Anavitrinelia pampinaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Anavitrinelia pampinaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Anavitrinelia pampinaria	Lanier Quarry Savanna, -	92-09-01	L	+
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 1	91-04-12	L	1
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 1	91-06-10	L	1
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 1	91-07-10	L	1
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 1	91-09-09	L	1
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 2	91-09-09	L	2
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 2	92-06-24	L	1
Anavitrinelia pampinaria	Myrtle Head Savanna, Site 1	92-09-02	L	1
Cleora projecta	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Cleora projecta	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	2

Cleora projecta?	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Cleora projecta	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Ectropis crepuscularia	Lanier Quarry Savanna, -	92-09-01	L	+
Ectropis crepuscularia	Myrtle Head Savanna, Site 1	92-06-24	L	1
Protoboarmia porcelaria	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Protoboarmia porcelaria	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Protoboarmia porcelaria	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Protoboarmia porcelaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Protoboarmia porcelaria	Myrtle Head Savanna, Site 1	91-10-09	L	1
Protoboarmia porcelaria	Myrtle Head Savanna, Site 2	91-10-09	L	1
Epimecis hortaria	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Epimecis hortaria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Epimecis hortaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Epimecis hortaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Epimecis hortaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Epimecis hortaria	Green Swamp Preserve, Big Island Savanna	92-05-04	S	+
Epimecis hortaria	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Epimecis hortaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Epimecis hortaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Epimecis hortaria	Lanier Quarry Savanna, Big Savanna	91-09-10		1
Epimecis hortaria	Lanier Quarry Savanna, -	92-09-01	L	+
Epimecis hortaria	Myrtle Head Savanna, Site 1	91-05-08	L	1
Epimecis hortaria	Myrtle Head Savanna, Site 1	91-07-10	L	2
Epimecis hortaria	Myrtle Head Savanna, Site 2	91-07-10	L	4
Epimecis hortaria	Myrtle Head Savanna, Site 2	91-08-05	O	1
Epimecis hortaria	Myrtle Head Savanna, Site 2	92-05-04	L	1
Melanolophia canadaria	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Melanolophia canadaria	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Melanolophia canadaria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Melanolophia canadaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	4
Melanolophia canadaria	Lanier Quarry Savanna, -	92-09-01	L	+
Melanolophia canadaria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Melanolophia canadaria	Myrtle Head Savanna, Site 2	92-06-24	L	1
Melanolophia signataria?	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Lycia ypsilon	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	2
Hypagyrtis unipunctata?	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Hypagyrtis unipunctata	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Hypagyrtis unipunctata	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Hypagyrtis unipunctata	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Hypagyrtis unipunctata?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Hypagyrtis unipunctata	Lanier Quarry Savanna, -	92-09-01	L	+
Hypagyrtis unipunctata	Myrtle Head Savanna, Site 2	92-06-24	L	1
Hypagyrtis esther	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Hypagyrtis esther	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Hypagyrtis esther	Angola Creek Flatwoods, Site 2	91-07-11	L	6
Hypagyrtis esther	Angola Creek Flatwoods, Site 1	91-09-10	L	4
Hypagyrtis esther	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Hypagyrtis esther	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Hypagyrtis esther	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	3
Hypagyrtis esther	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	6
Hypagyrtis esther	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	5
Hypagyrtis esther	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Hypagyrtis esther	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Hypagyrtis esther	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Hypagyrtis esther	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Hypagyrtis esther	Lanier Quarry Savanna, Big Savanna	91-07-11	L	3
Hypagyrtis esther	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Hypagyrtis esther	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Hypagyrtis esther	Lanier Quarry Savanna, -	92-09-01	L	+
Hypagyrtis esther	Myrtle Head Savanna, Site 1	91-05-08	L	1
Hypagyrtis esther	Myrtle Head Savanna, Site 1	91-09-09	L	1
Hypagyrtis esther	Myrtle Head Savanna, Site 2	91-09-09	L	5

Lomographa vestaliata	Lanier Quarry Savanna, -	92-09-01	L	+
Erastria cruentaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	D	1
Erastria cruentaria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Thysanopyga intractata	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Thysanopyga intractata	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Episemasia solitaria	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Episemasia solitaria	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Episemasia solitaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Episemasia solitaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	3
Episemasia solitaria	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Episemasia solitaria	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	2
Episemasia solitaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Episemasia solitaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	8
Episemasia solitaria	Myrtle Head Savanna, Site 1	91-05-08	L	2
Episemasia solitaria	Myrtle Head Savanna, Site 1	91-07-10	L	1
Euchlaena obtusaria (of Field Guide)	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Euchlaena obtusaria (of Field Guide)	Angola Creek Flatwoods, Site 2	91-09-10	L	3
Euchlaena obtusaria (of Field Guide)	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Euchlaena obtusaria (of Field Guide)	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Euchlaena obtusaria (of Field Guide)	Lanier Quarry Savanna, -	92-09-01	L	+
Euchlaena obtusaria (of Field Guide)	Myrtle Head Savanna, Site 2	91-07-10	L	2
Euchlaena obtusaria (of Field Guide)	Myrtle Head Savanna, Site 1	92-05-04	L	2
Euchlaena obtusaria (of Field Guide)	Myrtle Head Savanna, Site 2	92-05-04	L	1
Euchlaena obtusaria (of Field Guide)	Myrtle Head Savanna, Site 2	92-09-02	L	1
Euchlaena amoenaria astylusaria	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Euchlaena amoenaria astylusaria	Angola Creek Flatwoods, Site 1	91-05-09	L	45
Euchlaena amoenaria astylusaria	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Euchlaena amoenaria astylusaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Euchlaena amoenaria astylusaria	Angola Creek Flatwoods, Site 1	91-09-10	L	6
Euchlaena amoenaria astylusaria	Angola Creek Flatwoods, Site 2	91-09-10	L	15
Euchlaena amoenaria astylusaria	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Euchlaena amoenaria astylusaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	2
Euchlaena amoenaria astylusaria	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	7
Euchlaena amoenaria astylusaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Euchlaena amoenaria astylusaria	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	5
Euchlaena amoenaria astylusaria	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Euchlaena pectinaria	Angola Creek Flatwoods, Site 1	91-04-13	L	5
Euchlaena pectinaria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Euchlaena pectinaria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Cymatophora approximaria	Angola Creek Flatwoods, Site 1	91-10-10	L	2
Cymatophora approximaria	Angola Creek Flatwoods, Site 2	91-10-10	L	2
Stenaspilatodes antidiscaria	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Stenaspilatodes antidiscaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	4
Pero zalissaria	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Pero zalissaria	Myrtle Head Savanna, Site 1	91-04-12	L	1
Pero zalissaria	Myrtle Head Savanna, Site 1	91-10-09	L	2
Pero zalissaria	Myrtle Head Savanna, Site 1	92-05-04	L	1
Pero zalissaria	Myrtle Head Savanna, Site 2	92-06-24	L	1
Petrophora divisata	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Petrophora divisata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Tacparia zalissaria	Myrtle Head Savanna, Site 1	91-05-08	L	1
Metarranthus angularia?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Metarranthus homuraria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Metarranthus homuraria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Metarranthus homuraria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Metarranthus lateritiaria	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Metarranthus lateritiaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	5
Metarranthis obfimaria	Angola Creek Flatwoods, Site 1	91-04-13	L	6
Metarranthis obfimaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	2
Metarranthis obfimaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	7
Probole alienaria	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Besma quercivoraria	Angola Creek Flatwoods, Site 1	91-06-11	L	1

Besma quercivoraria	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Lambdina pellucidaria	Angola Creek Flatwoods, Site 1	91-04-13	L	23
Lambdina pellucidaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	4
Lambdina pellucidaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	15
Lambdina pellucidaria	Myrtle Head Savanna, Site 1	91-04-12	L	2
Eusarca fundaria?	Lanier Quarry Savanna, Big Savanna	91-09-10	L	2
Eusarca fundaria	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Eusarca confusaria	Angola Creek Flatwoods, Site 2	91-06-11	L	4
Eusarca confusaria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Eusarca confusaria	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	2
Eusarca confusaria	Green Swamp Preserve, Little Island Savanna	92-09-02	L	1
Eusarca confusaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Eusarca confusaria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	11
Eusarca confusaria	Lanier Quarry Savanna, Big Savanna	91-09-10	L	2
Eusarca confusaria	Lanier Quarry Savanna, Big Savanna	91-10-10	L	4
Eusarca confusaria	Myrtle Head Savanna, Site 1	91-05-08	L	2
Eusarca confusaria	Myrtle Head Savanna, Site 1	91-06-10	L	3
Eusarca confusaria	Myrtle Head Savanna, Site 2	91-09-09	L	3
Eusarca confusaria	Myrtle Head Savanna, Site 1	91-10-09	L	2
Eusarca confusaria	Myrtle Head Savanna, Site 2	91-10-09	L	3
Eusarca confusaria	Myrtle Head Savanna, Site 2	92-06-24	L	2
Eutralepa clemataria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Eutralepa clemataria	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Eutralepa clemataria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Eutralepa clemataria	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Eutralepa clemataria	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Eutralepa clemataria	Myrtle Head Savanna, Site 2	92-06-24	L	1
Patalene olyzonaria puber	Myrtle Head Savanna, Site 1	91-05-08	L	1
Prochoerodes transversata	Angola Creek Flatwoods, Site 1	91-07-11	L	6
Prochoerodes transversata	Angola Creek Flatwoods, Site 2	91-07-11	L	4
Prochoerodes transversata	Angola Creek Flatwoods, -	91-08-06	B	1
Prochoerodes transversata	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	30
Prochoerodes transversata	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	4
Prochoerodes transversata	Lanier Quarry Savanna, Big Savanna	91-07-11	L	6
Prochoerodes transversata	Myrtle Head Savanna, Site 1	91-07-10	L	2
Prochoerodes transversata	Myrtle Head Savanna, Site 2	91-07-10	L	4
Nematocampa resistaria	Lanier Quarry Savanna, -	92-09-01	L	+
Nematocampa baggetaria	Myrtle Head Savanna, Site 1	92-06-24	L	1
Nemoria elfa	Green Swamp Preserve, Big Island Savanna	91-09-09	D	1
Nemoria elfa	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Nemoria elfa	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Nemoria elfa	Myrtle Head Savanna, Site 2	92-06-24	L	2
Nemoria lixaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Nemoria lixaria	Green Swamp Preserve, Big Island Savanna	91-08-05	L	+
Nemoria lixaria	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Nemoria lixaria	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Nemoria lixaria	Myrtle Head Savanna, Site 1	91-07-10	L	1
Nemoria lixaria	Myrtle Head Savanna, Site 2	92-05-04	L	1
Nemoria saturiba	Green Swamp Preserve, Big Island Savanna	91-09-09	D	1
Nemoria saturiba	Myrtle Head Savanna, Site 2	92-09-02	L	2
Nemoria bifilata	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Nemoria mimosaria	Myrtle Head Savanna, Site 1	91-05-08	L	1
Nemoria sp.	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Nemoria sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	O	1
Nemoria sp.	Myrtle Head Savanna, Site 2	91-07-10	L	1
Nemoria sp. 1	Angola Creek Flatwoods, Site 1	91-06-11	L	2
Nemoria sp. 1	Angola Creek Flatwoods, Site 2	91-06-11	L	2
Nemoria sp. 2	Angola Creek Flatwoods, Site 2	91-06-11	L	2
Dichorda iridaria	Myrtle Head Savanna, -	91-09-09	D	1
Synchlora aerata	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Synchlora aerata	Myrtle Head Savanna, Site 1	91-06-10	L	1
Synchlora frondaria?	Angola Creek Flatwoods, Site 2	91-09-10	L	1

Synchlora frondaria?	Myrtle Head Savanna, Site 1	92-06-24	L	1
Chlorochlamys chloroleucaria	Angola Creek Flatwoods, Site 2	91-06-11	L	3
Chlorochlamys chloroleucaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Chlorochlamys chloroleucaria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Chlorochlamys chloroleucaria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Chlorochlamys chloroleucaria	Myrtle Head Savanna, Site 1	91-04-12	L	1
Chlorochlamys chloroleucaria	Myrtle Head Savanna, Site 1	91-05-08	L	2
Chlorochlamys sp.	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Chlorochlamys ?	Myrtle Head Savanna, Site 1	91-05-08	L	2
Chloropteryx tepperaria	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Chloropteryx tepperaria	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Chloropteryx tepperaria	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Chloropteryx tepperaria	Lanier Quarry Savanna, -	92-09-01	L	+
Hethemia pistasciaria	Angola Creek Flatwoods, Site 1	91-04-13	L	13
Hethemia pistasciaria	Angola Creek Flatwoods, Site 1	91-05-09	L	3
Hethemia pistasciaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	4
Hethemia pistasciaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	4
Hethemia pistasciaria	Myrtle Head Savanna, Site 1	91-05-08	L	2
Idaea demissaria	Angola Creek Flatwoods, Site 1	91-06-11	L	4
Idaea demissaria	Angola Creek Flatwoods, Site 2	91-06-11	L	2
Idaea demissaria	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Idaea demissaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Idaea demissaria	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Idaea demissaria	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Idaea demissaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Idaea demissaria	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Idaea demissaria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Idaea demissaria	Lanier Quarry Savanna, Big Savanna	91-07-11	L	4
Idaea demissaria	Lanier Quarry Savanna, Big Savanna	91-08-06	L	3
Idaea demissaria	Lanier Quarry Savanna, -	92-09-01	L	+
Idaea demissaria	Myrtle Head Savanna, Site 1	91-07-10	L	1
Idaea demissaria	Myrtle Head Savanna, Site 2	91-07-10	L	2
Idaea demissaria	Myrtle Head Savanna, Site 1	91-09-09	L	1
Idaea violacearia	Angola Creek Flatwoods, Site 2	91-06-11	L	2
Idaea violacearia	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Idaea violacearia	Green Swamp Preserve, Big Island Savanna	92-06-24	S	1
Idaea violacearia	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Idaea violacearia	Green Swamp Preserve, Big Island Savanna	92-09-02	B	1
Idaea tacturata	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Idaea tacturata	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Idaea tacturata	Angola Creek Flatwoods, Site 2	91-09-10	L	3
Idaea tacturata	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Idaea tacturata	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Idaea tacturata	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Idaea tacturata	Lanier Quarry Savanna, -	92-09-01	L	+
Idaea tacturata	Myrtle Head Savanna, Site 2	92-06-24	L	3
Pleuroprucha insulsaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Pleuroprucha insulsaria	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Pleuroprucha insulsaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Pleuroprucha insulsaria	Green Swamp Preserve, Big Island Savanna	92-09-02	L	1
Pleuroprucha insulsaria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	2
Pleuroprucha insulsaria	Lanier Quarry Savanna, -	92-09-01	L	+
Pleuroprucha insulsaria	Myrtle Head Savanna, Site 1	91-07-10	L	3
Cyclophora packardi	Lanier Quarry Savanna, -	92-09-01	L	+
Cyclophora myrtaria	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Cyclophora myrtaria	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Cyclophora myrtaria	Green Swamp Preserve, Little Island Savanna	92-09-02	L	1
Cyclophora myrtaria	Lanier Quarry Savanna, -	92-09-01	L	+
Cyclophora myrtaria	Myrtle Head Savanna, Site 1	92-09-02	L	1
Scopula purata	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Scopula limboundata	Angola Creek Flatwoods, Site 1	91-09-10	L	3
Scopula limboundata	Angola Creek Flatwoods, Site 2	91-09-10	L	1

Scopula limboundata?	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Scopula limboundata	Lanier Quarry Savanna, -	92-09-01	L	+
Scopula inductata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Scopula ?	Myrtle Head Savanna, Site 1	91-05-08	L	1
Lophosis labeculata	Lanier Quarry Savanna, -	92-09-01	L	+
Lophosis labeculata	Myrtle Head Savanna, Site 1	91-05-08	L	4
Lophosis labeculata	Myrtle Head Savanna, Site 2	91-07-10	L	2
Eulithis diversilineata	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Eulithis diversilineata	Lanier Quarry Savanna, Big Savanna	91-06-11	L	2
Eulithis gracilineata	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Hydria prunivorata?	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Hydria prunivorata?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	4
Anticlea multiferata	Angola Creek Flatwoods, -	91-10-10	B	1
Orthonama obstipata	Myrtle Head Savanna, Site 1	92-05-04	L	1
Orthonama centrostrigaria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Orthonama centrostrigaria	Green Swamp Preserve, Big Island Savanna	92-09-02	L	1
Orthonama centrostrigaria	Myrtle Head Savanna, Site 1	92-06-24	L	1
Disclisioprocta stellata	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Disclisioprocta stellata	Myrtle Head Savanna, Site 1	91-09-09	L	1
Eubaphe meridiana	Green Swamp Preserve, Little Island Savanna	92-05-04	L	2
Eubaphe meridiana	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Eubaphe meridiana	Myrtle Head Savanna, Site 1	91-07-10	L	1
Eubaphe meridiana	Myrtle Head Savanna, Site 2	91-07-10	L	1
Eubaphe meridiana	Myrtle Head Savanna, Site 1	92-05-04	L	1
Eupithecia miserulata	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Eupithecia miserulata	Angola Creek Flatwoods, Site 1	91-10-10	L	1
Eupithecia miserulata	Lanier Quarry Savanna, -	92-09-01	L	+
Eupithecia miserulata	Myrtle Head Savanna, Site 1	91-05-08	L	1
Eupithecia miserulata	Myrtle Head Savanna, Site 1	91-06-10	L	1
Eupithecia miserulata	Myrtle Head Savanna, Site 1	91-09-09	L	1
Lacosoma chiridota	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Lacosoma chiridota	Angola Creek Flatwoods, Site 2	91-08-06	L	1
Lacosoma chiridota	Green Swamp Preserve, Big Island Savanna	91-08-05	L	+
Lacosoma chiridota	Lanier Quarry Savanna, -	92-09-01	L	+
Lacosoma chiridota	Myrtle Head Savanna, Site 2	91-07-10	L	1
Apatelodes torrefacta	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Apatelodes torrefacta	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Apatelodes torrefacta	Myrtle Head Savanna, Site 1	91-06-10	L	2
Apatelodes torrefacta	Myrtle Head Savanna, Site 1	91-07-10	L	1
Tolype notialis	Angola Creek Flatwoods, Site 2	91-06-11	L	2
Tolype notialis	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Tolype notialis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Tolype notialis	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	2
Tolype notialis	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Tolype notialis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Tolype notialis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Tolype notialis	Lanier Quarry Savanna, -	92-09-01	L	+
Tolype notialis	Myrtle Head Savanna, Site 1	91-07-10	L	1
Tolype notialis	Myrtle Head Savanna, Site 2	91-07-10	L	2
Tolype notialis	Myrtle Head Savanna, Site 1	92-09-02	L	2
Tolype notialis/minta	Angola Creek Flatwoods, Site 1	91-06-11	L	3
Tolype notialis/minta	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Tolype notialis/minta	Myrtle Head Savanna, Site 1	91-05-08	L	2
Tolype minta	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	4
Tolype minta	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Tolype minta	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Tolype minta	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Tolype minta	Myrtle Head Savanna, Site 1	91-06-10	L	2
Tolype minta	Myrtle Head Savanna, Site 1	91-10-09	L	9
Tolype minta	Myrtle Head Savanna, Site 2	91-10-09	L	6
Tolype sp.	Mixed, -	91-08-05	L	1
Artace cribraria	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1

Malacosoma americanum	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Malacosoma americanum	Myrtle Head Savanna, Site 1	91-05-08	L	1
Eacles imperialis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Eacles imperialis	Angola Creek Flatwoods, Site 1	91-08-06	L	1
Eacles imperialis	Angola Creek Flatwoods, Site 1	91-08-06	x	3
Eacles imperialis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Eacles imperialis	Lanier Quarry Savanna, Big Savanna	91-08-06	L	4
Eacles imperialis	Lanier Quarry Savanna, Big Savanna	91-08-06	O	1
Eacles imperialis	Lanier Quarry Savanna, -	92-09-01	L	5
Eacles imperialis	Myrtle Head Savanna, Site 1	91-07-10	O	1
Eacles imperialis	Myrtle Head Savanna, Site 1	91-08-05	L	1
Eacles imperialis	Myrtle Head Savanna, Site 2	91-08-05	L	6
Eacles imperialis	Myrtle Head Savanna, Site 2	91-08-05	O	2
Eacles imperialis	Myrtle Head Savanna, Site 2	92-09-02	L	2
Citheronia regalis	Myrtle Head Savanna, Site 1	91-07-10	L	2
Citheronia sepulchralis	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Citheronia sepulchralis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Citheronia sepulchralis	Myrtle Head Savanna, Site 2	91-07-10	L	1
Dryocampa rubicunda	Angola Creek Flatwoods, Site 1	91-04-13	L	5
Dryocampa rubicunda	Angola Creek Flatwoods, -	91-05-09	L	1
Dryocampa rubicunda	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Dryocampa rubicunda	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Dryocampa rubicunda	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Dryocampa rubicunda	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Dryocampa rubicunda	Angola Creek Flatwoods, Site 1	91-08-06	x	1
Dryocampa rubicunda	Angola Creek Flatwoods, Site 1	91-09-10	L	3
Dryocampa rubicunda	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Dryocampa rubicunda	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	+
Dryocampa rubicunda	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Dryocampa rubicunda	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Dryocampa rubicunda	Green Swamp Preserve, Little Island Savanna	92-05-04	O	1
Dryocampa rubicunda	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Dryocampa rubicunda	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Dryocampa rubicunda	Lanier Quarry Savanna, Big Savanna	91-08-06	L	4
Dryocampa rubicunda	Lanier Quarry Savanna, -	92-09-01	L	2
Dryocampa rubicunda	Myrtle Head Savanna, Site 1	91-05-08	L	3
Dryocampa rubicunda	Myrtle Head Savanna, Site 1	91-07-10	L	2
Dryocampa rubicunda	Myrtle Head Savanna, Site 2	91-07-10	L	2
Dryocampa rubicunda	Myrtle Head Savanna, Site 1	91-08-05	L	2
Dryocampa rubicunda	Myrtle Head Savanna, Site 2	91-08-05	L	3
Dryocampa rubicunda	Myrtle Head Savanna, Site 1	92-05-04	L	1
Dryocampa rubicunda	Myrtle Head Savanna, Site 1	92-09-02	L	1
Dryocampa rubicunda	Myrtle Head Savanna, Site 2	92-09-02	O	1
Anisota stigma	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Anisota stigma	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Anisota stigma	Angola Creek Flatwoods, Site 2	91-07-11	L	3
Anisota stigma	Angola Creek Flatwoods, Site 2	91-07-11	L	4
Anisota stigma	Angola Creek Flatwoods, Site 1	91-08-06	L	1
Anisota stigma	Lanier Quarry Savanna, Big Savanna	91-07-11	L	3
Anisota stigma	Lanier Quarry Savanna, Big Savanna	91-07-11	L	5
Anisota stigma	Mixed, -	91-08-05	L	1
Anisota stigma	Myrtle Head Savanna, Site 1	91-07-10	L	1
Anisota stigma	Myrtle Head Savanna, Site 1	91-08-05	L	1
Anisota stigma	Myrtle Head Savanna, Site 1	91-08-05	O	+
Anisota stigma	Myrtle Head Savanna, Site 2	91-08-05	L	1
Anisota senatoria	Lanier Quarry Savanna, -	92-09-01	L	1
Automeris io	Angola Creek Flatwoods, Site 1	91-07-11	L	4
Automeris io	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Automeris io	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Automeris io	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Automeris io	Lanier Quarry Savanna, Big Savanna	91-07-11	L	3
Automeris io	Myrtle Head Savanna, Site 1	91-07-10	L	2

Automeris io	Myrtle Head Savanna, Site 2	91-07-10	L	2
Antheraea polyphemus	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Antheraea polyphemus	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Antheraea polyphemus	Angola Creek Flatwoods, Site 1	91-08-06	L	1
Antheraea polyphemus	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Antheraea polyphemus	Lanier Quarry Savanna, -	92-09-01	L	1
Antheraea polyphemus	Myrtle Head Savanna, Site 2	91-08-05	L	1
Antheraea polyphemus	Myrtle Head Savanna, Site 1	91-09-09	O	1
Antheraea polyphemus	Myrtle Head Savanna, Site 1	92-09-02	L	1
Actias luna	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Actias luna	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Actias luna	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Actias luna	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Actias luna	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Actias luna	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Actias luna	Lanier Quarry Savanna, -	92-09-01	L	3
Actias luna	Myrtle Head Savanna, Site 1	91-08-05	O	2
Actias luna	Myrtle Head Savanna, Site 1	91-09-09	O	2
Actias luna	Myrtle Head Savanna, Site 2	91-09-09	O	+
Actias luna	Myrtle Head Savanna, Site 2	92-09-02	O	+
Actias luna	Mytle Head Savanna, Site 1	91-05-08	L	1
Callosamia angulifera	Myrtle Head Savanna, Site 2	92-05-04	L	1
Hyalophora cecropia	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	5
Hyalophora cecropia	Lanier Quarry Savanna, Big Savanna	91-04-13	L	4
Agrius cingulata	Myrtle Head Savanna, Site 1	91-09-09	L	2
Manduca sexta	Angola Creek Flatwoods, Site 1	91-08-06	L	1
Manduca sexta	Lanier Quarry Savanna, -	92-09-01	L	1
Manduca sexta	Myrtle Head Savanna, Site 1	91-08-05	L	2
Manduca sexta	Myrtle Head Savanna, Site 2	91-09-09	L	1
Manduca quinquemaculata	Myrtle Head Savanna, Site 2	91-08-05	L	1
Manduca rustica	Myrtle Head Savanna, Site 1	91-08-05	L	1
Dolba hyloeus	Myrtle Head Savanna, Site 1	92-06-24	L	1
Ceratomia catalpae	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Ceratomia catalpae	Myrtle Head Savanna, Site 1	91-08-05	L	1
Sphinx gordius	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Sphinx gordius	Angola Creek Flatwoods, -	91-05-09	L	1
Sphinx gordius	Angola Creek Flatwoods, Site 1	91-08-06	L	3
Sphinx gordius	Green Swamp Preserve, Beanpatch Savanna	92-05-04	L	3
Sphinx gordius	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Sphinx gordius	Myrtle Head Savanna, Site 2	92-05-04	L	2
Lapara coniferarum	Angola Creek Flatwoods, Site 1	91-06-11	L	4
Lapara coniferarum	Angola Creek Flatwoods, Site 2	91-07-11	L	3
Lapara coniferarum	Angola Creek Flatwoods, Site 1	91-08-06	x	1
Lapara coniferarum	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Lapara coniferarum	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Lapara coniferarum	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Lapara coniferarum	Green Swamp Preserve, Big Island Savanna	91-08-05	L	3
Lapara coniferarum	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	3
Lapara coniferarum	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Lapara coniferarum	Green Swamp Preserve, Little Island Savanna	92-05-04	O	1
Lapara coniferarum	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Lapara coniferarum	Green Swamp Preserve, Little Island Savanna	92-09-02	O	1
Lapara coniferarum	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Lapara coniferarum	Lanier Quarry Savanna, -	92-09-01	L	5
Lapara coniferarum	Myrtle Head Savanna, Site 1	91-05-08	L	1
Lapara coniferarum	Myrtle Head Savanna, Site 1	91-08-05	L	1
Lapara coniferarum	Myrtle Head Savanna, Site 2	91-08-05	L	2
Lapara coniferarum	Myrtle Head Savanna, Site 2	91-09-09	L	2
Paonias excaecatus	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Paonias excaecatus	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Paonias excaecatus	Lanier Quarry Savanna, -	92-09-01	L	1
Paonias myops	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1

Paonias myops	Lanier Quarry Savanna, -	92-09-01	L	3
Paonias myops	Myrtle Head Savanna, Site 1	91-08-05	L	1
Paonias myops	Myrtle Head Savanna, Site 2	91-08-05	L	1
Paonias myops	Myrtle Head Savanna, Site 2	91-09-09	O	+
Paonias astylus	Myrtle Head Savanna, Site 1	91-05-08	L	1
Paonias astylus	Myrtle Head Savanna, Site 2	91-09-09	L	1
Paonias astylus	Myrtle Head Savanna, Site 1	92-06-24	L	1
Daraspa myron	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Darapsa myron	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Darapsa myron	Lanier Quarry Savanna, Big Savanna	91-09-10	O	1
Daraspa myron	Myrtle Head Savanna, Site 1	91-05-08	L	1
Daraspa myron	Myrtle Head Savanna, Site 2	91-07-10	L	1
Daraspa pholus	Angola Creek Flatwoods, -	91-05-09	L	1
Darapsa pholus	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Darapsa pholus	Lanier Quarry Savanna, -	92-09-01	L	1
Daraspa pholus	Myrtle Head Savanna, Site 1	91-07-10	L	1
Darapsa pholus	Myrtle Head Savanna, Site 2	91-08-05	L	1
Xylophanes tersa	Myrtle Head Savanna, Site 1	91-08-05	L	1
Clostera inclusa	Lanier Quarry Savanna, -	92-09-01	L	+
Datana ministra	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Datana ministra	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Datana ministra	Myrtle Head Savanna, Site 1	91-06-10	L	1
Datana ministra	Myrtle Head Savanna, Site 2	91-07-10	L	1
Datana angusii?	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Datana drexelii	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Datana drexelii	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Datana drexelii/major	Angola Creek Flatwoods, Site 1	91-07-11	L	4
Datana drexelii/major	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Datana drexelii/major	Angola Creek Flatwoods, Site 2	91-07-11	L	7
Datana drexelii/major	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Datana drexelii/major	Lanier Quarry Savanna, Big Savanna	91-07-11	L	12
Datana drexelii/major	Lanier Quarry Savanna, Big Savanna	91-08-06	L	6
Datana drexelii/major	Myrtle Head Savanna, Site 1	91-07-10	L	1
Datana drexelii/major	Myrtle Head Savanna, Site 1	91-07-10	L	1
Datana drexelii/major	Myrtle Head Savanna, Site 2	91-07-10	L	4
Datana major	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Datana major?	Myrtle Head Savanna, Site 1	92-09-02	L	1
Datana contracta	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Datana contracta	Angola Creek Flatwoods, Site 2	91-07-11	L	3
Datana perspicua	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Datana ranaeceps	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Datana ranaeceps	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Datana ranaeceps	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Datana ranaeceps	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Datana ranaeceps	Myrtle Head Savanna, Site 1	91-07-10	L	1
Datana ranaeceps	Myrtle Head Savanna, Site 2	91-07-10	L	1
Datana sp.	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Nadata gibbosa	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Nadata gibbosa	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Nadata gibbosa	Lanier Quarry Savanna, -	92-09-01	L	2
Nadata gibbosa	Mixed, -	91-08-05	L	1
Nadata gibbosa	Myrtle Head Savanna, Site 1	91-06-10	L	1
Nadata gibbosa	Myrtle Head Savanna, Site 2	91-09-09	L	1
Hyperaeschra georgica	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Hyperaeschra georgica	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Peridea angulosa	Lanier Quarry Savanna, -	92-09-01	L	2
Peridea angulosa	Myrtle Head Savanna, Site 2	91-07-10	L	1
Peridea angulosa	Myrtle Head Savanna, Site 2	91-10-09	L	1
Peridea angulosa	Myrtle Head Savanna, Site 1	92-09-02	L	1
Furcula cinerea	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Furcula cinerea	Myrtle Head Savanna, Site 1	92-09-02	L	1
Symmerista albifrons	Lanier Quarry Savanna, -	92-09-01	L	6

Dasylophia anguina	Mixed, -	91-08-05	L	1
Heterocampa obliqua	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Heterocampa obliqua	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Heterocampa obliqua	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Heterocampa obliqua	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Heterocampa obliqua	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Heterocampa obliqua	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Heterocampa obliqua	Myrtle Head Savanna, Site 1	91-05-08	L	1
Heterocampa obliqua	Myrtle Head Savanna, Site 1	91-07-10	L	1
Heterocampa obliqua	Myrtle Head Savanna, Site 2	91-07-10	L	3
Heterocampa obliqua?	Myrtle Head Savanna, Site 2	91-09-09	L	2
Heterocampa umbrata	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Heterocampa umbrata	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Heterocampa guttivitata	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Heterocampa guttivitata?	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Heterocampa guttivitata	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Heterocampa guttivitata	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	5
Heterocampa guttivitata	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Heterocampa guttivitata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	6
Heterocampa guttivitata	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Heterocampa guttivitata	Lanier Quarry Savanna, -	92-09-01	L	1
Heterocampa guttivitata	Myrtle Head Savanna, Site 1	91-05-08	L	9
Heterocampa guttivitata	Myrtle Head Savanna, Site 1	91-07-10	L	1
Heterocampa guttivitata	Myrtle Head Savanna, Site 2	91-07-10	L	2
Heterocampa guttivitata?	Myrtle Head Savanna, Site 1	91-09-09	L	1
Heterocampa guttivitata?	Myrtle Head Savanna, Site 2	91-09-09	L	1
Heterocampa guttivitata	Myrtle Head Savanna, Site 1	92-05-04	L	1
Heterocampa guttivitata	Myrtle Head Savanna, Site 2	92-05-04	L	3
Heterocampa guttivitata	Myrtle Head Savanna, Site 2	92-06-24	L	1
Heterocampa biundata	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Heterocampa biundata	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	2
Heterocampa biundata	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Heterocampa biundata	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Heterocampa biundata	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Heterocampa biundata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Heterocampa biundata	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Heterocampa biundata	Myrtle Head Savanna, Site 2	91-07-10	L	2
Heterocampa biundata	Myrtle Head Savanna, Site 1	92-09-02	L	1
Lochmaeus manteo	Lanier Quarry Savanna, -	92-09-01	L	3
Lochmacus manteo	Myrtle Head Savanna, Site 2	91-07-10	L	1
Lochmaeus manteo	Myrtle Head Savanna, Site 1	92-09-02	L	1
Schizura ipomoeae	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Schizura ipomoeae	Myrtle Head Savanna, Site 1	91-06-10	L	1
Schizura ipomoeae	Myrtle Head Savanna, Site 2	91-07-10	L	1
Schizura ipomoeae	Myrtle Head Savanna, Site 1	91-09-09	L	1
Schizura ipomoeae	Myrtle Head Savanna, Site 2	91-09-09	L	3
Schizura ipomoeae	Myrtle Head Savanna, Site 1	92-06-24	L	3
Schizura ipomoeae	Myrtle Head Savanna, Site 2	92-06-24	L	2
Schizura ipomoeae	Myrtle Head Savanna, Site 1	92-09-02	L	1
Schizura unicornis	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Schizura unicornis	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Schizura unicornis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Schizura unicornis	Lanier Quarry Savanna, -	92-09-01	L	2
Schizura unicornis	Myrtle Head Savanna, Site 2	91-07-10	L	2
Schizura unicornis	Myrtle Head Savanna, Site 1	92-09-02	L	1
Schizura concinna	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Hyparpax aurora	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Hyparpax aurora	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Crambidia lithosioides	Lanier Quarry Savanna, -	92-09-01	L	+
Crambidia pallida	Angola Creek Flatwoods, Site 1	91-09-10	L	23
Crambidia pallida?	Angola Creek Flatwoods, Site 2	91-09-10	L	37
Crambidia pallida?	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	35

Crambidia pallida	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	7
Crambidia pallida?	Lanier Quarry Savanna, Big Savanna	91-09-10	L	62
Crambidia pallida	Myrtle Head Savanna, Site 1	91-07-10	L	1
Crambidia pallida?	Myrtle Head Savanna, Site 1	91-09-09	L	14
Crambidia pallida?	Myrtle Head Savanna, Site 2	91-09-09	L	27
Crambidia pallida?	Myrtle Head Savanna, Site 1	91-10-09	L	25
Crambidia pallida?	Myrtle Head Savanna, Site 2	91-10-09	L	2
Crambidia nr. pallida	Green Swamp Preserve, Big Island Savanna	92-06-24	L	40
Crambidia nr. pallida	Green Swamp Preserve, Little Island Savanna	92-06-24	L	50
Crambidia uniformis	Green Swamp Preserve, Big Island Savanna	92-06-24	L	3
Crambidia uniformis	Green Swamp Preserve, Little Island Savanna	92-06-24	L	9
Crambidia pura/cephalica complex	Angola Creek Flatwoods, Site 2	91-09-10	L	9
Crambidia pura/cephalica complex	Angola Creek Flatwoods, Site 1	91-10-10	L	1
Crambidia pura/cephalica complex	Angola Creek Flatwoods, Site 2	91-10-10	L	7
Crambidia sp.	Angola Creek Flatwoods, Site 1	91-05-09	L	7
Crambidia sp.	Angola Creek Flatwoods, Site 1	91-06-11	L	25
Crambidia sp.	Angola Creek Flatwoods, Site 2	91-06-11	L	15
Crambidia sp.	Angola Creek Flatwoods, Site 1	91-07-11	L	23
Crambidia sp.	Angola Creek Flatwoods, Site 2	91-07-11	L	12
Crambidia sp.	Angola Creek Flatwoods, Site 1	91-08-06	L	+
Crambidia sp.	Angola Creek Flatwoods, Site 2	91-08-06	L	+
Crambidia sp.	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Crambidia spp.	Angola Creek Flatwoods, -	91-10-10	B	2
Crambidia "brown sp."	Angola Creek Flatwoods, Site 1	91-10-10	L	8
Crambidia spp.	Angola Creek Flatwoods, Site 2	91-10-10	L	8
Crambidia sp.	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	5
Crambidia sp.	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	3
Crambidia sp.	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Crambidia spp.	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	7
Crambidia sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Crambidia sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	O	2
Crambidia sp.	Lanier Quarry Savanna, Big Savanna	91-05-09	L	62
Crambidia sp.	Lanier Quarry Savanna, Big Savanna	91-06-11	L	38
Crambidia sp.	Lanier Quarry Savanna, Big Savanna	91-07-11	L	45
Crambidia sp.	Lanier Quarry Savanna, Big Savanna	91-08-06	L	12
Crambidia spp.	Lanier Quarry Savanna, Big Savanna	91-10-10	L	5
Crambidia sp.	Myrtle Head Savanna, Site 1	91-05-08	L	29
Crambidia sp.	Myrtle Head Savanna, Site 1	91-06-10	L	43
Crambidia sp.	Myrtle Head Savanna, Site 1	91-07-10	L	2
Crambidia sp.	Myrtle Head Savanna, Site 2	91-07-10	L	10
Crambidia sp.	Myrtle Head Savanna, Site 1	91-09-09	L	2
Crambidia sp.	Myrtle Head Savanna, Site 2	91-09-09	L	1
Crambidia "brown sp."	Myrtle Head Savanna, Site 1	91-10-09	L	2
Crambidia spp.	Myrtle Head Savanna, Site 1	92-06-24	L	11
Crambidia spp.	Myrtle Head Savanna, Site 2	92-06-24	L	35
Cisthene kentuckiensis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Cisthene plumbea	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Cisthene plumbea	Angola Creek Flatwoods, Site 2	91-09-10	L	4
Cisthene plumbea	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Cisthene plumbea	Lanier Quarry Savanna, -	92-09-01	L	2
Cisthene plumbea	Myrtle Head Savanna, Site 1	91-05-08	L	1
Cisthene subjecta	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Cisthene subjecta	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Cisthene subjecta	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Cisthene subjecta	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Cisthene subjecta	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Cisthene packardii	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Cisthene packardii	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Cisthene packardii	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Cisthene packardii	Lanier Quarry Savanna, -	92-09-01	L	1
Cisthene parckardii	Myrtle Head Savanna, Site 1	91-05-08	L	3
Cisthene packardii	Myrtle Head Savanna, Site 2	91-07-10	L	6

Cisthene packardii	Myrtle Head Savanna, Site 2	91-09-09	L	1
Hypoprepia miniata	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Hypoprepia miniata	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Hypoprepia miniata	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Hypoprepia miniata	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Hypoprepia miniata	Myrtle Head Savanna, Site 1	92-06-24	L	7
Hypoprepia miniata	Myrtle Head Savanna, Site 2	92-06-24	L	1
Hypoprepia fucosa	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Hypoprepia fucosa	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	3
Hypoprepia fucosa	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Hypoprepia fucosa	Lanier Quarry Savanna, Big Savanna	91-06-11	L	2
Hypoprepia fucosa	Lanier Quarry Savanna, -	92-09-01	L	4
Hypoprepia fucosa	Myrtle Head Savanna, Site 1	91-05-08	L	1
Hypoprepia fucosa	Myrtle Head Savanna, Site 1	91-09-09	L	2
Hypoprepia sp.	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Clemensia albata	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Clemensia albata	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Clemensia albata	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Clemensia albata	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Clemensia albata	Angola Creek Flatwoods, -	91-10-10	B	1
Clemensia albata	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Clemensia albata	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Clemensia albata	Green Swamp Preserve, Big Island Savanna	92-06-24	S	1
Clemensia albata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Clemensia albata	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Clemensia albata	Myrtle Head Savanna, Site 2	92-06-24	L	1
Pagara simplex	Angola Creek Flatwoods, Site 1	91-06-11	L	2
Pagara simplex	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Pagara simplex	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Pagara simplex	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Pagara simplex	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Pagara simplex	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Pagara simplex	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Pagara simplex	Green Swamp Preserve, Big Island Savanna	92-06-24	L	8
Pagara simplex	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Pagara simplex	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Pagara simplex	Lanier Quarry Savanna, Big Savanna	91-04-13	L	6
Pagara simplex	Lanier Quarry Savanna, Big Savanna	91-06-11	L	17
Pagara simplex	Lanier Quarry Savanna, Big Savanna	91-07-11	L	3
Pagara simplex	Lanier Quarry Savanna, Big Savanna	91-08-06	L	9
Pagara simplex	Lanier Quarry Savanna, Big Savanna	91-09-10	L	2
Pagara simplex	Lanier Quarry Savanna, Big Savanna	91-10-10	L	5
Pagara simplex	Myrtle Head Savanna, Site 1	92-06-24	L	1
Comachara cadburyi	Angola Creek Flatwoods, Site 1	91-04-13	L	7
Comachara cadburyi	Angola Creek Flatwoods, Site 1	91-05-09	L	3
Comachara cadburyi	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Utetheisa bella	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Utetheisa bella	Green Swamp Preserve, Big Island Savanna	91-10-09	O	+
Utetheisa bella	Lanier Quarry Savanna, Front Savanna	91-09-11	O	1
Utetheisa bella	Mixed, -	91-08-05	L	1
Haploa clymene	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Haploa clymene	Mixed, -	91-08-05	L	1
Haploa colona	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Holomelina laeta	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Holomelina laeta	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Holomelina laeta	Angola Creek Flatwoods, Site 2	91-07-11	L	4
Holomelina laeta	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Holomelina laeta	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Holomelina laeta	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	5
Holomelina laeta	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	7
Holomelina laeta	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Holomelina laeta	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1

Holomelina laeta	Lanier Quarry Savanna, Big Savanna	91-08-06	L	12
Holomelina laeta	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Holomelina laeta	Lanier Quarry Savanna, -	92-09-01	L	4
Holomelina laeta	Myrtle Head Savanna, Site 2	91-07-10	L	7
Holomelina laeta	Myrtle Head Savanna, Site 1	91-09-09	L	1
Holomelina opella	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	2
Holomelina opella	Lanier Quarry Savanna, -	92-09-01	L	1
Holomelina opella/nigricans	Green Swamp Preserve, Little Island Savanna	92-05-04	L	2
Holomelina opella/nigricans	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Holomelina opella/nigricans	Myrtle Head Savanna, Site 1	92-05-04	L	1
Holomelina aurantiaca	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Holomelina aurantiaca	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Holomelina aurantiaca	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Holomelina aurantiaca	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Holomelina aurantiaca	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Holomelina aurantiaca	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Holomelina aurantiaca	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Holomelina aurantiaca	Green Swamp Preserve, Little Island Savanna	92-09-02	L	1
Holomelina aurantiaca	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Holomelina aurantiaca	Lanier Quarry Savanna, -	92-09-01	L	1
Holomelina aurantiaca	Myrtle Head Savanna, Site 1	91-07-10	L	4
Holomelina aurantiaca	Myrtle Head Savanna, Site 2	91-07-10	L	2
Holomelina aurantiaca	Myrtle Head Savanna, Site 1	91-09-09	L	1
Holomelina aurantiaca	Myrtle Head Savanna, Site 1	91-10-09	L	6
Holomelina aurantiaca	Myrtle Head Savanna, Site 2	91-10-09	L	1
Holomelina rubicundaria	Lanier Quarry Savanna, -	92-09-01	L	1
Spilosoma congrua	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Spilosoma congrua	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Spilosoma congrua	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Spilosoma congrua	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Spilosoma congrua	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Spilosoma congrua	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Spilosoma congrua	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Spilosoma congrua	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Spilosoma congrua	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Spilosoma congrua	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Spilosoma congrua	Myrtle Head Savanna, Site 1	91-05-08	L	1
Spilosoma congrua	Myrtle Head Savanna, Site 1	91-06-10	L	1
Spilosoma congrua	Myrtle Head Savanna, Site 1	92-05-04	L	1
Spilosoma congrua	Myrtle Head Savanna, Site 1	92-06-24	L	4
Spilosoma congrua	Myrtle Head Savanna, Site 2	92-06-24	L	1
Spilosoma dubia	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Spilosoma dubia	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	3
Spilosoma dubia	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Spilosoma dubia	Myrtle Head Savanna, Site 1	91-04-12	L	1
Spilosoma virginica	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Spilosoma virginica	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Spilosoma virginica	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Spilosoma virginica	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Spilosoma virginica	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Spilosoma virginica	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Spilosoma virginica	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Spilosoma virginica	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Spilosoma virginica	Lanier Quarry Savanna, Big Savanna	91-08-06	L	11
Spilosoma virginica	Myrtle Head Savanna, Site 1	91-05-08	L	2
Spilosoma virginica	Myrtle Head Savanna, Site 1	91-07-10	L	1
Spilosoma virginica	Myrtle Head Savanna, Site 2	91-07-10	L	1
Spilosoma virginica	Myrtle Head Savanna, Site 1	92-05-04	O	+
Spilosoma virginica	Myrtle Head Savanna, Site 2	92-09-02	O	+
Hyphantria cunea	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Hyphantria cunea	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Hyphantria cunea	Lanier Quarry Savanna, -	92-09-01	L	2

Hyphantria cunea	Myrtle Head Savanna, Site 1	91-06-10	L	3
Hyphantria cunea	Myrtle Head Savanna, Site 1	92-06-24	L	11
Hyphantria cunea	Myrtle Head Savanna, Site 1	92-09-02	L	1
Ecpantheria scribonia	Mixed, -	91-08-05	L	1
Ecpantheria scribonia	Myrtle Head Savanna, Site 2	91-08-05	O	1
Ecpantheria scribonia	Myrtle Head Savanna, Site 1	92-09-02	O	1
Apantesis phalerata	Lanier Quarry Savanna, Big Savanna	91-04-13	L	5
Apantesis phalerata?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	10
Apantesis phalerata	Myrtle Head Savanna, Site 1	91-04-12	L	1
Apantesis phalerata?	Myrtle Head Savanna, Site 1	91-09-09	L	1
Apantesis phalerata	Myrtle Head Savanna, Site 1	92-05-04	L	1
Apantesis vittata?	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Apantesis vittata	Lanier Quarry Savanna, -	92-09-01	L	6
Apantesis nais/vittata	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Apantesis nais/vittata	Angola Creek Flatwoods, Site 1	91-05-09	L	7
Apantesis nais/vittata	Angola Creek Flatwoods, Site 1	91-07-11	L	23
Apantesis nais/vittata	Angola Creek Flatwoods, Site 2	91-07-11	L	7
Apantesis nais/vittata	Angola Creek Flatwoods, Site 1	91-08-06	L	2
Apantesis nais/vittata	Angola Creek Flatwoods, Site 1	91-09-10	L	15
Apantesis nais/vittata	Angola Creek Flatwoods, Site 2	91-09-10	L	11
Apantesis nais/vittata	Angola Creek Flatwoods, Site 1	91-10-10	L	2
Apantesis nais/vittata	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Apantesis nais/vittata	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Apantesis nais/vittata	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	18
Apantesis nais/vittata	Green Swamp Preserve, Big Island Savanna	91-08-05	L	7
Apantesis nais/vittata	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Apantesis nais/vittata	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Apantesis nais/vittata	Green Swamp Preserve, Big Island Savanna	92-06-24	L	2
Apantesis nais/vittata	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Apantesis nais/vittata	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Apantesis nais/vittata	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Apantesis nais/vittata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Apantesis nais/vittata	Lanier Quarry Savanna, Big Savanna	91-07-11	L	20
Apantesis nais/vittata	Lanier Quarry Savanna, Big Savanna	91-08-06	L	8
Apantesis nais/vittata	Lanier Quarry Savanna, Big Savanna	91-09-10	L	6
Apantesis nais/vittata	Lanier Quarry Savanna, Big Savanna	91-10-10	L	6
Apantesis nais/vittata	Mixed, -	91-08-05	L	2
Apantesis nais/vittata	Myrtle Head Savanna, Site 1	91-05-08	L	1
Apantesis nais/vittata	Myrtle Head Savanna, Site 1	91-06-10	L	1
Apantesis nais/vittata	Myrtle Head Savanna, Site 1	91-07-10	L	3
Apantesis nais/vittata	Myrtle Head Savanna, Site 2	91-07-10	L	3
Apantesis nais/vittata	Myrtle Head Savanna, Site 1	91-09-09	L	4
Apantesis nais/vittata	Myrtle Head Savanna, Site 2	91-09-09	L	3
Apantesis nais/vittata	Myrtle Head Savanna, Site 1	91-10-09	L	1
Apantesis nais/vittata	Myrtle Head Savanna, Site 1	92-06-24	L	1
Apantesis nais/vittata	Myrtle Head Savanna, Site 2	92-06-24	L	4
Apantesis nais	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Apantesis nais	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Apantesis nais	Lanier Quarry Savanna, Big Savanna	91-06-11	L	2
Apantesis nais	Myrtle Head Savanna, Site 1	91-06-10	L	1
Apantesis carlotta (of Ferguson)	Green Swamp Preserve, Big Island Savanna	91-08-05	L	3
Apantesis carlotta (of Ferguson)	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Apantesis carlotta (of Ferguson)	Lanier Quarry Savanna, Big Savanna	91-09-10	L	2
Grammia figurata	Angola Creek Flatwoods, Site 1	91-04-13	L	8
Grammia figurata	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Grammia figurata	Angola Creek Flatwoods, Site 1	91-07-11	L	3
Grammia figurata	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Grammia figurata	Angola Creek Flatwoods, Site 1	91-08-06	L	3
Grammia figurata	Mixed, -	91-08-05	L	1
Grammia figurata	Myrtle Head Savanna, Site 1	91-08-05	L	1
Grammia phyllira	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Grammia virgo	Angola Creek Flatwoods, Site 1	91-09-10	L	3

Grammia virgo	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Grammia virgo	Lanier Quarry Savanna, Big Savanna	91-09-10	L	10
Grammia virgo	Lanier Quarry Savanna, -	92-09-01	L	2
Grammia virgo	Myrtle Head Savanna, Site 1	91-05-08	L	3
Grammia virgo	Myrtle Head Savanna, Site 2	91-09-09	L	3
Halysidota tessellaris	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Halysidota tessellaris	Angola Creek Flatwoods, Site 1	91-08-06	L	1
Halysidota tessellaris	Angola Creek Flatwoods, Site 1	91-08-06	L	4
Halysidota tessellaris	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Halysidota tessellaris	Lanier Quarry Savanna, Big Savanna	91-05-09	L	13
Halysidota tessellaris	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Halysidota tessellaris	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Halysidota tessellaris	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Halysidota tessellaris	Lanier Quarry Savanna, -	92-09-01	L	1
Halysidota tessellaris	Mixed, -	91-08-05	L	8
Halysidota tessellaris	Myrtle Head Savanna, Site 1	91-05-08	L	1
Halysidota tessellaris	Myrtle Head Savanna, Site 1	91-07-10	L	1
Halysidota tessellaris	Myrtle Head Savanna, Site 1	91-08-05	O	+
Halysidota tessellaris	Myrtle Head Savanna, Site 2	91-08-05	L	1
Halysidota tessellaris	Myrtle Head Savanna, Site 2	92-09-02	O	+
Cisseps fulvicollis	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Cisseps fulvicollis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Cisseps fulvicollis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Cisseps fulvicollis	Lanier Quarry Savanna, -	92-09-01	L	4
Cisseps fulvicollis	Myrtle Head Savanna, Site 1	91-06-10	L	1
Cisseps fulvicollis	Myrtle Head Savanna, Site 1	91-07-10	L	1
Cisseps fulvicollis	Myrtle Head Savanna, Site 1	91-10-09	L	1
Dasychira tephra	Lanier Quarry Savanna, -	92-09-01	L	+
Dasychira meridionalis?	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Dasychira atrivenosa	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Dasychira atrivenosa	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Dasychira atrivenosa	Myrtle Head Savanna, Site 1	91-07-10	L	1
Dasychira leucophaea?	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Dasychira leucophaea?	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	5
Dasychira leucophaea?	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Dasychira manto	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Dasychira manto	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Dasychira manto	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Dasychira manto	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Dasychira manto	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Dasychira manto	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Dasychira manto	Lanier Quarry Savanna, -	92-09-01	L	+
Dasychira manto	Myrtle Head Savanna, Site 1	91-04-12	L	1
Dasychira manto	Myrtle Head Savanna, Site 2	91-07-10	L	1
Dasychira manto	Myrtle Head Savanna, Site 2	91-09-09	L	1
Dasychira manto	Myrtle Head Savanna, Site 2	92-05-04	L	1
Dasychira manto	Myrtle Head Savanna, Site 1	92-09-02	L	1
Dasychira sp.	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Dasychira sp.	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Dasychira sp.	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Orgyia definita	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Orgyia definita	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Orgyia definita	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Orgyia definita	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Orgyia leucostigma	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Orgyia leucostigma	Angola Creek Flatwoods, Site 2	91-08-06	L	+
Orgyia leucostigma	Angola Creek Flatwoods, Site 2	91-10-10	L	2
Orgyia leucostigma?	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Orgyia leucostigma	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Orgyia leucostigma	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Orgyia leucostigma	Lanier Quarry Savanna, Big Savanna	91-09-10	L	2
Orgyia leucostigma?	Myrtle Head Savanna, Site 1	91-05-08	L	2

Orgyia leucostigma	Myrtle Head Savanna, Site 1	91-06-10	L	2
Orgyia leucostigma	Myrtle Head Savanna, Site 1	91-10-09	L	1
Orgyia leucostigma	Myrtle Head Savanna, Site 1	92-09-02	L	1
Orgyia sp.	Myrtle Head Savanna, Site 2	92-06-24	L	1
Idia americalis	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Idia americalis	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Idia americalis	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	5
Idia americalis	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	2
Idia americalis	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Idia americalis	Lanier Quarry Savanna, -	92-09-01	L	+
Idia americalis	Myrtle Head Savanna, Site 1	91-07-10	L	1
Idia americalis	Myrtle Head Savanna, Site 2	91-07-10	L	1
Idia americalis	Myrtle Head Savanna, Site 2	92-06-24	L	1
Idia aemula	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Idia aemula	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Idia aemula	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Idia aemula	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Idia aemula	Angola Creek Flatwoods, -	91-08-06	B	1
Idia aemula	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Idia aemula	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Idia aemula	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Idia aemula	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Idia aemula	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Idia aemula?	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Idia aemula	Myrtle Head Savanna, Site 2	92-06-24	L	1
Idia rotundalis	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Idia rotundalis	Angola Creek Flatwoods, Bait trail	91-06-11	B	5
Idia rotundalis	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Idia rotundalis	Angola Creek Flatwoods, Site 2	91-06-11	L	4
Idia rotundalis	Angola Creek Flatwoods, Site 1	91-09-10	L	48
Idia rotundalis	Angola Creek Flatwoods, Site 2	91-09-10	L	38
Idia rotundalis	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	4
Idia rotundalis	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Idia rotundalis	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	3
Idia rotundalis?	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Idia rotundalis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	12
Idia rotundalis	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Idia rotundalis	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Idia rotundalis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Idia rotundalis	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Idia rotundalis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	4
Idia rotundalis	Lanier Quarry Savanna, -	92-09-01	L	+
Idia rotundalis	Myrtle Head Savanna, Site 2	91-09-09	L	2
Idia rotundalis	Myrtle Head Savanna, Site 2	92-06-24	L	1
Idia forbesi	Angola Creek Flatwoods, Site 1	91-05-09	L	10
Idia forbesi	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Idia forbesi	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Idia forbesi?	Angola Creek Flatwoods, Site 1	91-10-10	L	1
Idia forbesi	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	3
Idia forbesi	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Idia forbesi?	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Idia forbesi	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Idia forbesi	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Idia forbesi?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	40
Idia forbesi	Lanier Quarry Savanna, Big Savanna	91-07-11	L	16
Idia forbesi	Lanier Quarry Savanna, Big Savanna	91-08-06	L	12
Idia forbesi	Lanier Quarry Savanna, Big Savanna	91-09-10	L	9
Idia forbesi	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Idia forbesi	Lanier Quarry Savanna, -	92-09-01	L	+
Idia forbesi	Myrtle Head Savanna, Site 1	91-05-08	L	22
Idia forbesi	Myrtle Head Savanna, Site 2	91-07-10	L	7
Idia forbesi	Myrtle Head Savanna, Site 2	91-09-09	L	1

Idia julia	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Idia julia?	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Idia julia	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Idia julia	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	2
Idia julia	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Idia julia?	Lanier Quarry Savanna, Big Savanna	91-09-10	L	2
Idia julia?	Myrtle Head Savanna, Site 1	91-05-08	L	1
Idia julia	Myrtle Head Savanna, Site 2	91-07-10	L	2
Idia diminuendis	Angola Creek Flatwoods, Site 1	91-05-09	L	3
Idia diminuendis?	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Idia diminuendis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Idia diminuendis	Lanier Quarry Savanna, Big Savanna	91-08-06	L	4
Idia diminuendis	Myrtle Head Savanna, Site 1	91-05-08	L	3
Idia diminuendis	Myrtle Head Savanna, Site 2	91-09-09	L	1
Idia lubricalis	Angola Creek Flatwoods, Bait trail	91-06-11	B	4
Idia lubricalis	Angola Creek Flatwoods, -	91-07-11	B	+
Idia lubricalis	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Idia lubricalis	Green Swamp Preserve, Shoestring Savanna	91-05-08	B	2
Idia lubricalis	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Idia lubricalis	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Idia lubricalis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Idia lubricalis	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Idia lubricalis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Idia lubricalis?	Myrtle Head Savanna, Site 1	91-09-09	L	1
Idia sp.	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	10
Zanclognatha lituralis	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Zanclognatha lituralis	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Zanclognatha lituralis	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Zanclognatha lituralis	Green Swamp Preserve, Little Island Savanna	92-09-02	L	1
Zanclognatha lituralis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Zanclognatha lituralis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Zanclognatha theralis?	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Zanclognatha cruralis?	Myrtle Head Savanna, Site 2	91-09-09	L	1
Zanclognatha jacchusalis?	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Zanclognatha jacchusalis?	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Chytolita morbidalis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Chytolita petrealis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Chytolita petrealis	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Chytolita petrealis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Chytolita petrealis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Macrochilo hypocritalis	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Macrochilo hypocritalis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Macrochilo hypocritalis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	5
Macrochilo hypocritalis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Macrochilo hypocritalis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	3
Macrochilo hypocritalis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	4
Macrochilo hypocritalis	Lanier Quarry Savanna, -	92-09-01	L	+
Macrochilo hypocritalis	Myrtle Head Savanna, Site 2	91-07-10	L	2
Macrochilo hypocritalis	Myrtle Head Savanna, Site 2	92-06-24	L	2
Macrochilo orciferalis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Macrochilo orciferalis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Macrochilo orciferalis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	5
Macrochilo orciferalis	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Macrochilo orciferalis	Lanier Quarry Savanna, -	92-09-01	L	+
Macrochilo louisiana	Lanier Quarry Savanna, -	92-09-01	L	+
Macrochilo sp.	Lanier Quarry Savanna, Big Savanna	91-08-06	L	6
Phalaenostola larentioides	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Phalaenostola larentioides	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Phalaenostola larentioides?	Myrtle Head Savanna, Site 1	91-09-09	L	1
Tetanolita mynesalis	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Tetanolita mynesalis	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Tetanolita mynesalis	Angola Creek Flatwoods, Site 1	91-06-11	L	2

Tetanolita mynesalis	Angola Creek Flatwoods, Site 2	91-06-11	L	3
Tetanolita mynesalis	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Tetanolita floridana	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Tetanolita floridana	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Tetanolita floridana	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Tetanolita floridana?	Myrtle Head Savanna, Site 1	91-05-08	L	1
Tetanolita floridana	Myrtle Head Savanna, Site 1	92-06-24	L	1
Tetanolita floridana	Myrtle Head Savanna, Site 2	92-06-24	L	2
Tetanolita sp.	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Tetanolita sp.	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Tetanolita sp.	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Tetanolita sp.	Myrtle Head Savanna, Site 1	91-09-09	L	1
Bleptina caradrinalis	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Bleptina caradrinalis	Angola Creek Flatwoods, Site 1	91-05-09	L	17
Bleptina caradrinalis	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Bleptina caradrinalis	Angola Creek Flatwoods, Site 1	91-06-11	L	5
Bleptina caradrinalis	Angola Creek Flatwoods, Site 1	91-07-11	L	4
Bleptina caradrinalis	Angola Creek Flatwoods, Site 1	91-09-10	L	4
Bleptina caradrinalis	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Bleptina caradrinalis	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Bleptina caradrinalis	Green Swamp Preserve, Big Island Savanna	91-08-05	L	+
Bleptina caradrinalis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	3
Bleptina caradrinalis	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Bleptina caradrinalis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	12
Bleptina caradrinalis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Bleptina caradrinalis	Myrtle Head Savanna, Site 1	91-05-08	L	11
Bleptina caradrinalis	Myrtle Head Savanna, Site 1	91-07-10	L	13
Bleptina caradrinalis	Myrtle Head Savanna, Site 2	91-07-10	L	7
Bleptina caradrinalis	Myrtle Head Savanna, Site 1	91-09-09	L	1
Bleptina caradrinalis	Myrtle Head Savanna, Site 2	91-09-09	L	4
Bleptina sp.	Green Swamp Preserve, Big Island Savanna	91-09-09	D	1
Bleptina sp.	Lanier Quarry Savanna, Big Savanna	91-08-06	L	5
Hypenula cacuminalis	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Renia nemoralis	Green Swamp Preserve, Little Island Savanna	92-09-02	L	1
Renia nemoralis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	5
Renia discoloralis	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Renia discoloralis	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Renia discoloralis	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Renia discoloralis	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Renia discoloralis?	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Renia nr. discoloralis	Angola Creek Flatwoods, -	91-08-06	B	1
Renia nr. discoloralis	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Renia nr. discoloralis	Myrtle Head Savanna, Site 2	91-09-09	L	3
Renia fraternalis?	Angola Creek Flatwoods, Site 1	91-04-13	L	5
Renia fraternalis?	Angola Creek Flatwoods, Site 1	91-05-09	L	3
Renia fraternalis?	Angola Creek Flatwoods, Site 1	91-06-11	L	4
Renia fraternalis?	Angola Creek Flatwoods, Site 2	91-06-11	L	8
Renia fraternalis	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Renia fraternalis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Renia fraternalis	Angola Creek Flatwoods, -	91-08-06	B	1
Renia fraternalis?	Angola Creek Flatwoods, Site 1	91-08-06	L	++
Renia fraternalis	Angola Creek Flatwoods, Site 1	91-09-10	L	4
Renia fraternalis	Angola Creek Flatwoods, Site 2	91-09-10	L	9
Renia fraternalis?	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Renia fraternalis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Renia fraternalis?	Green Swamp Preserve, Big Island Savanna	92-05-04	S	3
Renia fraternalis	Lanier Quarry Savanna, Big Savanna	91-04-13	L	3
Renia fraternalis?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	6
Renia fraternalis	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Renia fraternalis?	Myrtle Head Savanna, Site 1	91-05-08	L	5
Renia adspergillus	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Renia adspergillus?	Angola Creek Flatwoods, Site 1	91-09-10	L	8

Renia adspergillus	Angola Creek Flatwoods, Site 2	91-09-10	L	5
Renia adspergillus	Myrtle Head Savanna, Site 1	92-09-02	L	1
Renia sobrialis	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Renia sobrialis	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Renia sobrialis	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Renia sobrialis	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Renia sobrialis?	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Renia sobrialis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Renia sobrialis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Renia sobrialis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	5
Renia sobrialis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	4
Renia sobrialis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	4
Renia sobrialis	Myrtle Head Savanna, Site 1	91-05-08	L	2
Renia sobrialis?	Myrtle Head Savanna, Site 1	91-06-10	L	1
Renia sobrialis	Myrtle Head Savanna, Site 1	91-07-10	L	2
Renia sobrialis	Myrtle Head Savanna, Site 2	91-07-10	L	3
Renia sobrialis	Myrtle Head Savanna, Site 2	91-09-09	L	1
Renia sobrialis	Myrtle Head Savanna, Site 1	92-09-02	L	2
Renia sp.	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Renia sp.	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Renia sp.	Green Swamp Preserve, Big Island Savanna	92-06-24	L	3
Renia sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Renia sp.	Lanier Quarry Savanna, -	92-09-01	L	+
Renia sp.	Myrtle Head Savanna, Site 2	92-06-24	L	1
Lascoria ambigualis	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Lascoria ambigualis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	3
Palthis angulalis	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Palthis angulalis	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Palthis angulalis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Palthis asopialis	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Palthis asopialis	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Palthis asopialis	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Palthis asopialis	Lanier Quarry Savanna, -	92-09-01	L	+
Palthis asopialis	Myrtle Head Savanna, Site 1	91-05-08	L	1
Redectis vitrea	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Melanomma auricintaria	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Melanomma auricintaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Hypenodes fractilinea?	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Hypenodes fractilinea?	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Hypenodes fractilinea?	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Hypenodes fractilinea?	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Hypenodes fractilinea?	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	2
Hypenodes sp.	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Hypenodes sp.	Angola Creek Flatwoods, Site 2	91-10-10	L	2
Hypenodes sp.	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Schrankia macula	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Schrankia macula	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Schrankia macula	Angola Creek Flatwoods, Site 2	91-09-10	L	5
Schrankia macula	Angola Creek Flatwoods, Site 1	91-10-10	L	4
Schrankia macula	Angola Creek Flatwoods, Site 2	91-10-10	L	5
Schrankia macula	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Schrankia macula	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Schrankia macula	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Schrankia macula	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Schrankia macula	Lanier Quarry Savanna, Big Savanna	91-09-10	L	3
Schrankia macula	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Schrankia macula	Lanier Quarry Savanna, -	92-09-01	L	+
Schrankia macula	Myrtle Head Savanna, Site 1	91-06-10	L	1
Schrankia macula	Myrtle Head Savanna, Site 1	91-07-10	L	1
Schrankia macula	Myrtle Head Savanna, Site 2	91-09-09	L	2
Ablemma n. sp.	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Ablemma n. sp.	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1

Nigetia formosalis	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Bomolocha manalis	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Bomolocha baltimoralis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Bomolocha baltimoralis	Myrtle Head Savanna, Site 2	91-07-10	L	1
Bomolocha bijugalis	Mixed, -	91-08-05	L	1
Lomanaltes eductalis	Lanier Quarry Savanna, -	92-09-01	L	+
Ophiuche minualis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Plathypena scabra	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Plathypena scabra	Green Swamp Preserve, Big Island Savanna	91-09-09	D	1
Plathypena scabra	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Plathypena scabra	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Plathypena scabra	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Plathypena scabra	Lanier Quarry Savanna, -	92-09-01	L	+
Hemeroplanis scopulepes	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Hemeroplanis scopulepes	Myrtle Head Savanna, Site 2	91-09-09	L	1
Phytometra rhodarialis	Angola Creek Flatwoods, Site 1	91-04-13	L	6
Phytometra rhodarialis	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Phytometra rhodarialis	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Phytometra rhodarialis	Angola Creek Flatwoods, Site 1	91-07-11	L	4
Phytometra rhodarialis	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Phytometra rhodarialis	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Phytometra rhodarialis	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Phytometra rhodarialis	Green Swamp Preserve, Little Island Savanna	91-06-11	D	3
Phytometra rhodarialis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	8
Phytometra rhodarialis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Phytometra rhodarialis	Green Swamp Preserve, Big Island Savanna	92-06-24	L	3
Phytometra rhodarialis	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Phytometra rhodarialis	Green Swamp Preserve, Little Island Savanna	92-09-02	L	1
Phytometra rhodarialis	Lanier Quarry Savanna, Big Savanna	91-04-13	L	13
Phytometra rhodarialis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	7
Phytometra rhodarialis	Lanier Quarry Savanna, Big Savanna	91-06-11	L	3
Phytometra rhodarialis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	12
Phytometra rhodarialis	Lanier Quarry Savanna, Big Savanna	91-08-06	L	25
Phytometra rhodarialis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	4
Phytometra rhodarialis	Lanier Quarry Savanna, -	92-09-01	L	+
Phytometra rhodarialis	Myrtle Head Savanna, Site 1	91-04-12	L	8
Phytometra rhodarialis	Myrtle Head Savanna, Site 1	91-05-08	L	11
Phytometra rhodarialis	Myrtle Head Savanna, Site 1	91-06-10	L	3
Phytometra rhodarialis	Myrtle Head Savanna, Site 1	91-07-10	L	1
Phytometra rhodarialis	Myrtle Head Savanna, Site 2	91-07-10	L	1
Phytometra rhodarialis	Myrtle Head Savanna, Site 2	91-07-10	L	7
Phytometra rhodarialis	Myrtle Head Savanna, Site 1	91-09-09	L	6
Phytometra rhodarialis	Myrtle Head Savanna, Site 1	92-05-04	L	7
Phytometra rhodarialis	Myrtle Head Savanna, Site 1	92-06-24	L	7
Pangrapta decoralis	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Pangrapta decoralis	Angola Creek Flatwoods, Site 1	91-05-09	L	5
Pangrapta decoralis	Angola Creek Flatwoods, Site 1	91-06-11	L	4
Pangrapta decoralis	Angola Creek Flatwoods, Site 2	91-06-11	L	6
Pangrapta decoralis	Angola Creek Flatwoods, Site 1	91-07-11	L	7
Pangrapta decoralis	Angola Creek Flatwoods, Site 2	91-07-11	L	5
Pangrapta decoralis	Angola Creek Flatwoods, -	91-08-06	B	1
Pangrapta decoralis	Angola Creek Flatwoods, Site 1	91-08-06	L	+
Pangrapta decoralis	Angola Creek Flatwoods, Site 2	91-08-06	L	+
Pangrapta decoralis	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Pangrapta decoralis	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Pangrapta decoralis	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Pangrapta decoralis	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	3
Pangrapta decoralis	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Pangrapta decoralis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	9
Pangrapta decoralis	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	2
Pangrapta decoralis	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Pangrapta decoralis	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+

Pangrapta decoralis	Green Swamp Preserve, Big Island Savanna	92-06-24	L	4
Pangrapta decoralis	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Pangrapta decoralis	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Pangrapta decoralis	Lanier Quarry Savanna, Big Savanna	91-05-09	L	8
Pangrapta decoralis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	4
Pangrapta decoralis	Lanier Quarry Savanna, Big Savanna	91-08-06	L	4
Pangrapta decoralis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Pangrapta decoralis	Lanier Quarry Savanna, -	92-09-01	L	+
Pangrapta decoralis	Myrtle Head Savanna, Site 1	91-07-10	L	2
Pangrapta decoralis	Myrtle Head Savanna, Site 2	91-07-10	L	5
Pangrapta decoralis	Myrtle Head Savanna, Site 1	92-09-02	L	1
Ledaea perditalis	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Metalectra discalis	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Metalectra discalis	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Metalectra discalis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Metalectra discalis	Angola Creek Flatwoods, -	91-08-06	B	2
Metalectra discalis	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Metalectra discalis	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	3
Metalectra discalis	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Metalectra discalis	Green Swamp Preserve, Big Island Savanna	92-05-04	B	1
Metalectra discalis	Myrtle Head Savanna, Site 2	91-07-10	L	1
Metalectra discalis/quadrisignata	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Metalectra quadrisignata	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Metalectra quadrisignata	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Metalectra quadrisignata	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Metalectra quadrisignata	Green Swamp Preserve, Big Island Savanna	92-09-02	B	1
Metalectra quadrisignata	Myrtle Head Savanna, Site 1	91-07-10	L	1
Metalectra tantillus?	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Metalectra tantillus?	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Metalectra tantillus?	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Metalectra tantillus	Myrtle Head Savanna, Site 1	91-07-10	L	1
Metalectra richardsi	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Arugisa latiorella	Angola Creek Flatwoods, Site 1	91-06-11	L	4
Arugisa latiorella	Angola Creek Flatwoods, Site 2	91-06-11	L	2
Arugisa latiorella	Angola Creek Flatwoods, Site 1	91-09-10	L	3
Arugisa latiorella	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Arugisa latiorella	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	2
Arugisa latiorella	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Arugisa latiorella	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Arugisa latiorella	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Arugisa latiorella	Lanier Quarry Savanna, Big Savanna	91-06-11	L	13
Arugisa latiorella	Lanier Quarry Savanna, Big Savanna	91-08-06	L	10
Arugisa latiorella	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Arugisa latiorella	Lanier Quarry Savanna, -	92-09-01	L	+
Arugisa latiorella	Myrtle Head Savanna, Site 1	91-06-10	L	3
Arugisa latiorella	Myrtle Head Savanna, Site 1	92-06-24	L	1
Scolecocampa liburna	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Scolecocampa liburna	Lanier Quarry Savanna, -	92-09-01	L	+
Gabara distema humeralis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Gabara distema humeralis	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Gabara distema humeralis	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Gabara distema humeralis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Gabara distema humeralis	Green Swamp Preserve, Big Island Savanna	92-06-24	L	5
Gabara distema humeralis	Green Swamp Preserve, Little Island Savanna	92-06-24	L	4
Gabara distema humeralis	Green Swamp Preserve, Little Island Savanna	92-09-02	L	3
Gabara distema humeralis	Lanier Quarry Savanna, Big Savanna	91-07-11	L	7
Gabara distema humeralis	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Gabara distema humeralis	Myrtle Head Savanna, Site 1	91-07-10	L	13
Gabara distema humeralis	Myrtle Head Savanna, Site 2	91-07-10	L	9
Gabara distema humeralis	Myrtle Head Savanna, Site 1	91-09-09	L	1
Gabara distema humeralis	Myrtle Head Savanna, Site 1	92-06-24	L	3
Gabara pulverosalis	Angola Creek Flatwoods, Site 1	91-06-11	L	6

Gabara pulverosalis	Angola Creek Flatwoods, Site 2	91-06-11	L	5
Gabara pulverosalis	Angola Creek Flatwoods, Site 2	91-07-11	L	32
Gabara pulverosalis	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	5
Gabara sp.	Angola Creek Flatwoods, Site 1	91-07-11	L	5
Gabara sp.	Angola Creek Flatwoods, Site 1	91-08-06	L	+
Gabara sp.	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Gabara sp.	Angola Creek Flatwoods, Site 2	91-07-11	L	3
Gabara sp.	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Gabara sp.	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	4
Gabara sp.	Green Swamp Preserve, Big Island Savanna	91-08-05	L	4
Gabara sp.	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Gabara sp.	Lanier Quarry Savanna, Big Savanna	91-08-06	L	7
Gabara spp.	Lanier Quarry Savanna, -	92-09-01	L	+
Phyprosopus callitrichoides	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Phyprosopus callitrichoides	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Phyprosopus callitrichoides	Lanier Quarry Savanna, -	92-09-01	L	+
Phyprosopus callitrichoides	Myrtle Head Savanna, Site 2	91-07-10	L	1
Phyprosopus callitrichoides	Myrtle Head Savanna, Site 2	92-06-24	L	1
Hypsoropha monilis	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Hypsoropha monilis	Green Swamp Preserve, Big Island Savanna	92-05-04	B	1
Hypsoropha monilis	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Hypsoropha hormos	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Hypsoropha hormos	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Hypsoropha hormos	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Hypsoropha hormos	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Hypsoropha hormos	Lanier Quarry Savanna, -	92-09-01	L	+
Hypsoropha hormos	Myrtle Head Savanna, Site 2	91-07-10	L	1
Plusiodonta compressipalpis	Lanier Quarry Savanna, -	92-09-01	L	+
Plusiodonta compressipalpis	Myrtle Head Savanna, Site 2	91-07-10	L	1
Dipthera festiva	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Dipthera festiva	Myrtle Head Savanna, Site 1	91-05-08	L	2
Dipthera festiva	Myrtle Head Savanna, Site 1	91-07-10	L	2
Dipthera festiva	Myrtle Head Savanna, Site 1	91-09-09	L	5
Dipthera festiva	Myrtle Head Savanna, Site 2	91-09-09	L	9
Anticarsia gemmatilis	Angola Creek Flatwoods, -	91-10-10	B	+
Anticarsia gemmatilis	Angola Creek Flatwoods, Site 1	91-10-10	L	2
Anticarsia gemmatilis	Angola Creek Flatwoods, Site 2	91-10-10	L	3
Anticarsia gemmatilis	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Anticarsia gemmatilis	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Anticarsia gemmatilis	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	10
Anticarsia gemmatilis	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Anticarsia gemmatilis	Myrtle Head Savanna, Site 1	91-09-09	L	4
Anticarsia gemmatilis	Myrtle Head Savanna, Site 2	91-09-09	L	1
Anticarsia gemmatilis	Myrtle Head Savanna, Site 1	91-10-09	L	5
Anticarsia gemmatilis	Myrtle Head Savanna, Site 2	91-10-09	L	1
Panopoda rufimargo	Angola Creek Flatwoods, Site 1	91-05-09	L	7
Panopoda rufimargo	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Panopoda rufimargo	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Panopoda rufimargo	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Panopoda rufimargo	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Panopoda rufimargo	Lanier Quarry Savanna, -	92-09-01	L	+
Panopoda rufimargo	Myrtle Head Savanna, Site 1	91-05-08	L	1
Panopoda rufimargo	Myrtle Head Savanna, Site 2	91-07-10	L	1
Panopoda carneicosta	Lanier Quarry Savanna, -	92-09-01	L	+
Cissusa spadix	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Synedoida grandirena	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Synedoida grandirena	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Synedoida grandirena	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Lesmone detrahens	Angola Creek Flatwoods, -	91-08-06	B	1
Lesmone detrahens	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Lesmone detrahens	Myrtle Head Savanna, Site 1	91-05-08	L	1
Lesmone detrahens	Myrtle Head Savanna, Site 1	91-07-10	L	2

Lesmone detrahens	Myrtle Head Savanna, Site 1	91-09-09	L	1
Lesmone detrahens	Myrtle Head Savanna, Site 1	92-05-04	L	2
Lesmone detrahens	Myrtle Head Savanna, Site 2	92-06-24	L	1
Pseudanthracia coracias	Green Swamp Preserve, Big Island Savanna	92-05-04	B	1
Zale lunata	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Zale lunata	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Zale lunata	Angola Creek Flatwoods, -	91-07-11	B	+
Zale lunata	Angola Creek Flatwoods, -	91-08-06	B	3
Zale lunata	Angola Creek Flatwoods, -	91-10-10	B	+
Zale lunata	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	+
Zale lunata	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	+
Zale lunata	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Zale lunata	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Zale lunata	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Zale lunata	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Zale lunata	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Zale lunata	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Zale lunata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Zale lunata	Lanier Quarry Savanna, -	92-09-01	L	+
Zale lunata	Mixed, -	91-08-05	L	1
Zale lunata	Myrtle Head Savanna, Site 1	92-06-24	L	1
Zale aeruginosa	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Zale aeruginosa	Angola Creek Flatwoods, -	91-07-11	B	1
Zale aeruginosa	Green Swamp Preserve, Shoestring Savanna	91-04-12	B	2
Zale aeruginosa	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Zale aeruginosa	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	2
Zale aeruginosa	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Zale aeruginosa	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Zale aeruginosa	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Zale aeruginosa	Myrtle Head Savanna, Site 2	91-07-10	L	2
Zale minerea	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Zale minerea	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Zale obliqua (of Forbes)	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Zale squamularis/obliqua	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	4
Zale squamularis/obliqua	Lanier Quarry Savanna, Big Savanna	91-04-13	L	3
Zale nr. obliqua	Green Swamp Preserve, Big Island Savanna	92-05-04	B	1
Zale buchholzi	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Zale buchholzi	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Zale buchholzi	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Zale horrida	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Zale horrida	Angola Creek Flatwoods, -	91-07-11	B	+
Zale horrida	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Zale horrida	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	+
Zale horrida	Mixed, -	91-08-05	L	1
Allotria elonympha	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Allotria elonympha	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Allotria elonympha	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Allotria elonympha	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Allotria elonympha	Angola Creek Flatwoods, -	91-08-06	B	7
Allotria elonympha	Angola Creek Flatwoods, -	91-08-06	B	1
Allotria elonympha	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	12
Allotria elonympha	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	4
Allotria elonympha	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	2
Allotria elonympha	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Allotria elonympha	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Allotria elonympha	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Allotria elonympha	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Allotria elonympha	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Allotria elonympha	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Allotria elonympha	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Allotria elonympha	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Allotria elonympha	Mixed, -	91-08-05	L	7

Dysgonia smithii	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Dysgonia smithii	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Dysgonia smithii	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Dysgonia smithii	Green Swamp Preserve, Shoestring Savanna	91-04-12	B/D	2
Dysgonia smithii	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Dysgonia smithii	Lanier Quarry Savanna, -	92-09-01	L	+
Dysgonia smithii	Myrtle Head Savanna, Site 1	91-09-09	L	1
Parallelia bistriaris	Angola Creek Flatwoods, -	91-06-11	B	+
Parallelia bistriaris	Angola Creek Flatwoods, -	91-07-11	B	+
Parallelia bistriaris	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Parallelia bistriaris	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Parallelia bistriaris	Green Swamp Preserve, Shoestring Savanna	91-05-08	B	1
Parallelia bistriaris	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Parallelia bistriaris	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	+
Parallelia bistriaris	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	+
Parallelia bistriaris	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	2
Parallelia bistriaris	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Parallelia bistriaris	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Parallelia bistriaris	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Parallelia bistriaris	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Parallelia bistriaris	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Parallelia bistriaris	Lanier Quarry Savanna, Big Savanna	91-08-06	L	3
Parallelia bistriaris	Myrtle Head Savanna, Site 1	91-05-08	L	3
Parallelia bistriaris	Myrtle Head Savanna, Site 1	91-07-10	L	5
Parallelia bistriaris	Myrtle Head Savanna, Site 2	91-07-10	L	3
Parallelia bistriaris	Myrtle Head Savanna, Site 1	91-09-09	L	1
Cutina albopunctella?	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Cutina albopunctella?	Green Swamp Preserve, Big Island Savanna	92-06-24	S	1
Cutina albopunctella?	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Cutina albopunctella?	Myrtle Head Savanna, Site 1	91-07-10	L	2
Cutina albopunctella?	Myrtle Head Savanna, Site 2	91-07-10	L	1
Cutina albopunctella?	Myrtle Head Savanna, Site 1	92-06-24	L	1
Cutina albopunctella?	Myrtle Head Savanna, Site 2	92-06-24	L	4
Cutina distincta	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	1
Cutina distincta	Lanier Quarry Savanna, -	92-09-01	L	+
Caenurgia chloropha	Angola Creek Flatwoods, Site 1	91-06-11	L	2
Caenurgia chloropha	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Caenurgia chloropha	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Caenurgia chloropha	Angola Creek Flatwoods, Site 2	91-10-10	L	2
Caenurgia chloropha	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Caenurgia chloropha	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Caenurgia chloropha	Green Swamp Preserve, Big Island Savanna	91-08-05	L	3
Caenurgia chloropha	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Caenurgia chloropha	Lanier Quarry Savanna, -	92-09-01	L	+
Caenurgia chloropha	Myrtle Head Savanna, Site 1	91-07-10	L	3
Caenurgia chloropha	Myrtle Head Savanna, Site 2	91-10-09	L	1
Mocis latipes	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Mocis latipes	Angola Creek Flatwoods, Site 1	91-10-10	L	1
Mocis latipes?	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Mocis latipes	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Mocis latipes	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	6
Mocis latipes	Myrtle Head Savanna, Site 2	91-10-09	L	1
Mocis marcida	Myrtle Head Savanna, Site 1	91-05-08	L	1
Mocis marcida	Myrtle Head Savanna, Site 2	91-09-09	L	1
Mocis texana/marcida	Green Swamp Preserve, Big Island Savanna	91-08-05	L	3
Mocis texana/marcida	Myrtle Head Savanna, Site 1	91-09-09	L	3
Mocis texana/marcida	Myrtle Head Savanna, Site 2	91-09-09	L	1
Mocis texana	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Mocis texana	Angola Creek Flatwoods, -	91-08-06	B	1
Mocis texana	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Mocis texana	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Mocis texana	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1

Mocis texana?	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	3
Mocis texana	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Mocis texana?	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Mocis texana	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Mocis texana	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Mocis texana	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Mocis texana	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Mocis texana	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Mocis texana	Lanier Quarry Savanna, -	92-09-01	L	+
Mocis texana	Myrtle Head Savanna, Site 1	91-07-10	L	1
Mocis texana	Myrtle Head Savanna, Site 2	91-07-10	L	9
Mocis texana	Myrtle Head Savanna, Site 2	91-09-09	L	1
Mocis texana	Myrtle Head Savanna, Site 1	91-10-09	L	2
Mocis texana	Myrtle Head Savanna, Site 2	91-10-09	L	1
Mocis texana	Myrtle Head Savanna, Site 1	92-05-04	L	1
Celiptera frustulum	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Argyrostrotis flavistriaria	Angola Creek Flatwoods, Site 1	91-04-13	L	3
Argyrostrotis flavistriaria	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Argyrostrotis flavistriaria	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Argyrostrotis flavistriaria	Angola Creek Flatwoods, -	91-08-06	B	2
Argyrostrotis flavistriaria	Angola Creek Flatwoods, Site 1	91-09-10	L	3
Argyrostrotis flavistriaria	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	14
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-05-08	B	1
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	12
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	2
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	13
Argyrostrotis flavistriaria	Green Swamp Preserve, Big Island Savanna	91-08-05	L	6
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	4
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	8
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	3
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Argyrostrotis flavistriaria	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Argyrostrotis flavistriaria	Green Swamp Preserve, Big Island Savanna	92-05-04	B	+
Argyrostrotis flavistriaria	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Argyrostrotis flavistriaria	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Argyrostrotis flavistriaria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	2
Argyrostrotis flavistriaria	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Argyrostrotis flavistriaria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Argyrostrotis flavistriaria	Green Swamp Preserve, Little Island Savanna	92-09-02	L	2
Argyrostrotis flavistriaria	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Argyrostrotis flavistriaria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Argyrostrotis flavistriaria	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Argyrostrotis flavistriaria	Lanier Quarry Savanna, Big Savanna	91-08-06	L	8
Argyrostrotis flavistriaria	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Argyrostrotis flavistriaria	Lanier Quarry Savanna, -	92-09-01	L	+
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 1	91-05-08	L	5
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 1	91-06-10	L	1
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 1	91-07-10	L	10
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 2	91-07-10	L	11
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 1	91-09-09	L	1
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 2	91-09-09	L	1
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 1	91-10-09	L	1
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 1	92-06-24	L	1
Argyrostrotis flavistriaria	Myrtle Head Savanna, Site 2	92-06-24	L	2
Argyrostrotis sylvarum	Angola Creek Flatwoods, Site 1	91-04-13	L	9
Argyrostrotis sylvarum	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Argyrostrotis sylvarum	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Argyrostrotis sylvarum	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	5
Argyrostrotis sylvarum	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	7
Argyrostrotis sylvarum	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1

Argyrostrotis sylvarum	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Argyrostrotis sylvarum	Green Swamp Preserve, Big Island Savanna	91-08-05	L	10
Argyrostrotis sylvarum	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Argyrostrotis sylvarum	Green Swamp Preserve, Big Island Savanna	92-05-04	S	2
Argyrostrotis sylvarum	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Argyrostrotis sylvarum	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Argyrostrotis sylvarum	Green Swamp Preserve, Big Island Savanna	92-06-24	L	2
Argyrostrotis sylvarum	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Argyrostrotis sylvarum	Green Swamp Preserve, Little Island Savanna	92-06-24	L	5
Argyrostrotis sylvarum	Green Swamp Preserve, Little Island Savanna	92-09-02	L	1
Argyrostrotis sylvarum	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Argyrostrotis sylvarum	Lanier Quarry Savanna, Big Savanna	91-05-09	L	14
Argyrostrotis sylvarum	Lanier Quarry Savanna, Big Savanna	91-06-11	L	2
Argyrostrotis sylvarum	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Argyrostrotis sylvarum	Lanier Quarry Savanna, Big Savanna	91-08-06	L	4
Argyrostrotis sylvarum	Lanier Quarry Savanna, -	92-09-01	L	+
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 1	91-04-12	L	2
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 1	91-05-08	L	2
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 1	91-06-10	L	2
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 1	91-09-09	L	1
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 2	91-09-09	L	1
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 1	92-06-24	L	1
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 2	92-06-24	L	2
Argyrostrotis sylvarum	Myrtle Head Savanna, Site 1	92-09-02	L	1
Argyrostrotis erasa	Angola Creek Flatwoods, Site 1	91-04-13	L	4
Argyrostrotis erasa	Angola Creek Flatwoods, Site 1	91-05-09	L	11
Argyrostrotis erasa	Angola Creek Flatwoods, Site 2	91-06-11	L	3
Argyrostrotis erasa	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Argyrostrotis erasa	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	3
Argyrostrotis erasa	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	4
Argyrostrotis erasa	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Argyrostrotis erasa?	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Argyrostrotis erasa	Green Swamp Preserve, Little Island Savanna	92-05-04	L	8
Argyrostrotis erasa	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Argyrostrotis erasa	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Argyrostrotis erasa	Lanier Quarry Savanna, Big Savanna	91-05-09	L	15
Argyrostrotis erasa	Lanier Quarry Savanna, Big Savanna	91-06-11	L	2
Argyrostrotis erasa	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Argyrostrotis erasa	Myrtle Head Savanna, Site 1	91-04-12	L	3
Argyrostrotis erasa	Myrtle Head Savanna, Site 1	91-05-08	L	3
Argyrostrotis erasa	Myrtle Head Savanna, Site 1	91-06-10	L	1
Argyrostrotis erasa	Myrtle Head Savanna, Site 1	92-05-04	L	2
Argyrostrotis erasa	Myrtle Head Savanna, Site 1	92-06-24	L	1
Argyrostrotis erasa	Myrtle Head Savanna, Site 2	92-06-24	L	1
Argyrostrotis quadrifilaris	Green Swamp Preserve, Shoestring Savanna	91-04-12	D	1
Argyrostrotis quadrifilaris	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Argyrostrotis quadrifilaris	Lanier Quarry Savanna, Big Savanna	91-05-09	D	3
Argyrostrotis deleta	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Argyrostrotis deleta	Angola Creek Flatwoods, Site 2	91-06-11	L	3
Argyrostrotis deleta	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Argyrostrotis deleta	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Argyrostrotis deleta	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	3
Argyrostrotis deleta	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	4
Argyrostrotis deleta	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Argyrostrotis deleta	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Argyrostrotis deleta	Lanier Quarry Savanna, Big Savanna	91-04-13	L	4
Argyrostrotis deleta	Lanier Quarry Savanna, Big Savanna	91-05-09	L	7
Argyrostrotis deleta	Lanier Quarry Savanna, Big Savanna	91-06-11	L	3
Argyrostrotis deleta	Lanier Quarry Savanna, Big Savanna	91-08-06	L	3
Argyrostrotis deleta	Lanier Quarry Savanna, Big Savanna	91-09-10	L	2
Argyrostrotis deleta	Lanier Quarry Savanna, -	92-09-01	L	+
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	91-04-12	L	7

Argyrostrotis deleta	Myrtle Head Savanna, Site 1	91-05-08	L	4
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	91-06-10	L	3
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	91-06-11	D	3
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	91-07-10	L	1
Argyrostrotis deleta	Myrtle Head Savanna, Site 2	91-07-10	L	1
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	91-09-09	L	5
Argyrostrotis deleta	Myrtle Head Savanna, Site 2	91-09-09	L	3
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	92-05-04	L	1
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	92-06-24	L	4
Argyrostrotis deleta	Myrtle Head Savanna, Site 2	92-06-24	L	4
Argyrostrotis deleta	Myrtle Head Savanna, Site 1	92-09-02	L	2
Argyrostrotis sp.	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Argyrostrotis sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Argyrostrotis sp.	Lanier Quarry Savanna, -	92-09-01	L	+
Doryodes n. sp.	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Doryodes n. sp.	Angola Creek Flatwoods, Site 1	91-06-11	L	4
Doryodes n. sp.	Angola Creek Flatwoods, Site 2	91-06-11	L	9
Doryodes n. sp.	Angola Creek Flatwoods, -	91-10-10	B	1
Doryodes n. sp.	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	11
Doryodes n. sp.	Green Swamp Preserve, Deer Island Savanna	91-06-11	D	+
Doryodes n. sp.	Green Swamp Preserve, Little Island Savanna	91-06-11	D	1
Doryodes n. sp.	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Doryodes n. sp.	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	4
Doryodes n. sp.	Green Swamp Preserve, Big Island Savanna	92-06-24	L	9
Doryodes n. sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Doryodes n. sp.?	Green Swamp Preserve, Little Island Savanna	92-09-02	L	2
Doryodes n. sp.	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Doryodes n. sp.	Lanier Quarry Savanna, Big Savanna	91-10-10	L	2
Doryodes n. sp.	Myrtle Head Savanna, Site 1	92-06-24	L	4
Catocala muliercula	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Catocala muliercula?	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	+
Catocala muliercula	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	3
Catocala muliercula	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Catocala muliercula	Myrtle Head Savanna, Site 2	91-07-10	L	1
Catocala gracilis	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Catocala gracilis	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	7
Catocala gracilis	Green Swamp Preserve, Big Island Savanna	92-06-24	B	2
Catocala gracilis	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Catocala gracilis	Green Swamp Preserve, Big Island Savanna	92-06-24	S	+
Catocala praeclara	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Catocala praeclara	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Catocala similis	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Catocala similis	Myrtle Head Savanna, Site 2	92-06-24	L	1
Catocala micronympha	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Catocala connubialis	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Argyrogramma verruca	Lanier Quarry Savanna, -	92-09-01	L	+
Enigmogramma basigera (=Argyrogramma b.)	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Argyrogramma basigera	Mixed, -	91-08-05	L	3
Trichoplusia ni	Myrtle Head Savanna, Site 2	91-07-10	L	1
Cteniplusia oxygramma (=Agrapha o.)	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Cteniplusia oxygramma (=Agrapha o.)	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Cteniplusia oxygramma (=Agrapha o.)	Lanier Quarry Savanna, -	92-09-01	L	+
Cteniplusia oxygramma (=Agrapha o.)	Myrtle Head Savanna, Site 2	91-07-10	L	1
Cteniplusia oxygramma (=Agrapha o.)	Myrtle Head Savanna, Site 1	92-09-02	L	1
Pseudoplusia includens	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Pseudoplusia includens	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Pseudoplusia includens	Green Swamp Preserve, Big Island Savanna	91-09-09	D	1
Pseudoplusia includens	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Pseudoplusia includens	Lanier Quarry Savanna, -	92-09-01	L	+
Pseudoplusia includens	Myrtle Head Savanna, -	91-09-09	D	1
Pseudoplusia includens	Myrtle Head Savanna, Site 1	92-09-02	L	2
Pseudoplusia includens	Myrtle Head Savanna, Site 2	92-09-02	L	1

Exyra fax (=rolandiana)	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Exyra fax (=rolandiana)	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Exyra fax (=rolandiana)	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Exyra ridingsii (=nigrocaput)	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Exyra sp.	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Exyra sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Exyra sp.	Myrtle Head Savanna, Site 1	91-09-09	L	1
Exyra sp.	Myrtle Head Savanna, Site 1	92-06-24	L	1
Exyra sp.	Myrtle Head Savanna, Site 2	92-06-24	L	1
Megalographa biloba (=Autographa b.)	Myrtle Head Savanna, Site 1	91-09-09	L	1
Marathyssa inflicta	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Marathyssa inflicta	Lanier Quarry Savanna, Big Savanna	91-06-11	L	3
Paectes pygmaea	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Paectes abrostoloides	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Paectes abrostoloides	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Paectes abrostoloides	Angola Creek Flatwoods, -	91-08-06	B	4
Paectes abrostoloides	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	4
Paectes abrostoloides	Green Swamp Preserve, Big Island Savanna	92-06-24	B	1
Paectes abrostoloides	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Paectes abrostoloides	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Paectes abrostoloides	Lanier Quarry Savanna, -	92-09-01	L	+
Paectes abrostoloides	Myrtle Head Savanna, Site 1	91-07-10	L	1
Paectes abrostoloides	Myrtle Head Savanna, Site 2	91-07-10	L	3
Paectes abrostoloides	Myrtle Head Savanna, Site 2	92-06-24	L	2
Paectes abrostoloides	Myrtle Head Savanna, Site 1	92-09-02	L	4
Baileya ophthalmica	Myrtle Head Savanna, Site 1	92-06-24	L	1
Nycteola frigidana	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Meganola phylla	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Meganola phylla	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Meganola phylla	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Meganola phylla	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Nola pustulata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Nola pustulata	Myrtle Head Savanna, Site 1	91-05-08	L	1
Nola pustulata	Myrtle Head Savanna, Site 1	91-06-10	L	1
Nola sorghiella	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Nola sorghiella	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Nola sorghiella	Lanier Quarry Savanna, -	92-09-01	L	+
Nola sorghiella	Myrtle Head Savanna, Site 2	91-07-10	L	1
Nola sorghiella	Myrtle Head Savanna, Site 1	91-09-09	L	1
Nola clethrae	Angola Creek Flatwoods, Site 1	91-04-13	L	30
Nola clethrae	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Nola clethrae	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Nola clethrae?	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Nola clethrae	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Nola clethrae	Green Swamp Preserve, Little Island Savanna	92-06-24	L	5
Nola clethrae	Lanier Quarry Savanna, Big Savanna	91-04-13	L	8
Nola clethrae?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Nola clethrae	Lanier Quarry Savanna, Big Savanna	91-06-11	L	4
Nola clethrae?	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Nola clethrae?	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Nola clethrae	Myrtle Head Savanna, Site 1	91-06-10	L	3
Nola clethrae?	Myrtle Head Savanna, Site 1	91-07-10	L	1
Nola clethrae?	Myrtle Head Savanna, Site 2	91-07-10	L	1
Nola clethrae?	Myrtle Head Savanna, Site 1	91-09-09	L	3
Nola clethrae?	Myrtle Head Savanna, Site 2	91-09-09	L	3
Nola clethrae?	Myrtle Head Savanna, Site 2	92-06-24	L	7
Oruza albocostaliata	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Hyperstrotia pervertens?	Angola Creek Flatwoods, Site 1	91-05-09	L	3
Hyperstrotia pervertens?	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Hyperstrotia sp.	Angola Creek Flatwoods, Site 1	91-07-11	L	5
Hyperstrotia sp.	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Hyperstrotia sp.	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1

Thioptera nigrofimbria	Angola Creek Flatwoods, Site 2	91-09-10	L	3
Thioptera nigrofimbria	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Thioptera nigrofimbria	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	2
Thioptera nigrofimbria	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Thioptera nigrofimbria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Thioptera nigrofimbria	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Thioptera nigrofimbria	Lanier Quarry Savanna, Big Savanna	91-08-06	L	7
Thioptera nigrofimbria	Lanier Quarry Savanna, -	92-09-01	L	+
Thioptera nigrofimbria	Myrtle Head Savanna, Site 1	91-07-10	L	3
Thioptera nigrofimbria	Myrtle Head Savanna, Site 2	91-07-10	L	1
Thioptera nigrofimbria	Myrtle Head Savanna, Site 1	91-09-09	L	1
Thioptera nigrofimbria	Myrtle Head Savanna, Site 2	91-09-09	L	1
Lithacodia bellicula	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Lithacodia bellicula	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Lithacodia bellicula	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Lithacodia bellicula	Green Swamp Preserve, Big Island Savanna	91-08-05	L	+
Lithacodia bellicula	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Lithacodia bellicula	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Lithacodia bellicula	Green Swamp Preserve, Big Island Savanna	92-06-24	L	6
Lithacodia bellicula	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Lithacodia bellicula	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Lithacodia bellicula	Lanier Quarry Savanna, Big Savanna	91-07-11	L	5
Lithacodia bellicula	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Lithacodia bellicula	Lanier Quarry Savanna, -	92-09-01	L	+
Lithacodia bellicula	Myrtle Head Savanna, Site 1	91-05-08	L	1
Lithacodia bellicula	Myrtle Head Savanna, Site 1	91-07-10	L	26
Lithacodia bellicula	Myrtle Head Savanna, Site 2	91-07-10	L	6
Lithacodia bellicula	Myrtle Head Savanna, Site 1	91-09-09	L	6
Lithacodia bellicula	Myrtle Head Savanna, Site 1	92-05-04	L	3
Lithacodia bellicula	Myrtle Head Savanna, Site 1	92-06-24	L	23
Lithacodia bellicula	Myrtle Head Savanna, Site 2	92-06-24	L	1
Lithacodia muscosula	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Lithacodia muscosula	Myrtle Head Savanna, Site 2	91-07-10	L	1
Homophoberia apicosa	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Homophoberia apicosa	Angola Creek Flatwoods, Bait trail	91-06-11	B	1
Homophoberia apicosa	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Homophoberia apicosa	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Homophoberia apicosa	Green Swamp Preserve, Big Island Savanna	92-09-02	B	1
Leuconycta sp.	Mixed, -	91-08-05	L	1
Amyna octo	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Eumicremma minima	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Eumicremma minima	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Eumicremma minima	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Eumicremma minima	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Eumicremma minima	Myrtle Head Savanna, Site 2	91-09-09	L	3
Tarachidia semiflava	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Tarachidia candefacta	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Bagisara rectifascia	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Panthea "furcilla"	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Panthea "furcilla"	Myrtle Head Savanna, Site 1	91-04-12	L	1
Panthea "furcilla"	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Panthea "furcilla"	Myrtle Head Savanna, Site 1	92-09-02	L	2
Charadra deridens	Myrtle Head Savanna, Site 1	92-09-02	L	1
Acronicta americana	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Acronicta americana	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Acronicta americana	Green Swamp Preserve, Big Island Savanna	92-09-02	B	2
Acronicta americana	Lanier Quarry Savanna, -	92-09-01	L	+
Acronicta tritona	Angola Creek Flatwoods, Site 1	91-04-13	L	8
Acronicta tritona	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Acronicta tritona	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Acronicta tritona	Angola Creek Flatwoods, Site 1	91-07-11	L	5
Acronicta tritona	Angola Creek Flatwoods, Site 2	91-07-11	L	2

Acronicta tritona	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Acronicta tritona	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Acronicta tritona	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Acronicta tritona	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	3
Acronicta tritona	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Acronicta tritona	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	3
Acronicta tritona	Green Swamp Preserve, Big Island Savanna	91-08-05	L	3
Acronicta tritona	Green Swamp Preserve, Big Island Savanna	92-05-04	B	1
Acronicta tritona	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Acronicta tritona	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Acronicta tritona	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Acronicta tritona	Myrtle Head Savanna, Site 1	91-04-12	L	1
Acronicta tritona	Myrtle Head Savanna, Site 2	91-07-10	L	1
Acronicta tritona	Myrtle Head Savanna, Site 1	92-09-02	L	2
Acronicta laetifica	Lanier Quarry Savanna, -	92-09-01	L	+
Acronicta hasta	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Acronicta hasta	Myrtle Head Savanna, Site 1	91-05-08	L	1
Acronicta hasta	Myrtle Head Savanna, Site 1	92-09-02	L	1
Acronicta lobeliae	Angola Creek Flatwoods, Site 1	91-04-13	B	1
Acronicta lobeliae	Lanier Quarry Savanna, -	92-09-01	L	+
Acronicta lobeliae	Myrtle Head Savanna, Site 2	92-09-02	L	1
Acronicta exilis	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Acronicta haesitata?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Acronicta "haesitata"	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Acronicta clarescens	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Acronicta retardata	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Acronicta retardata	Angola Creek Flatwoods, -	91-08-06	B	2
Acronicta afflicta	Lanier Quarry Savanna, -	92-09-01	L	+
Acronicta brumosa	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Acronicta brumosa	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Acronicta brumosa	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Acronicta brumosa	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Acronicta brumosa	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Acronicta brumosa	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Acronicta impleta	Green Swamp Preserve, Big Island Savanna	91-08-05	B	1
Acronicta longa	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Acronicta longa	Angola Creek Flatwoods, -	91-08-06	B	1
Acronicta longa	Green Swamp Preserve, Big Island Savanna	91-08-05	B	1
Acronicta longa	Green Swamp Preserve, Big Island Savanna	92-05-04	B	2
Acronicta longa	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Acronicta longa	Myrtle Head Savanna, Site 1	91-04-12	L	1
Acronicta oblinita	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Acronicta lanceolaria	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Acronicta sinescripta	Lanier Quarry Savanna, -	92-09-01	L	+
Acronicta sinescripta	Myrtle Head Savanna, Site 1	91-05-08	L	1
Acronicta sinescripta	Myrtle Head Savanna, Site 2	92-06-24	L	1
Simyra henrici?	Myrtle Head Savanna, Site 2	91-10-09	L	1
Agriopodes fallax	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Agriopodes fallax	Angola Creek Flatwoods, Site 1	91-08-06	L	1
Agriopodes fallax	Angola Creek Flatwoods, Site 1	91-09-10	L	3
Agriopodes fallax	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Agriopodes fallax	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Agriopodes fallax	Lanier Quarry Savanna, -	92-09-01	L	+
Agriopodes fallax	Mixed, -	91-08-05	L	1
Polygrammate hebraeicum	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Polygrammate hebraeicum	Angola Creek Flatwoods, Site 1	91-05-09	L	5
Polygrammate hebraeicum	Angola Creek Flatwoods, Site 1	91-07-11	L	22
Polygrammate hebraeicum	Angola Creek Flatwoods, Site 2	91-07-11	L	8
Polygrammate hebraeicum	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Polygrammate hebraeicum	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Polygrammate hebraeicum	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Polygrammate hebraeicum	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	13

Polygrammate hebraeicum	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	5
Polygrammate hebraeicum	Green Swamp Preserve, Big Island Savanna	91-08-05	L	4
Polygrammate hebraeicum	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Polygrammate hebraeicum	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Polygrammate hebraeicum	Lanier Quarry Savanna, Big Savanna	91-07-11	L	3
Polygrammate hebraeicum	Lanier Quarry Savanna, Big Savanna	91-08-06	L	6
Polygrammate hebraeicum	Mixed, -	91-08-05	L	10
Polygrammate hebraeicum	Myrtle Head Savanna, Site 1	91-07-10	L	3
Polygrammate hebraeicum	Myrtle Head Savanna, Site 2	91-07-10	L	16
Polygrammate hebraeicum	Myrtle Head Savanna, Site 2	91-07-10	L	17
Polygrammate hebraeicum	Myrtle Head Savanna, Site 2	91-09-09	L	1
Polygrammate hebraeicum	Myrtle Head Savanna, Site 2	91-09-09	O	+
Harrisimemna trisignata	Lanier Quarry Savanna, -	92-09-01	L	+
Eudryas unio	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Eudryas grata	Lanier Quarry Savanna, -	92-09-01	L	+
Spartiniphaga carterae	Angola Creek Flatwoods, Site 1	91-10-10	L	1
Spartiniphaga carterae	Lanier Quarry Savanna, Big Savanna	91-10-10	L	6
Spartiniphaga carterae	Myrtle Head Savanna, Site 1	91-10-09	L	1
Papaipema stenoscelis	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Papaipema speciosissima	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Papaipema appassionata	Myrtle Head Savanna, Site 2	91-10-09	L	1
Iodopepla u-album	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Iodopepla u-album	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Iodopepla u-album	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Iodopepla u-album	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Iodopepla u-album	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Iodopepla u-album	Lanier Quarry Savanna, Big Savanna	91-04-13	L	7
Iodopepla u-album	Lanier Quarry Savanna, Big Savanna	91-06-11	L	2
Iodopepla u-album	Lanier Quarry Savanna, Big Savanna	91-07-11	L	7
Iodopepla u-album	Lanier Quarry Savanna, Big Savanna	91-08-06	L	3
Iodopepla u-album	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Iodopepla u-album	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Iodopepla u-album	Lanier Quarry Savanna, -	92-09-01	L	+
Iodopepla u-album	Myrtle Head Savanna, Site 1	91-04-12	L	4
Iodopepla u-album	Myrtle Head Savanna, Site 1	91-05-08	L	14
Iodopepla u-album	Myrtle Head Savanna, Site 1	91-06-10	L	5
Iodopepla u-album	Myrtle Head Savanna, Site 2	91-07-10	L	8
Iodopepla u-album	Myrtle Head Savanna, Site 1	91-09-09	L	1
Iodopepla u-album	Myrtle Head Savanna, Site 2	91-09-09	L	5
Iodopepla u-album	Myrtle Head Savanna, Site 1	91-10-09	L	2
Iodopepla u-album	Myrtle Head Savanna, Site 2	91-10-09	L	2
Iodopepla u-album	Myrtle Head Savanna, Site 1	92-05-04	L	1
Iodopepla u-album	Myrtle Head Savanna, Site 1	92-09-02	L	1
Phlogophora periculosa	Angola Creek Flatwoods, -	91-10-10	B	1
Phlogophora periculosa	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	3
Phlogophora periculosa	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Phlogophora periculosa	Lanier Quarry Savanna, Big Savanna	91-10-10	L	1
Phlogophora periculosa	Myrtle Head Savanna, Site 1	91-10-09	L	2
Chytonix palliatricula	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Chytonix palliatricula	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Chytonix palliatricula	Angola Creek Flatwoods, Site 2	91-07-11	L	2
Chytonix palliatricula	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Chytonix palliatricula	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Chytonix palliatricula	Lanier Quarry Savanna, Big Savanna	91-05-09	L	4
Chytonix palliatricula	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Chytonix palliatricula	Lanier Quarry Savanna, -	92-09-01	L	+
Chytonix palliatricula	Myrtle Head Savanna, Site 1	91-05-08	L	1
Chytonix palliatricula	Myrtle Head Savanna, Site 2	91-07-10	L	1
Chytonix palliatricula	Myrtle Head Savanna, Site 1	92-06-24	L	1
Nedra ramosula	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Nedra ramosula	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Phosphila turbulenta	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1

Phosphila miselioides	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Phosphila miselioides	Green Swamp Preserve, Big Island Savanna	91-08-05	L	2
Phosphila miselioides	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Phosphila miselioides	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	6
Phosphila miselioides	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Phosphila miselioides	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Phosphila miselioides	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Phosphila miselioides	Lanier Quarry Savanna, -	92-09-01	L	+
Phosphila miselioides	Myrtle Head Savanna, Site 2	92-06-24	L	1
Fagitana littera	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Fagitana littera	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Fagitana littera	Lanier Quarry Savanna, Big Savanna	91-05-09	L	7
Fagitana littera	Lanier Quarry Savanna, Big Savanna	91-08-06	L	3
Callopistria floridensis	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Callopistria mollissima	Green Swamp Preserve, Big Island Savanna	92-09-02	B	1
Callopistria mollissima	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Callopistria mollissima	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Callopistria granitosa	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Callopistria granitosa	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Callopistria granitosa	Lanier Quarry Savanna, -	92-09-01	L	+
Callopistria granitosa	Myrtle Head Savanna, Site 1	92-06-24	L	1
Callopistria cordata	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Callopistria cordata	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Callopistria cordata	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Callopistria cordata	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Callopistria cordata	Myrtle Head Savanna, Site 2	92-06-24	L	1
Acherdoa ferraria	Green Swamp Preserve, Big Island Savanna	92-05-04	S	1
Acherdoa ferraria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Acherdoa ferraria	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Acherdoa ferraria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Acherdoa ferraria	Green Swamp Preserve, Little Island Savanna	92-06-24	L	2
Amphipyra pyramidoides	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Amphipyra pyramidoides	Angola Creek Flatwoods, -	91-08-06	B	4
Amphipyra pyramidoides	Angola Creek Flatwoods, -	91-10-10	B	+
Amphipyra pyramidoides	Angola Creek Flatwoods, Site 1	91-10-10	L	2
Amphipyra pyramidoides	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Amphipyra pyramidoides	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	1
Amphipyra pyramidoides	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Amphipyra pyramidoides	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Amphipyra pyramidoides	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	2
Amphipyra pyramidoides	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	+
Amphipyra pyramidoides	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Amphipyra pyramidoides	Mixed, -	91-08-05	L	2
Amphipyra pyramidoides	Myrtle Head Savanna, Site 1	91-10-09	L	1
Anorthodes tarda	Angola Creek Flatwoods, Site 1	91-04-13	L	6
Anorthodes tarda	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Anorthodes tarda	Lanier Quarry Savanna, Big Savanna	91-04-13	L	3
Anorthodes tarda	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Anorthodes tarda	Myrtle Head Savanna, Site 1	92-05-04	L	1
Balsa malana	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Spodoptera exigua	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Spodoptera exigua	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Spodoptera frugiperda	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Spodoptera frugiperda	Lanier Quarry Savanna, -	92-09-01	L	+
Spodoptera frugiperda	Myrtle Head Savanna, Site 1	92-09-02	L	1
Spodoptera ornithogalli	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Spodoptera ornithogalli	Angola Creek Flatwoods, -	91-08-06	B	1
Spodoptera ornithogalli	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Spodoptera ornithogalli	Angola Creek Flatwoods, Site 2	91-09-10	L	1
Spodoptera ornithogalli	Angola Creek Flatwoods, -	91-10-10	B	+
Spodoptera ornithogalli	Angola Creek Flatwoods, -	91-10-10	B	1
Spodoptera ornithogalli	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1

Spodoptera ornithogalli	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Spodoptera ornithogalli	Lanier Quarry Savanna, -	92-09-01	L	+
Spodoptera ornithogalli	Myrtle Head Savanna, Site 2	91-09-09	L	1
Spodoptera dolichos	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	2
Spodoptera dolichos	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Spodoptera eridania	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	3
Elaphria nucicolora	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Elaphria nucicolora	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Elaphria versicolor	Green Swamp Preserve, Shoestring Savanna	91-06-10	S	4
Elaphria versicolor	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Elaphria versicolor	Lanier Quarry Savanna, -	92-09-01	L	+
Elaphria chalcedonia	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Elaphria chalcedonia	Angola Creek Flatwoods, -	91-08-06	B	5
Elaphria chalcedonia	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	2
Elaphria chalcedonia	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Elaphria chalcedonia	Lanier Quarry Savanna, -	92-09-01	L	+
Elaphria chalcedonia	Myrtle Head Savanna, Site 1	92-06-24	L	1
Elaphria georgei	Angola Creek Flatwoods, Site 1	91-04-13	L	5
Elaphria georgei	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Elaphria festivoides complex	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Elaphria festivoides complex	Angola Creek Flatwoods, Site 1	91-05-09	L	6
Elaphria festivoides complex	Angola Creek Flatwoods, Site 2	91-09-10	L	2
Elaphria grata	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Elaphria grata	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Elaphria grata	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Elaphria grata	Angola Creek Flatwoods, -	91-10-10	B	1
Elaphria grata	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Elaphria grata	Myrtle Head Savanna, Site 1	91-06-10	L	1
Elaphria grata	Myrtle Head Savanna, Site 2	91-07-10	L	2
Galgula partita	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Galgula partita	Angola Creek Flatwoods, Site 1	91-10-10	L	1
Galgula partita	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Galgula partita	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Galgula partita	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Galgula partita	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Galgula partita	Lanier Quarry Savanna, -	92-09-01	L	+
Galgula partita	Myrtle Head Savanna, Site 2	91-09-09	L	1
Galgula partita	Myrtle Head Savanna, Site 1	92-05-04	L	1
Galgula partita	Myrtle Head Savanna, Site 1	92-09-02	L	1
Platysenta videns	Angola Creek Flatwoods, Site 1	91-05-09	L	4
Platysenta videns	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Platysenta videns	Angola Creek Flatwoods, -	91-08-06	B	1
Platysenta videns	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Platysenta videns	Angola Creek Flatwoods, Site 2	91-09-10	L	8
Platysenta videns	Green Swamp Preserve, Shoestring Savanna	91-06-10	B	1
Platysenta videns	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Platysenta videns	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Platysenta videns	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Platysenta videns	Green Swamp Preserve, Big Island Savanna	92-05-04	B	1
Platysenta videns	Green Swamp Preserve, Little Island Savanna	92-06-24	L	1
Platysenta videns	Lanier Quarry Savanna, Big Savanna	91-04-13	L	3
Platysenta videns	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Platysenta videns	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Platysenta videns	Lanier Quarry Savanna, Big Savanna	91-07-11	L	4
Platysenta videns	Lanier Quarry Savanna, Big Savanna	91-08-06	L	2
Platysenta videns	Lanier Quarry Savanna, Big Savanna	91-09-10	L	9
Platysenta videns	Lanier Quarry Savanna, -	92-09-01	L	+
Platysenta videns	Myrtle Head Savanna, Site 1	91-05-08	L	12
Platysenta videns	Myrtle Head Savanna, Site 1	91-06-10	L	3
Platysenta videns	Myrtle Head Savanna, Site 1	91-07-10	L	1
Platysenta videns	Myrtle Head Savanna, Site 2	91-07-10	L	3
Platysenta videns	Myrtle Head Savanna, Site 1	91-09-09	L	5

Platysenta videns	Myrtle Head Savanna, Site 2	91-09-09	L	9
Platysenta mobilis	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	2
Platysenta sutor	Angola Creek Flatwoods, -	91-10-10	B	2
Platysenta sutor	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	6
Platysenta sutor	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	10
Platysenta sutor	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Platysenta sutor	Lanier Quarry Savanna, -	92-09-01	L	+
Platysenta sutor	Myrtle Head Savanna, Site 2	91-09-09	L	1
Platysenta sutor	Myrtle Head Savanna, Site 1	92-09-02	L	3
Condica confederata	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	2
Condica confederata	Lanier Quarry Savanna, -	92-09-01	L	+
Condica confederata	Myrtle Head Savanna, Site 1	92-09-02	L	1
Emarginea percara	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Ogdoconta cinereola	Lanier Quarry Savanna, -	92-09-01	L	+
Stiriodes obtusa	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Stiriodes obtusa	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Stiriodes obtusa	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Stiriodes obtusa	Green Swamp Preserve, Big Island Savanna	92-06-24	L	1
Stiriodes obtusa	Lanier Quarry Savanna, -	92-09-01	L	+
Stiriodes obtusa	Myrtle Head Savanna, Site 1	91-06-10	L	1
Stiriodes obtusa	Myrtle Head Savanna, Site 1	91-07-10	L	1
Amolita fessa	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Amolita fessa	Lanier Quarry Savanna, Big Savanna	91-05-09	L	3
Amolita fessa	Lanier Quarry Savanna, -	92-09-01	L	+
Amolita fessa	Myrtle Head Savanna, Site 1	91-05-08	L	1
Amolita fessa	Myrtle Head Savanna, Site 1	91-09-09	L	7
Amolita obliqua	Lanier Quarry Savanna, -	92-09-01	L	+
Amolita roseola	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Amolita roseola	Green Swamp Preserve, Little Island Savanna	92-05-04	L	5
Amolita roseola	Green Swamp Preserve, Big Island Savanna	92-06-24	L	5
Amolita roseola	Lanier Quarry Savanna, Big Savanna	91-04-13	L	3
Amolita roseola	Lanier Quarry Savanna, Big Savanna	91-05-09	L	9
Amolita roseola	Lanier Quarry Savanna, Big Savanna	91-06-11	L	6
Amolita roseola	Lanier Quarry Savanna, Big Savanna	91-07-11	L	2
Amolita roseola	Lanier Quarry Savanna, Big Savanna	91-08-06	L	18
Amolita roseola	Lanier Quarry Savanna, Big Savanna	91-09-10	L	21
Amolita roseola	Lanier Quarry Savanna, -	92-09-01	L	+
Amolita roseola	Myrtle Head Savanna, Site 1	91-05-08	L	28
Amolita roseola	Myrtle Head Savanna, Site 1	91-06-10	L	14
Amolita roseola	Myrtle Head Savanna, Site 2	91-09-09	L	8
Amolita roseola	Myrtle Head Savanna, Site 1	92-06-24	L	1
Amolita roseola	Myrtle Head Savanna, Site 2	92-06-24	L	5
Amolita roseola	Myrtle Head Savanna, Site 1	92-09-02	L	1
Pseudaletia unipuncta	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Pseudaletia unipuncta	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Pseudaletia unipuncta	Angola Creek Flatwoods, -	91-08-06	B	1
Pseudaletia unipuncta	Angola Creek Flatwoods, -	91-10-10	B	+
Pseudaletia unipuncta	Green Swamp Preserve, Shoestring Savanna	91-04-12	B	+
Pseudaletia unipuncta	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+
Pseudaletia unipuncta	Green Swamp Preserve, Big Island Savanna	92-06-24	B	+
Pseudaletia unipuncta	Lanier Quarry Savanna, -	92-09-01	L	+
Pseudaletia unipuncta	Mixed, -	91-08-05	L	6
Pseudaletia unipuncta	Myrtle Head Savanna, Site 2	91-07-10	L	1
Pseudaletia unipuncta	Myrtle Head Savanna, Site 1	91-09-09	L	3
Pseudaletia unipuncta	Myrtle Head Savanna, Site 2	91-09-09	L	2
Pseudaletia unipuncta	Myrtle Head Savanna, Site 1	91-10-09	L	1
Pseudaletia unipuncta	Myrtle Head Savanna, Site 2	91-10-09	L	2
Pseudaletia unipuncta	Myrtle Head Savanna, Site 1	92-06-24	L	2
Pseudaletia unipuncta	Myrtle Head Savanna, Site 2	92-09-02	L	13
Leucania linda	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Leucania linda?	Myrtle Head Savanna, Site 2	91-09-09	L	1
Leucania latiuscula (of Forbes)	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1

Leucania latiuscula (of Forbes)	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Leucania latiuscula (of Forbes)	Myrtle Head Savanna, Site 2	91-10-09	L	1
Leucania latiuscula (of Forbes)	Myrtle Head Savanna, Site 1	92-09-02	L	1
Leucania scirpicola	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Leucania scirpicola	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Leucania scirpicola	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Leucania scirpicola	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Leucania scirpicola	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Leucania scirpicola	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Leucania scirpicola	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Leucania scirpicola	Myrtle Head Savanna, Site 1	91-04-12	L	1
Leucania scirpicola	Myrtle Head Savanna, Site 1	91-05-08	L	2
Leucania scirpicola	Myrtle Head Savanna, Site 2	92-05-04	L	1
Leucania adjuta	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Leucania adjuta	Angola Creek Flatwoods, Site 1	91-06-11	L	1
Leucania adjuta	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Leucania adjuta	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Leucania adjuta	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Leucania adjuta	Lanier Quarry Savanna, Big Savanna	91-04-13	L	2
Leucania adjuta	Lanier Quarry Savanna, -	92-09-01	L	+
Leucania adjuta	Myrtle Head Savanna, Site 1	91-05-08	L	1
Leucania adjuta	Myrtle Head Savanna, Site 1	92-09-02	L	2
Leucania inermis?	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Leucania inermis?	Myrtle Head Savanna, Site 2	91-07-10	L	1
Leucania inermis/pseuargyria	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Leucania sp.	Lanier Quarry Savanna, -	92-09-01	L	+
Orthosia revicta	Angola Creek Flatwoods, Site 1	91-04-13	S	1
Orthosia revicta	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	1
Egira alternans	Angola Creek Flatwoods, Site 1	91-04-13	L	3
Egira alternans	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Egira alternans	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	7
Egira alternans	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	2
Egira alternans	Green Swamp Preserve, Big Island Savanna	92-05-04	S	2
Egira alternans	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Egira alternans	Green Swamp Preserve, Shoestring Savanna, E. End	92-05-04	L	1
Egira alternans	Lanier Quarry Savanna, Big Savanna	91-04-13	L	7
Egira alternans	Lanier Quarry Savanna, Big Savanna	91-05-09	L	2
Egira alternans	Myrtle Head Savanna, Site 1	91-04-12	L	2
Morrisonia mucens	Myrtle Head Savanna, Site 1	91-04-12	L	1
Morrisonia confusa	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Morrisonia confusa	Myrtle Head Savanna, Site 1	91-04-12	L	1
Morrisonia n. sp.	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Morrisonia n. sp.	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Morrisonia n. sp.	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Morrisonia n. sp.	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Morrisonia n. sp.	Myrtle Head Savanna, Site 1	91-06-10	L	1
Ulololche culea	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Ulolonche modesta	Angola Creek Flatwoods, Site 1	91-04-13	L	15
Ulolonche modesta	Angola Creek Flatwoods, Site 1	91-05-09	L	1
Orthodes crenulata	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Orthodes crenulata	Angola Creek Flatwoods, Site 1	91-05-09	L	2
Orthodes crenulata	Lanier Quarry Savanna, -	92-09-01	L	+
Orthodes crenulata	Myrtle Head Savanna, Site 1	91-04-12	L	1
Orthodes crenulata	Myrtle Head Savanna, Site 1	91-07-10	L	1
Orthodes crenulata	Myrtle Head Savanna, Site 1	91-09-09	L	2
Orthodes crenulata	Myrtle Head Savanna, Site 2	91-09-09	L	1
Orthodes crenulata	Myrtle Head Savanna, Site 2	92-09-02	L	1
Tricholita signata	Myrtle Head Savanna, Site 2	91-10-09	L	1
Agrotis buchholzi	Angola Creek Flatwoods, Site 1	91-04-13	L	7
Agrotis buchholzi	Angola Creek Flatwoods, Site 1	91-06-11	L	2
Agrotis buchholzi	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Agrotis buchholzi	Green Swamp Preserve, Shoestring Savanna	91-04-12	L	5

Agrotis buchholzi	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	6
Agrotis malefida	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Agrotis ipsilon	Angola Creek Flatwoods, Site 1	91-04-13	L	2
Agrotis ipsilon	Angola Creek Flatwoods, -	91-10-10	B	+
Agrotis ipsilon	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Agrotis ipsilon	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Agrotis ipsilon	Lanier Quarry Savanna, Big Savanna	91-04-13	L	1
Agrotis ipsilon	Myrtle Head Savanna, Site 1	91-05-08	L	1
Agrotis ipsilon	Myrtle Head Savanna, Site 1	91-09-09	L	1
Agrotis subterranea	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Agrotis subterranea	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	1
Agrotis subterranea	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	3
Agrotis subterranea	Lanier Quarry Savanna, -	92-09-01	L	+
Feltia geniculata	Angola Creek Flatwoods, Site 1	91-10-10	L	2
Feltia geniculata	Angola Creek Flatwoods, Site 2	91-10-10	L	2
Euagrotis lubricans	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Euagrotis lubricans	Angola Creek Flatwoods, Site 1	91-07-11	L	1
Euagrotis lubricans	Angola Creek Flatwoods, Site 1	91-09-10	L	3
Euagrotis lubricans	Green Swamp Preserve, Shoestring Savanna	91-04-12	B	3
Euagrotis lubricans	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Euagrotis lubricans	Green Swamp Preserve, Shoestring Savanna	91-06-10	L	1
Euagrotis lubricans	Green Swamp Preserve, Shoestring Savanna	91-07-10	L	1
Euagrotis lubricans	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Euagrotis lubricans	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Euagrotis lubricans	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Euagrotis lubricans	Green Swamp Preserve, Little Island Savanna	92-05-04	L	1
Euagrotis lubricans	Lanier Quarry Savanna, Big Savanna	91-04-13	L	3
Euagrotis lubricans	Lanier Quarry Savanna, Big Savanna	91-05-09	L	5
Euagrotis lubricans	Lanier Quarry Savanna, Big Savanna	91-06-11	L	1
Euagrotis lubricans	Lanier Quarry Savanna, Big Savanna	91-07-11	L	4
Euagrotis lubricans	Lanier Quarry Savanna, Big Savanna	91-10-10	L	2
Euagrotis lubricans	Lanier Quarry Savanna, -	92-09-01	L	+
Euagrotis lubricans	Myrtle Head Savanna, Site 1	91-06-10	L	4
Euagrotis lubricans	Myrtle Head Savanna, Site 2	91-07-10	L	6
Euagrotis lubricans	Myrtle Head Savanna, Site 2	91-09-09	L	3
Euagrotis lubricans	Myrtle Head Savanna, Site 2	91-10-09	L	4
Euagrotis lubricans	Myrtle Head Savanna, Site 1	92-05-04	L	1
Euagrotis lubricans	Myrtle Head Savanna, Site 1	92-09-02	L	1
Euagrotis illapsa	Angola Creek Flatwoods, Site 1	91-04-13	L	1
Euagrotis illapsa	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Euagrotis illapsa	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Euagrotis illapsa	Lanier Quarry Savanna, Big Savanna	91-08-06	L	1
Euagrotis sp.	Angola Creek Flatwoods, Site 1	91-07-11	L	2
Euagrotis sp.	Green Swamp Preserve, Big Island Savanna	91-08-05	L	1
Anicla infecta	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	2
Anicla infecta	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	2
Anicla infecta	Lanier Quarry Savanna, -	92-09-01	L	+
Peridroma saucia	Angola Creek Flatwoods, Site 2	91-06-11	L	1
Xestia dolosa	Green Swamp Preserve, Shoestring Savanna	91-05-08	L	1
Xestia dolosa	Lanier Quarry Savanna, -	92-09-01	L	+
Anomogyna elimata ("true")	Angola Creek Flatwoods, Site 1	91-10-10	L	5
Anomogyna elimata	Angola Creek Flatwoods, Site 2	91-10-10	L	1
Anomogyna elimata	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Anomogyna elimata	Lanier Quarry Savanna, Big Savanna	91-10-10	L	5
Anomogyna youngii?	Angola Creek Flatwoods, Site 1	91-10-10	L	1
Anomogyna youngii?	Angola Creek Flatwoods, Site 2	91-10-10	L	3
Anomogyna youngii?	Green Swamp Preserve, Shoestring Savanna	91-10-09	B	1
Anomogyna youngii?	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	3
Anomogyna youngii?	Lanier Quarry Savanna, Big Savanna	91-10-10	L	3
Hemipachnobia s. subporphyrea	Lanier Quarry Savanna, Big Savanna	91-04-13	L	4
Hemipachnobia s. subporphyrea	Lanier Quarry Savanna, Big Savanna	91-05-09	L	1
Heliothis zea	Angola Creek Flatwoods, Site 1	91-07-11	L	7

Heliothis zea	Angola Creek Flatwoods, Site 2	91-07-11	L	7
Heliothis zea	Angola Creek Flatwoods, Site 2	91-07-11	L	1
Heliothis zea	Angola Creek Flatwoods, Site 1	91-09-10	L	1
Heliothis zea	Green Swamp Preserve, Big Island Savanna	91-08-05	L	6
Heliothis zea	Green Swamp Preserve, Shoestring Savanna	91-10-09	L	1
Heliothis zea	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Heliothis zea	Lanier Quarry Savanna, Big Savanna	91-07-11	L	1
Heliothis zea	Lanier Quarry Savanna, Big Savanna	91-08-06	L	3
Heliothis zea	Lanier Quarry Savanna, Big Savanna	91-09-10	L	1
Heliothis zea	Lanier Quarry Savanna, -	92-09-01	L	+
Heliothis zea	Mixed, -	91-08-05	L	30
Heliothis zea	Myrtle Head Savanna, Site 1	91-07-10	L	1
Heliothis zea	Myrtle Head Savanna, Site 2	91-07-10	L	2
Heliothis zea	Myrtle Head Savanna, Site 1	91-08-05	L	45
Heliothis zea	Myrtle Head Savanna, Site 2	91-08-05	O	5
Heliothis zea	Myrtle Head Savanna, Site 2	92-09-02	L	25
Heliothis subflexus	Myrtle Head Savanna, Site 1	92-09-02	L	1
Heliothis virescens	Lanier Quarry Savanna, -	92-09-01	L	+
Schinia nr. bina	Green Swamp Preserve, Big Island Savanna	92-09-02	L	1
Schinia nr. bina	Green Swamp Preserve, Big Island Savanna	92-09-02	L	1
Schinia nr. bina	Lanier Quarry Savanna, -	92-09-01	L	+
Schinia nr. bina	Lanier Quarry Savanna, -	92-09-01	L	1
Schinia arcigera	Myrtle Head Savanna, Site 1	91-10-09	L	1
Schinia rivulosa?	Lanier Quarry Savanna, -	92-09-01	L	1
Schinia nubila	Lanier Quarry Savanna, -	92-09-01	L	+
Schinia trifascia	Angola Creek Flatwoods, Site 1	91-09-10	L	2
Schinia trifascia	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	2
Schinia trifascia	Green Swamp Preserve, Little Island Savanna	92-09-02	L	3
Schinia trifascia	Myrtle Head Savanna, Site 1	91-09-09	L	3
Schinia trifascia	Myrtle Head Savanna, Site 2	91-09-09	L	1
Schinia trifascia	Myrtle Head Savanna, Site 1	92-09-02	L	1
Schinia nundina	Green Swamp Preserve, Shoestring Savanna	91-09-09	L	1
Schinia nundina	Myrtle Head Savanna, Site 1	91-09-09	L	1

Eurytides marcellus	Angola Creek Savanna, -	91-05-10	D	+
Papilio polyxenes asterias	Angola Creek Flatwoods, -	91-05-10	D	+
Papilio polyxenes asterias	Myrtle Head Savanna, -	91-06-11	D	+
Papilio glaucus	Angola Creek Flatwoods, -	91-05-10	D	+
Papilio glaucus	Angola Creek Flatwoods, -	91-08-07	D	+
Papilio glaucus	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Papilio glaucus	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+
Papilio glaucus	Green Swamp Preserve, Shoestring Savanna	91-04-13	D	+
Papilio glaucus	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Papilio glaucus	Lanier Quarry Savanna, Big Savanna	91-07-12	D	+
Papilio glaucus	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Papilio glaucus	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Papilio glaucus	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Papilio glaucus	Myrtle Head Savanna, -	92-06-25	D	+
Papilio troilus	Angola Creek Flatwoods, -	91-07-12	D	+
Papilio troilus	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Papilio troilus	Lanier Quarry Savanna, Big Savanna	91-07-12	D	+
Papilio troilus	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Papilio palamedes	Angola Creek Flatwoods, -	91-04-14	D	+
Papilio palamedes	Angola Creek Flatwoods, -	91-05-10	D	+
Papilio palamedes	Angola Creek Flatwoods, -	91-07-12	D	+
Papilio palamedes	Angola Creek Flatwoods, -	91-08-07	D	+
Papilio palamedes	Angola Creek Flatwoods, -	91-09-11	D	+
Papilio palamedes	Green Swamp Preserve, -	92-05-05	D	+
Papilio palamedes	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Papilio palamedes	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Papilio palamedes	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Papilio palamedes	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Papilio palamedes	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Papilio palamedes	Green Swamp Preserve, Little Island Savanna	92-06-25	D	+
Papilio palamedes	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Papilio palamedes	Green Swamp Preserve, Shoestring Savanna	91-04-13	D	c
Papilio palamedes	Green Swamp Preserve, Shoestring Savanna	91-09-09	D	+
Papilio palamedes	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Papilio palamedes	Lanier Quarry Savanna, Big Savanna	91-04-14	D	+
Papilio palamedes	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Papilio palamedes	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Papilio palamedes	Lanier Quarry Savanna, Big Savanna	91-07-12	D	+
Papilio palamedes	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Papilio palamedes	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Papilio palamedes	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Papilio palamedes	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Papilio palamedes	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Papilio palamedes	Myrtle Head Savanna, -	91-06-11	D	+
Papilio palamedes	Myrtle Head Savanna, -	91-07-11	D	+
Papilio palamedes	Myrtle Head Savanna, -	91-09-10	D	+
Papilio palamedes	Myrtle Head Savanna, -	91-10-10	D	+
Papilio palamedes	Myrtle Head Savanna, -	92-05-04	D	+
Papilio palamedes	Myrtle Head Savanna, -	92-06-25	D	+
Papilio palamedes	Myrtle Head Savanna, -	92-09-03	D	+
Colias eurytheme	Angola Creek Flatwoods, -	91-06-12	D	+
Phoebis sennae eubule	Angola Creek Flatwoods, -	91-08-07	D	+
Phoebis sennae eubule	Angola Creek Flatwoods, -	91-09-11	D	+
Phoebis sennae eubule	Angola Creek Flatwoods, -	91-10-11	D	+
Phoebis sennae eubule	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Phoebis sennae eubule	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Phoebis sennae eubule	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+
Phoebis sennae eubule	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Phoebis sennae eubule	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+

Phoebis sennae eubule	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Phoebis sennae eubule	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Phoebis sennae eubule	Lanier Quarry Savanna, Big Savanna	91-10-11	D	+
Phoebis sennae eubule	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Phoebis sennae eubule	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Phoebis sennae eubule	Myrtle Head Savanna, -	91-09-10	D	+
Phoebis sennae eubule	Myrtle Head Savanna, -	91-10-10	D	+
Phoebis sennae eubule	Myrtle Head Savanna, -	92-09-03	D	+
Eurema lisa	Angola Creek Flatwoods, -	91-09-11	D	+
Eurema lisa	Angola Creek Flatwoods, -	91-10-11	D	+
Eurema lisa	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Eurema lisa	Green Swamp Preserve, Shoestring Savanna	91-09-09	D	+
Eurema lisa	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Eurema lisa	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Eurema lisa	Myrtle Head Savanna, -	91-09-10	D	+
Eurema nicippe	Angola Creek Flatwoods, -	91-04-14	D	+
Eurema nicippe	Angola Creek Flatwoods, -	91-07-12	D	+
Eurema nicippe	Angola Creek Flatwoods, -	91-09-11	D	+
Eurema nicippe	Angola Creek Flatwoods, -	91-10-11	D	+
Eurema nicippe	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Eurema nicippe	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Eurema nicippe	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Eurema nicippe	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Eurema nicippe	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Eurema nicippe	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Eurema nicippe	Myrtle Head Savanna, -	91-07-11	D	+
Eurema nicippe	Myrtle Head Savanna, -	91-09-10	D	+
Eurema nicippe	Myrtle Head Savanna, -	91-10-10	D	+
Eurema nicippe	Myrtle Head Savanna, -	92-06-25	D	+
Eurema nicippe	Myrtle Head Savanna, -	92-09-03	D	+
Atlides halesus	Myrtle Head Savanna, -	91-09-10	D	+
Atlides halesus	Myrtle Head Savanna, -	91-10-10	D	+
Calycopis cecrops	Angola Creek Flatwoods, -	91-09-11	D	+
Calycopis cecrops	Angola Creek Flatwoods, -	91-10-11	D	+
Calycopis cecrops	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Calycopis cecrops	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Calycopis cecrops	Green Swamp Preserve, Shoestring Savanna	91-04-13	D	+
Calycopis cecrops	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Calycopis cecrops	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Calycopis cecrops	Myrtle Head Savanna, -	91-06-11	D	+
Calycopis cecrops	Myrtle Head Savanna, -	92-05-04	D	+
Calycopis cecrops	Myrtle Head Savanna, -	92-06-25	D	+
Calycopis cecrops	Myrtle Head Savanna, -	92-09-03	D	+
Strymon melinus	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Strymon melinus	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Strymon melinus	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Strymon melinus	Myrtle Head Savanna, -	91-06-11	D	+
Strymon melinus	Myrtle Head Savanna, -	91-10-10	D	+
Everes comyntas	Green Swamp Preserve, Deer Island Savanna	91-06-11	D	+
Everes comyntas	Green Swamp Preserve, Little Island Savanna	91-06-10	D	+
Everes comyntas	Myrtle Head Savanna, -	91-06-11	D	+
Celastrina argiolus	Green Swamp Preserve, Shoestring Savanna	91-04-13	D	+
Calephelis virginiensis	Angola Creek Flatwoods, -	91-05-10	D	+
Calephelis virginiensis	Angola Creek Flatwoods, -	91-09-11	D	+
Calephelis virginiensis	Angola Creek Flatwoods, -	91-10-11	D	+
Calephelis virginiensis	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+
Calephelis virginiensis	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Calephelis virginiensis	Lanier Quarry Savanna, Big Savanna	91-07-12	D	+
Calephelis virginiensis	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Calephelis virginiensis	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Calephelis virginiensis	Myrtle Head Savanna, -	91-10-10	D	+
Euptoeita claudia	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+

Euptoeita claudia	Myrtle Head Savanna, -	91-07-11	D	+
Euptoeita claudia	Myrtle Head Savanna, -	91-10-10	D	+
Phyciodes tharos	Green Swamp Preserve, -	92-05-05	D	+
Phyciodes tharos	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Phyciodes tharos	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Phyciodes tharos	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Phyciodes tharos	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Phyciodes tharos	Green Swamp Preserve, Shoestring Savanna	91-04-13	D	+
Phyciodes tharos	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Phyciodes tharos	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+
Phyciodes tharos	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Phyciodes tharos	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Phyciodes tharos	Lanier Quarry Savanna, Big Savanna	91-10-11	D	+
Phyciodes tharos	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Phyciodes tharos	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Phyciodes tharos	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Phyciodes tharos	Myrtle Head Savanna, -	91-06-11	D	+
Phyciodes tharos	Myrtle Head Savanna, -	91-07-11	D	+
Phyciodes tharos	Myrtle Head Savanna, -	91-09-10	D	+
Phyciodes tharos	Myrtle Head Savanna, -	91-10-10	D	+
Phyciodes tharos	Myrtle Head Savanna, -	92-05-04	D	+
Phyciodes tharos	Myrtle Head Savanna, -	92-06-25	D	+
Phyciodes tharos	Myrtle Head Savanna, -	92-09-03	D	+
Vanessa virginiensis	Myrtle Head Savanna, -	91-06-11	D	+
Vanessa virginiensis	Myrtle Head Savanna, -	91-10-10	D	+
Vanessa virginiensis	Myrtle Head Savanna, Site 1	91-06-10	D	+
Vanessa cardui	Myrtle Head Savanna, -	91-10-10	D	+
Junonia coenia	Angola Creek Flatwoods, -	91-06-12	D	+
Junonia coenia	Angola Creek Flatwoods, -	91-08-07	D	+
Junonia coenia	Angola Creek Flatwoods, -	91-10-11	D	+
Junonia coenia	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Junonia coenia	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+
Junonia coenia	Green Swamp Preserve, Deer Island Savanna	91-06-11	D	+
Junonia coenia	Green Swamp Preserve, Little Island Savanna	91-06-10	D	+
Junonia coenia	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Junonia coenia	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Junonia coenia	Lanier Quarry Savanna, Big Savanna	91-07-12	D	+
Junonia coenia	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Junonia coenia	Lanier Quarry Savanna, Big Savanna	91-10-11	D	+
Junonia coenia	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Junonia coenia	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Junonia coenia	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Junonia coenia	Myrtle Head Savanna, -	91-06-11	D	+
Junonia coenia	Myrtle Head Savanna, -	91-07-11	D	+
Junonia coenia	Myrtle Head Savanna, -	91-10-10	D	+
Junonia coenia	Myrtle Head Savanna, -	92-06-25	D	+
Junonia coenia	Myrtle Head Savanna, -	92-09-03	D	+
Limenitis arthemis astyanax	Angola Creek Flatwoods, -	91-06-12	D	+
Limenitis arthemis astyanax	Lanier Quarry Savanna, -	91-06-12	D	+
Limenitis archippus	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Limenitis archippus	Lanier Quarry Savanna, Big Savanna	91-07-12	D	+
Limenitis archippus	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Limenitis archippus	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Hermeuptychia hermes sosybius	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Hermeuptychia hermes sosybius	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Hermeuptychia hermes sosybius	Myrtle Head Savanna, -	91-10-10	D	+
Neonympha areolatus	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Neonympha areolatus	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Neonympha areolatus	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Neonympha areolatus	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Neonympha areolatus	Green Swamp Preserve, Big Island Savanna	92-06-24	D	+
Neonympha areolatus	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+

Neonympha areolatus	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Neonympha areolatus	Green Swamp Preserve, Little Island Savanna	92-06-24	D	+
Neonympha areolatus	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Neonympha areolatus	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Neonympha areolatus	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Neonympha areolatus	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Neonympha areolatus	Myrtle Head Savanna, -	91-06-11	D	+
Neonympha areolatus	Myrtle Head Savanna, -	91-09-10	D	+
Neonympha areolatus	Myrtle Head Savanna, -	92-06-24	D	+
Neonympha areolatus	Myrtle Head Savanna, -	92-09-03	D	+
Neonympha areolatus	Myrtle Head Savanna, Site 1	91-06-10	D	+
Neonympha areolatus	Myrtle Head Savanna, Site 2	91-08-06	D	+
Cercyonis pegala	Angola Creek Flatwoods, -	91-08-07	D	+
Cercyonis pegala	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Cercyonis pegala	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Cercyonis pegala	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Cercyonis pegala	Green Swamp Preserve, Shoestring Savanna	91-07-10	D	+
Cercyonis pegala	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Cercyonis pegala	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Cercyonis pegala	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Cercyonis pegala	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Cercyonis pegala	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Cercyonis pegala	Myrtle Head Savanna, -	91-07-11	D	+
Cercyonis pegala	Myrtle Head Savanna, -	91-09-10	D	+
Cercyonis pegala	Myrtle Head Savanna, -	92-09-03	D	+
Danaus plexippus	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Danaus plexippus	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Danaus plexippus	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Danaus plexippus	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Danaus plexippus	Myrtle Head Savanna, -	92-05-04	D	+
Epargyreus clarus	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Epargyreus clarus	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Epargyreus clarus	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Epargyreus clarus	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Epargyreus clarus	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Epargyreus clarus	Myrtle Head Savanna, -	91-09-10	D	+
Epargyreus clarus	Myrtle Head Savanna, -	91-10-10	D	+
Urbanus proteus	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Urbanus proteus	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+
Urbanus proteus	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Urbanus proteus	Lanier Quarry Savanna, Big Savanna	91-10-11	D	+
Urbanus proteus	Myrtle Head Savanna, -	91-09-10	D	+
Urbanus proteus	Myrtle Head Savanna, -	91-10-10	D	+
Thorybes bathyllus	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Thorybes bathyllus	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Thorybes bathyllus	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Thorybes bathyllus	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Thorybes confusis	Green Swamp Preserve, Shoestring Savanna	91-04-13	D	+
Thorybes sp.	Angola Creek Flatwoods, -	91-07-12	D	+
Thorybes sp.	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Thorybes sp.	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Erynnis zarucco	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Erynnis zarucco	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Erynnis baptisiae	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Pyrgus communis	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Pyrgus communis	Lanier Quarry Savanna, Big Savanna	91-10-11	D	+
Pyrgus communis	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Pyrgus communis	Myrtle Head Savanna, -	91-09-10	D	+
Pyrgus communis	Myrtle Head Savanna, -	91-10-10	D	+
Nastra lherminier	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Nastra lherminier	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Nastra lherminier	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+

Nastra lherminier	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Nastra lherminier	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Nastra lherminier	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Nastra lherminier	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Nastra lherminier	Myrtle Head Savanna, -	91-06-11	D	+
Nastra lherminier	Myrtle Head Savanna, -	91-09-10	D	+
Nastra lherminier	Myrtle Head Savanna, -	91-10-10	D	+
Nastra lherminier	Myrtle Head Savanna, -	92-09-03	D	+
Lerema accius	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+
Lerema accius	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Lerema accius	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Lerema accius	Lanier Quarry Savanna, Front Savanna	91-10-11	D	+
Lerema accius	Myrtle Head Savanna, -	91-10-10	D	+
Copaeodes minima	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Copaeodes minima	Lanier Quarry Savanna, Big Savanna	91-07-12	D	+
Copaeodes minima	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Copaeodes minima	Myrtle Head Savanna, -	91-07-11	D	+
Hylephila phyleus	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Hylephila phyleus	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Hylephila phyleus	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Polites themistocles	Green Swamp Preserve, Little Island Savanna	92-09-03	D	+
Polites themistocles	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Polites themistocles	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Polites origenes	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Polites vibex	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Polites vibex	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Polites vibex	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Polites vibex	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Polites vibex	Myrtle Head Savanna, -	91-09-10	D	+
Polites vibex	Myrtle Head Savanna, -	91-10-10	D	+
Polites sp.	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+
Wallengrenia otho	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+
Wallengrenia egeremet	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Atalopedes campestris	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Atalopedes campestris	Myrtle Head Savanna, -	91-09-10	D	+
Atrytone logan	Green Swamp Preserve, Big Island Savanna	92-09-03	D	+
Atrytone logan	Lanier Quarry Savanna, Big Savanna	91-05-10	D	+
Atrytone logan	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Atrytone logan	Lanier Quarry Savanna, Big Savanna	91-08-07	D	+
Atrytone logan	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Atrytone logan	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Atrytone logan	Myrtle Head Savanna, -	91-06-11	D	+
Atrytone logan	Myrtle Head Savanna, -	92-09-03	D	+
Poanes yehl	Angola Creek Flatwoods, -	91-05-10	D	+
Poanes yehl	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Poanes yehl	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Euphyes dion	Lanier Quarry Savanna, Big Savanna	91-06-12	D	+
Euphyes dion	Myrtle Head Savanna, -	92-09-03	D	+
Euphyes ruricola metacomet	Myrtle Head Savanna, -	91-09-10	D	+
Amblyscirtes carolina	Green Swamp Preserve, Shoestring Savanna	91-04-13	D	+
Amblyscirtes alternata	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Lerodea eufala	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Lerodea eufala	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Lerodea eufala	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Lerodea eufala	Lanier Quarry Savanna, Front Savanna	91-09-11	D	+
Lerodea eufala	Myrtle Head Savanna, -	91-06-11	D	+
Oligoria maculata	Lanier Quarry Savanna, Big Savanna	92-09-02	D	+
Oligoria maculata	Myrtle Head Savanna, -	91-06-11	D	+
Oligoria maculata	Myrtle Head Savanna, -	91-09-10	D	+
Oligoria maculata	Myrtle Head Savanna, -	92-06-25	D	+
Panoquina ocola	Lanier Quarry Savanna, Big Savanna	91-09-11	D	+
Panoquina ocola	Myrtle Head Savanna, -	91-10-10	D	+

Mermiria picta	Angola Creek Flatwoods, -	91-08-07	D	+
Mermiria picta	Angola Creek Flatwoods, -	91-10-11	D	+
Mermiria picta	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Mermiria picta	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Mermiria picta	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Mermiria picta	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Mermiria picta	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Mermiria picta	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+
Mermiria picta	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Mermiria picta	Lanier Quarry Preserve, Big Savanna	91-09-11	D	+
Syrbula admirabilis	Angola Creek Flatwoods, -	91-08-07	D	+
Syrbula admirabilis	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Syrbula admirabilis	Green Swamp Preserve, Shoestring Savanna	91-07-10	D	+
Syrbula admirabilis	Green Swamp Preserve, Big Island Savanna	91-08-05	D	+
Syrbula admirabilis	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Syrbula admirabilis	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Syrbula admirabilis	Lanier Quarry Preserve, Big Savanna	91-09-11	D	+
Syrbula admirabilis	Myrtle Head Savanna, -	91-09-10	D	+
Amblytropidia mysteca	Lanier Quarry Preserve, -	92-05	D	+
Amblytropidia mysteca	Myrtle Head Savanna, -	92-05-05	D	+
Amblytropidia mysteca	Myrtle Head Savanna, -	92-06-25	D	+
Orphulella pelidna	Angola Creek Flatwoods, -	91-07-12	D	+
Orphulella pelidna	Angola Creek Flatwoods, -	91-08-07	D	+
Orphulella pelidna	Angola Creek Flatwoods, -	91-09-11	D	+
Orphulella pelidna	Angola Creek Flatwoods, -	91-10-11	D	+
Orphulella pelidna	Green Swamp Preserve, Shoestring Savanna	91-06-11	D	+
Orphulella pelidna	Green Swamp Preserve, Shoestring Savanna	91-07-10	D	+
Orphulella pelidna	Green Swamp Preserve, Big Island Savanna	91-08-05	D	+
Orphulella pelidna	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Orphulella pelidna	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Orphulella pelidna	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Orphulella pelidna	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Orphulella pelidna	Lanier Quarry Preserve, Big Savanna	91-06-12	D	+
Orphulella pelidna	Lanier Quarry Preserve, Big Savanna	91-07-12	D	+
Orphulella pelidna	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Orphulella pelidna	Lanier Quarry Preserve, Big Savanna	91-09-11	D	+
Orphulella pelidna	Myrtle Head Savanna, -	91-06-11	D	+
Orphulella pelidna	Myrtle Head Savanna, -	91-07-11	D	+
Orphulella pelidna	Myrtle Head Savanna, -	92-06-25	D	+
Dichromorpha viridis	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Dichromorpha viridis	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Dichromorpha viridis	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Dichromorpha viridis	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Dichromorpha viridis	Lanier Quarry Preserve, Big Savanna	91-07-12	D	+
Dichromorpha viridis	Lanier Quarry Preserve, Big Savanna	91-08-06	D	+
Dichromorpha viridis	Lanier Quarry Preserve, Big Savanna	91-09-11	D	+
Dichromorpha viridis	Lanier Quarry Preserve, Front Savanna	91-10-11	D	+
Dichromorpha viridis	Myrtle Head Savanna, -	91-09-10	D	+
Dichromorpha viridis	Myrtle Head Savanna, -	92-06-25	D	+
Dichromorpha elegans	Green Swamp Preserve, Big Island Preserve	91-08-06	D	+
Dichromorpha elegans	Green Swamp Preserve, Big Island Savanna	91-08-06	D	+
Dichromorpha elegans	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Dichromorpha elegans	Lanier Quarry Preserve, Front Savanna	91-10-11	D	+
Stethophyma celata	Myrtle Head Savanna, -	91-06-11	D	+
Stethophyma celata	Myrtle Head Savanna, -	91-07-11	D	+
Stethophyma celata	Myrtle Head Savanna, -	92-06-25	D	+
Arphia granulata	Angola Creek Flatwoods, -	91-06-12	D	+
Arphia granulata	Angola Creek Flatwoods, -	91-07-12	D	+

Arphia granulata	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Arphia granulata	Green Swamp Preserve, Shoestring Savanna	91-07-10	D	+
Arphia granulata	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Arphia granulata	Green Swamp Preserve, Little Island Savanna	92-06-24	D	+
Arphia xanthoptera	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Arphia xanthoptera	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+
Arphia xanthoptera	Lanier Quarry Preserve, Front Savanna	91-10-11	D	+
Arphia xanthoptera	Myrtle Head Savanna, -	91-10-10	D	+
Arphia sp.	Angola Creek Flatwoods, -	91-10-11	D	+
Arphia sp.	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Chortophaga viridifasciata	Angola Creek Flatwoods, -	91-10-11	D	+
Chortophaga viridifasciata	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Chortophaga viridifasciata	Lanier Quarry Preserve, Big Savanna	91-04-14	D	+
Chortophaga viridifasciata	Myrtle Head Savanna, -	91-06-11	D	+
Chortophaga viridifasciata	Myrtle Head Savanna, -	91-09-10	D	+
Chortophaga viridifasciata	Myrtle Head Savanna, -	91-10-10	D	+
Chortophaga viridifasciata	Myrtle Head Savanna, -	92-05-04	D	+
Chortophaga viridifasciata	Myrtle Head Savanna, -	92-06-25	D	+
Pardalophora phoenicoptera	Angola Creek Flatwoods, -	91-07-12	D	+
Pardalophora phoenicoptera	Angola Creek Flatwoods, -	91-08-07	D	+
Dissosteira carolina	Lanier Quarry Preserve, -	91-07-12	D	+
Dissosteira carolina	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Dissosteira carolina	Lanier Quarry Preserve, Big Savanna	91-09-11	D	+
Dissosteira carolina	Myrtle Head Savanna, -	91-07-11	D	+
Dissosteira carolina	Myrtle Head Savanna, -	91-09-10	D	+
Spharagemon bolli	Angola Creek Flatwoods, -	91-07-12	D	+
Spharagemon bolli	Angola Creek Flatwoods, -	91-08-07	D	+
Spharagemon cristatum	Green Swamp Preserve, Big Island Savanna	91-07-10	D	+
Spharagemon cristatum	Green Swamp Preserve, Big Island Savanna	91-08-05	D	+
Spharagemon cristatum	Lanier Quarry Preserve, -	91-07-12	D	+
Spharagemon cristatum	Myrtle Head Savanna, -	91-06-11	D	+
Spharagemon cristatum	Myrtle Head Savanna, -	91-07-11	D	+
Psinidia fenestralis	Angola Creek Flatwoods, -	91-07-12	D	+
Psinidia fenestralis	Angola Creek Flatwoods, -	91-08-07	D	+
Psinidia fenestralis	Myrtle Head Savanna, -	91-07-11	D	+
Leptysma marginicollis	Myrtle Head Savanna, -	92-05-04	D	+
Leptysma marginicollis	Myrtle Head Savanna, -	92-06-25	D	+
Melanoplus decorus	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Melanoplus decorus	Lanier Quarry Preserve, Front Savanna	91-09-11	D	+
Melanoplus decorus group	Green Swamp Preserve, Big Island Savanna	91-08-05	D	+
Melanoplus decorus group	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Melanoplus decorus group	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Melanoplus decorus group	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Melanoplus decorus group	Lanier Quarry Preserve, Front Savanna	91-10-11	D	+
Melanoplus nubilis	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Melanoplus nubilus	Myrtle Head Savanna, -	91-09-10	D	+
Melanoplus sanguinipes	Green Swamp Preserve, Shoestring Savanna	91-06-11	D	+
Melanoplus sanguinipes	Lanier Quarry Preserve, Big Savanna	91-06-12	D	+
Melanoplus differentialis	Myrtle Head Savanna, -	91-09-10	D	+
Melanoplus femurrubrum propinquus	Angola Creek Flatwoods, -	91-09-11	D	+
Melanoplus femurrubrum propinquus	Angola Creek Flatwoods, -	91-10-11	D	+
Melanoplus femurrubrum propinquus	Green Swamp Preserve, Shoestring Savanna	91-07-10	D	+
Melanoplus femurrubrum propinquus	Green Swamp Preserve, Big Island Savanna	91-08-05	D	+
Melanoplus femurrubrum propinquus	Green Swamp Preserve, Big Island Savanna	91-09-09	D	+
Melanoplus femurrubrum propinquus	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Melanoplus femurrubrum propinquus	Lanier Quarry Preserve, Big Savanna	91-06-12	D	+
Melanoplus femurrubrum propinquus	Lanier Quarry Preserve, Big Savanna	91-07-12	D	+
Melanoplus femurrubrum propinquus	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Melanoplus femurrubrum propinquus	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Melanoplus femurrubrum propinquus	Lanier Quarry Preserve, Big Savanna	91-09-11	D	+
Melanoplus femurrubrum propinquus	Lanier Quarry Preserve, Front Savanna	91-10-11	D	+
Melanoplus femurrubrum propinquus	Myrtle Head Savanna, -	91-06-11	D	+

Melanoplus sp.	Angola Creek Flatwoods, -	91-08-07	D	+
Melanoplus sp.	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Melanoplus sp.	Lanier Quarry Preserve, Big Savanna	91-08-06	D	+
Paroxya atlantica	Myrtle Head Savanna, -	91-07-11	D	+
Paroxya atlantica	Myrtle Head Savanna, -	92-06-24	D	+
Paroxya sp.	Lanier Quarry Preserve, -	91-09-11	D	+
Schistocerca americana	Angola Creek Flatwoods, -	91-09-11	D	+
Schistocerca americana	Angola Creek Flatwoods, -	91-10-11	D	+
Schistocerca americana	Green Swamp Preserve, Deer Island Savanna	91-09-10	D	+
Schistocerca americana	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Schistocerca americana	Green Swamp Preserve, Big Island Savanna	91-10-09	D	+
Schistocerca americana	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+
Schistocerca americana	Lanier Quarry Preserve, Big Savanna	91-04-14	D	+
Schistocerca americana	Lanier Quarry Preserve, Front Savanna	91-10-11	D	+
Schistocerca americana	Myrtle Head Savanna, -	91-09-10	D	+
Schistocerca americana	Myrtle Head Savanna, -	91-10-10	D	+
Schistocerca alutacea?	Green Swamp Preserve, Big Island Savanna	91-08-05	D	+
Schistocerca alutacea	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Schistocerca alutacea	Lanier Quarry Preserve, Big Savanna	91-08-07	D	+
Schistocerca alutacea	Lanier Quarry Preserve, Big Savanna	91-09-11	D	+
Schistocerca alutacea	Myrtle Head Savanna, -	92-06-25	D	+
Schistocerca rubiginosa	Angola Creek Flatwoods, -	91-08-07	D	+
Schistocerca rubiginosa	Angola Creek Flatwoods, -	91-08-07	D	+
Schistocerca rubiginosa	Angola Creek Flatwoods, -	91-09-11	D	+
Schistocerca rubiginosa	Angola Creek Flatwoods, -	91-10-11	D	+
Schistocerca rubiginosa	Green Swamp Preserve, Shoestring Savanna	91-09-10	D	+
Schistocerca rubiginosa	Green Swamp Preserve, Shoestring Savanna	91-10-10	D	+
Amblyocorypha oblongifolia	Myrtle Head Savanna, Site 2	91-08-05	L	+
Amblyocorypha uhleri	Lanier Quarry Preserve, Big Savanna	91-08-07	L	+
Microcentrum rhombifolium	Lanier Quarry Preserve, -	91-08-06	L	+
Microcentrum rhombifolium	Myrtle Head Savanna, -	91-08-05	L	+
Scudderia curvicauda	Green Swamp Preserve, Big Island Savanna	91-08-05	L	+
Scudderia curvicauda	Lanier Quarry Preserve, -	91-08-06	L	+
Scudderia furcata	Lanier Quarry Preserve, -	92-08-06	L	+
Scudderia texensis	Myrtle Head Savanna, Site 2	91-10-10	D	+
Inscudderia walkeri	Myrtle Head Savanna, Site 2	91-08-05	L	+
Neoconocephalus triops	Green Swamp Preserve, Big Island Savanna	91-08-05	L	+
Pyrgocorypha uncinata	Angola Creek Flatwoods, -	91-10-10	L	+
Conocephalus sp.	Myrtle Head Savanna, Site 1	92-06-23	L	+
Orchelimum erythrocephalum	Myrtle Head Savanna, Site 1	91-09-10	D	+
Orchelimum sp.	Green Swamp Preserve, Big Island Savanna	91-08-05	D	+
Orchelimum sp.	Myrtle Head Savanna, -	91-08-05	D	+
Atlanticus pachymerus	Myrtle Head Savanna, -	92-05-05	O	+
Hubbellia marginifera	Green Swamp Preserve, Shoestring Savanna	91-07-10	B	+
Hubbellia marginifera	Green Swamp Preserve, Shoestring Savanna	91-09-09	B	+

APPENDIX B

DISTRIBUTION, HABITAT, AND DIET[7]

[7] Compiled from literature cited in the References; from personal communications from David Stephan, Dave Baggett, and Tim McCabe; and from personal observations by D.F. Schweitzer

	Species	Distribution	Habitats	Host Plants
		MACRO MOTHS		
I. POORLY UNDERSTOOD DISTRIBUTIONS AND LIFE HISTORIES				
0-?[8]	Renia nr. discoloralis	Unk	Unk	dead leaves
0-G	Idaea demissaria	General	Unk	
0-G	Cyclophora packardi	General		
0-G	Eubaphe meridiana	General		
0-G	Crambidia pura/cephalica complex	General?	General?	lichens
0-G	Comachara cadburyi	General		Nyssa?
0-G	Apantesis carlotta (of Ferguson)	General		forbs, graminoids
0-G	Macrochilo orciferalis	General		
0-G	Renia nemoralis	General		dead leaves
0-G	Nigetia formosalis	General		
0-G	Bomolocha manalis	General		
0-G	Hemeroplanis scopulepes	General		
0-G	Phytometra rhodarialis	General		
0-G	Cissusa spadix	General		
0-G	Lesmone detrahens	General		
0-G	Dysgonia smithii	General		
0-G	Oruza albocostaliata	General		
0-G	Iodopepla u-album	General		
0-G	Elaphria georgei	General but poorly known		
0-N	Zanclognatha theralis	N:		dead leaves
0-S	Glenoides texanaria	S: VA->TX		
0-S	Episemasia solitaria	S: NJ->FL	Unk	Ilex glabra?
0-S	Euchlaena amoenaria astylusaria	S: Va->		
0-S	Tacparia zalissaria	S: NJ->FL (n. to Block Island)	Unk	Myrica?
0-S	Eusarca fundaria	S: swNJ->	Unk	Baccharis
0-S	Nematocampa baggetaria	S/CP: NC->	Unk	
0-S	Nemoria elfa	S: NC->		
0-S	Lophosis labeculata	S: SC->FL	Unk	
0-S	Holomelina rubicundaria	S: FL->Gulf Coast		forbs?
0-S	Hypenula cacuminalis	S: sNJ->FL		

[8] Habitat codes for the categories used in Table II; G = general, N = northern, S = southern

	Species	Distribution	Habitats	Phagy Host Plants
0-S	Ablemma n. sp.	S: swNJ & Deep South		
0-S	Ophiuche minualis	Tropical migrant		
0-S	Cutina albopunctella	S:	Cypress swamps?	
0-S	Cutina n. sp.	S: ?		
0-S	Acherdoa ferraria	S: NC->FL		ferns?
II. GENERAL HABITATS				
1-G	Eumacaria latiferrugata	General	General	Malus, Prunus, Aronia?
1-G	Semiothisa eremiata	General	Open woods and savannas	Tephrosia
1-G	Exelis pyrolaria	General	General	Diospyros (but not Chimaphila, as has been reported)
1-G	Anacamptodes humaria	General	General	hardwoods, Forbs, alfalfa, soybeans
1-G	Anavitrinelia pampinaria	General	General	hardwoods, forbs, clover, cotton
1-G	Protoboarmia porcelaria	General	Forests	hardwoods, conifers, Chamaecyparis
1-G	Melanolophia signataria	General	Forests	Pines, other conifers, hardwoods, Alnus
1-G	Lycia ypsilon	General	General	Malus, Clethra, Carya pallida, Prunus (beach plum)
1-G	Hypagyrtis unipunctata	General	Forests	hardwoods, Conifers
1-G	Thysanopyga intractata	General		Ilex
1-G	Metarranthus homuraria	General	General	Rosaceae?
1-G	Metarranthus obfirmaria	General	General	Vaccinium, other Ericaceae (probably not Prunus or Quercus, as reported)
1-G	Besma quercivoraria	General	Forests	hardwoods, Picea
1-G	Prochoerodes transversata	General	General	hardwoods, Vaccinium, forbs, Poaceae, soybean
1-G	Nematocampa resistaria	General	Forests	conifers, hardwoods, shrubs, Myrica, Vaccinium
1-G	Nemoria bifilata	General	Xeric forests	Quercus marilandica, Q. ilicifolia (Rhus copallina in laboratory)
1-G	Dichorda iridaria	General	General	Rhus
1-G	Synchlora aerata	General	General	Asteraceae, Gaylussacia, Rubus
1-G	Chlorochlamys chloroleucaria	General	General	Asteraceae, Dianthus, Prunus, Rubus, Myrica, Apocynum
1-G	Pleuroprucha insulsaria	General	General	hardwoods, Maize, Asteraceae
1-G	Scopula limboundata	General	General	hardwoods, Vaccinium, forbs
1-G	Eulithis gracilineata	General	General	Vitaceae
1-G	Orthonama obstipata	Cosmopolitan	General	forbs, Ulmus
1-G	Eupithecia miserulata	General	General	hardwoods, Myrica, Juniperus, forbs
1-G	Artace cribraria	General	General	Quercus, Prunus, Rosa
1-G	Malacosoma americanum	General	General	Rosaceae, rarely other hardwoods
1-G	Eacles imperialis	General	Forests	hardwoods, Pinus
1-G	Citheronia regalis	General	General	hardwoods, Rhus, Diospyros, cotton
1-G	Automeris io	General	General	hardwoods, clover, corn
1-G	Antheraea polyphemus	General	Forests	hardwoods, Vitus (but not Pinus, as has been reported)
1-G	Ceratomia catalpae	General	General	Catalpa
1-G	Xylophanes tersa	General	General	Catalpa, Diospyros, Rubiaceae, Zea, Phaseolus
1-G	Datana perspicua	General	General	Rhus

	Species	Distribution	Habitats	Phagy Host Plants
1-G	Heterocampa guttivitata	General	General	hardwoods, Rhus
1-G	Schizura ipomoeae	General	General	hardwoods, Ipomoea, Rosa
1-G	Crambidia lithosioides	General	General	lichens
1-G	Crambidia pallida	General	General	lichens
1-G	Cisthene kentuckiensis	General	General	lichens
1-G	Cisthene plumbea	General	General	lichens
1-G	Cisthene packardii	General	General	lichens
1-G	Hypoprepia miniata	General	General	lichens (arboreal)
1-G	Hypoprepia fucosa	General	General	lichens
1-G	Clemensia albata	General	General	blue-green alga (not lichens)
1-G	Utetheisa bella	General	General	Crotalaria, Fabaceae (but not Ulmus, Prunus, Gale, as has been reported)
1-G	Haploa clymene	General	General	hardwoods, Eupatorium
1-G	Spilosoma congrua	General	General	forbs
1-G	Spilosoma virginica	General	General	hardwoods, forbs, corn, tobacco, cabbage, ferns
1-G	Ecpantheria scribonia	General	General	Acer, Salix, Prunus, forbs
1-G	Cisseps fulvicollis	General	General	Poaceae, Eleocharis, lichens
1-G	Orgyia leucostigma	General	Forests	hardwoods, conifers, shrubs
1-G	Idia americalis	General	General	lichens, dead leaves
1-G	Idia aemula	General	General	dead leaves
1-G	Idia rotundalis	General	General	dead leaves, coral fungus
1-G	Idia forbesi	General	General	dead leaves
1-G	Idia julia	General	General	dead bark
1-G	Idia diminuendis	General	General	dead leaves?
1-G	Idia lubricalis	General	General	fungi, lichens, Poaceae, dead wood
1-G	Zanclognatha lituralis	General	General	dead leaves
1-G	Zanclognatha cruralis	General	General	dead leaves?
1-G	Zanclognatha jacchusalis	General	General	dead leaves?
1-G	Phalaenostola larentioides	General	General	Poa, clover, dead leaves
1-G	Tetanolita mynesalis	General	General	dead leaves?
1-G	Tetanolita floridana	General	General	dead leaves?
1-G	Bleptina caradrinalis	General	General	Berberis, clover, Carya, dead leaves
1-G	Renia discoloralis	General	General	dead leaves
1-G	Renia adspergillus	General	General	Diospyros, dead leaves
1-G	Renia sobrialis	General	General	dead leaves
1-G	Palthis angulalis	General	General	Betulaceae, conifers, Rubus, Lonicera, shrubs
1-G	Palthis asopialis	General	General	Fabaceae, Quercus, corn
1-G	Schrankia macula	S: nVA->FL	Forests	bracket fungus
1-G	Plathypena scabra	General	General	Fabaceae, Fragaria, Rubus
1-G	Metalectra discalis	General	General	fungus (dry)
1-G	Metalectra quadrisignata	General	General	fungus (bracket)
1-G	Metalectra tantillus	General	General	fungus, dead bark

	Species	Distribution	Habitats	Phagy Host Plants
1-G	Metalectra richardsi	General	General	fungus?
1-G	Zale aeruginosa	General	Forests	Quercus virginiana, Q. alba, (but not Picea, as has been reported)
1-G	Celiptera frustulum	General	General	Robinia
1-G	Argyrostrotis quadrifilaris	General	General	Ericaceae?, Rosaceae?, (cotton?)
1-G	Marathyssa inflicta	General	General	Rhus, Toxicodendron
1-G	Thioptera nigrofimbria	General	General	Digitaria, Ipomoeia? (unlikely -- Schweitzer)
1-G	Homophoberia apicosa	General	General	Polygonum
1-G	Acronicta clarescens	General	General	Rosaceae: Malus, Prunus, Sorbus, Amelanchier, Crataegus
1-G	Acronicta longa	General	General	hardwoods, Rosa, Rubus
1-G	Acronicta oblinita	General	General	hardwoods, conifers, shrubs, forbs, Poaceae
1-G	Eudryas unio	General	General	Hibiscus, Vitis, Justicia, Oenothera
1-G	Eudryas grata	General	General	Vitaceae (but not Cephalanthus and Humulus, as has been reported)
1-G	Phlogophora periculosa	N: Lab.->SC	Forests	Alnus, Abies, Prunus, Vaccinium macrocarpon
1-G	Chytonix palliatricula	General	General	smut
1-G	Nedra ramosula	General	General	Hypericum
1-G	Callopistria mollissima	General	General?	ferns
1-G	Callopistria cordata	General	General	ferns
1-G	Anorthodes tarda	General	General	dead leaves
1-G	Elaphria chalcedonia	General		Scrophulariaceae
1-G	Elaphria grata	General	General	Quercus, Viola, clover, dead leaves
1-G	Galgula partita	General	General	Oxalis
1-G	Pseudaletia unipuncta	Cosmopolitan	General	shrubs, forbs, Poaceae
1-G	Egira alternans	General	Forests	Quercus (but not Lonicera, as has been reported)
1-G	Morrisonia confusa	General	Forests	hardwoods, Vaccinium, Pinus?
1-G	Orthodes crenulata	General	General	Poaceae, Taraxacum, Salix, forbs
1-G	Euagrotis illapsa	General	General?	Carex, graminiods, forbs?
1-G	Peridroma saucia	Cosmopolitan	General	hardwoods, Alnus, wheat, clover, corn, tobacco
1-N	Glena cribrataria	N: sOnt.->sVA	Forests	Populus, Salix, Picea (diet not completely understood)
1-N	Nemoria mimosaria	N: Can.->wNC (few s. records)	Forests	conifers, hardwoods, Comptonia peregrina
1-N	Chytolita morbidalis	N: ME->NC	General	dead leaves, forbs
1-N	Xestia dolosa	N: N.S.->wNC	General	hardwoods, forbs, corn, clover, tobacco
1-S	Itame varadaria	S/CP: SC->FL	Open areas and woodlands	Baccharis
1-S	Melanolophia canadaria	S: NJ->TX	Forests	hardwoods, conifers
1-S	Erastria cruentaria	S: MD->TX	General	Rubus?
1-S	Euchlaena obtusaria (of Field Guide)	S: NJ->FL	General	Rosa, Vaccinium, Myrica, Impatiens (rarely?)
1-S	Agrius cingulata	S/Migrant	General	Ipomoea batatus, Datura, Asimina?
1-S	Crambidia nr. pallida	S/CP: NJ->FL	General?	lichens
1-S	Crambidia uniformis	CP: NJ-SC	General	lichens
1-S	Cisthene subjecta	S: NC->	General	lichens
1-S	Renia fraternalis	S: NC->	General	dead leaves
1-S	Dipthera festiva	S: SC->TX	General	Carya illinoiensis, hardwoods, sweet potato (diet not well understood)

	Species	Distribution	Habitats	Phagy Host Plants
1-S	Eumicremma minima	S: NC->	Dry open areas	Anaphalis, Gnaphalium, Pterocaulon
1-S	Tarachidia semiflava	S: NJ->FL	General	Heterotheca mariana (not Sarracenia, as has been reported)
1-S	Acronicta brumosa	S: NJ->	General	Quercus (but not Hamamelis, Corylus, or Rubus, as has been reported)
1-S	Spodoptera dolichos	S/Tropical migrant	General	Carya, forbs, clover, corn, tobacco, cotton
III. CROPLANDS AND GENERAL OPEN AREAS				
2-G	Manduca sexta	General	Croplands and open areas	Solanaceae
2-G	Manduca quinquemaculata	General	Croplands and open areas	Solanaceae
2-G	Anticarsia gemmatilis	General	Croplands and open areas	Fabaceae, alfalfa, soybean, peanut, Robinia
2-G	Mocis latipes	General	Croplands and open areas	Poaceae, corn, rice, beans, turnip
2-G	Trichoplusia ni	General	Croplands and open areas	Brassicaceae, forbs
2-G	Cteniplusia (= Agrapha) oxygramma	General	Croplands and open areas	Asteraceae, Solanaceae, forbs
2-G	Spodoptera exigua	General	Croplands and open areas	Malus, corn, beans, vegetables
2-G	Spodoptera frugiperda	General	Croplands and open areas	forbs, corn, alfalfa, cotton, tobacco, Poaceae
2-G	Spodoptera ornithogalli	General	Croplands and open areas	forbs, cotton, clover, tobacco, potato, Poaceae
2-G	Platysenta sutor	General	Croplands and open areas	celery, marigold
2-G	Ogdoconta cinereola	General	Croplands and open areas	forbs, Asteraceae, Fabaceae, artichokes
2-G	Agrotis malefida	General	Croplands and open areas	forbs, clover, corn, tomato, peas
2-G	Agrotis ipsilon	Cosmopolitan	Croplands and open areas	forbs, clover, corn, lettuce, potato, tobacco
2-G	Agrotis subterranea	General	Croplands and open areas	forbs, Poaceae, corn, clover, beans, tobacco
2-G	Anicla infecta	General	Croplands and open areas	forbs, Poaceae, clover, tobacco, beets
2-G	Heliothis zea	Cosmopolitan	Croplands and open areas	forbs, corn, cotton, tomato, tobacco
2-G	Heliothis virescens	General	Croplands and open areas	Solanaceae, tobacco, Rosa, Ageratum
2-S	Synchlora frondaria	S/CP: MD->	Croplands and open areas	Stillingia, Asteraceae, Rubus, Leguminosae, soybean
2-S	Nola sorghiella	S/Tropical	Croplands and open areas	Poaceae, Sorghum
2-S	Spodoptera eridania	S/migrant	Croplands and open areas	forbs, Amaranthus, Phytolacca, corn, potato, tobacco
2-S	Leucania latiuscula (of Forbes)	S: NY->	Croplands and open areas	Poaceae, Digitaria, Hordeum, Sorghum, Zea, Avena

	Species	Distribution	Habitats	Phagy Host Plants
IV. NON-AGRICULTURAL OPEN AREAS				
3-G	Tornos scolopacinarius	General	Open areas	Aster, Coreopsis
3-G	Eusarca confusaria	General	Open areas	Asteraceae
3-G	Scopula inductata	General	Open areas	Asteraceae, clover, Prunus
3-G	Orthonama centrostrigaria	General	Open areas	forbs
3-G	Manduca rustica	General	Open areas	Bignonia, Boraginaceae, Verbenaceae?, Chionanthus?
3-G	Dasylophia anguina	General	Open areas	Fabaceae
3-G	Holomelina laeta	General	Open areas	forbs (Taraxacum, Plantago in laboratory)
3-G	Holomelina opella	General	Open areas	forbs
3-G	Holomelina aurantiaca	General	Open areas	forbs
3-G	Apantesis phalerata	General	Open areas	forbs
3-G	Apantesis nais	General	Open areas	forbs, Poaceae
3-G	Grammia figurata	General	Open areas	forbs
3-G	Grammia phyllira	General	Sandy open areas	forbs, corn, tobacco
3-G	Grammia virgo	General	Open areas	forbs
3-G	Lascoria ambigualis	General	Open areas	Asteraceae (food plants poorly known -- Schweitzer)
3-G	Caenurgia chloropha	General	Open areas	Fabaceae, vetch
3-G	Argyrogramma verruca	General	Open areas	forbs
3-G	Pseudoplusia includens	General	Open areas	forbs
3-G	Megalographa (= Autographa) biloba	General	Open areas	forbs
3-G	Tarachidia candefacta	General	Open areas	Ambrosia
3-G	Elaphria nucicolora	S: NJ (strays)->	Open areas	forbs, Poaceae
3-G	Platysenta videns	General	Open areas	Asteraceae
3-G	Condica confederata	General	Open areas	Bidens
3-G	Tricholita signata	General	Open areas	forbs, Aronia
3-G	Feltia geniculata	General	Open areas	forbs, graminoids
3-G	Heliothis subflexus	General	Open areas	Solanaceae, other forbs?
3-G	Schinia arcigera	General	Open areas	Aster
3-G	Schinia rivulosa	General	Open areas	Ambrosia
3-G	Schinia trifascia	General	Open areas	Eupatorium
3-G	Schinia nundina	General	Open areas	Solidago, Aster
3-S	Idaea tacturata	S: SC->	Open areas?	clover, forbs?
3-S	Disclisioprocta stellata	Tropical migrant	Open areas	Amaranthus, Proboscidea
3-S	Pagara simplex	S: MD->FL	Open areas?	Taraxcum, Lactuca, and probably many other species
3-S	Apantesis vittata	S: MD->FL	Open areas	forbs
3-S	Amyna octo	Tropical migrant	Open areas	Chenopodium
3-S	Platysenta mobilis	S: NJ->FL	Open areas	Bidens
3-S	Schinia nr. bina	S: NC->		Unknown but probably restricted
3-S	Schinia nubila	S:		Unknown but probably restricted

	Species	Distribution	Habitats	Phagy Host Plants
V. OPEN GRASSY AREAS (GENERAL)				
4-G	Redectis vitrea	General	Open grassy areas	Poaceae, crab grass
4-G	Mocis texana	General	Open grassy areas	Poaceae
4-G	Lithacodia muscosula	General	Open grassy areas	Poaceae
4-G	Leucania scirpicola	General	Grasslands	Poaceae
4-N	Leucania linda	N: NY->NC		Poaceae, Andropogon scoparius, Panicum virgatum
4-N	Leucania inermis	N: N.S.->VA	Open grassy areas	Poaceae, Dactylis
4-S	Arugisa latiorella	S: VA->FL	Open grassy areas	Poaceae, Poa pratense
4-S	Mocis marcida	S/CP: SC->FL	Grassy areas (general)	Poaceae?
4-S	Leucania adjuta	S:	Open grassy areas	Poaceae, Dactylis
VI. HARDWOOD FORESTS (GENERAL)				
5-G	Oreta rosea	General	Hardwood forests	Betula, Viburnum
5-G	Itame pustularia	General	Hardwood forests	Acer (and rarely other species)
5-G	Semiothisa aemulataria	General	Hardwood forests	Quercus, Acer, Robinia?
5-G	Ectropis crepuscularia	General	Hardwood forests	hardwoods
5-G	Epimecis hortaria	General	Hardwood forests	Sassafras, Lindera, Liriodendron, Asimina?
5-G	Lomographa vestaliata	General	Hardwood forests	Prunus, other Rosaceae
5-G	Metarranthus angularia complex	General	Hardwood forests	Prunus (cherries -- in laboratory)
5-G	Probole alienaria	General	Hardwood forests	hardwoods, shrubs (diet poorly known)
5-G	Eutralepa clemataria	General	Hardwood forests	hardwoods
5-G	Hethemia pistasciaria	General	Forests	Quercus, Betulaceae, Tilia, Vaccinium
5-G	Idaea violacearia	G: Great Lakes shore; NJ; FL	Dunes and dry, sandy woods?	
5-G	Eulithis diversilineata	General	Hardwood forests	Vitus, Parthenocissus
5-G	Lacosoma chiridota	General	Hardwood forests	Quercus
5-G	Apatelodes torrefacta	General	Hardwood forests	Rosaceae
5-G	Dryocampa rubicunda	General	Hardwood forests	Acer, Quercus (extremely rarely -- Schweitzer)
5-G	Anisota stigma	General	Hardwood forests	Quercus (but not Corylus, as has been reported)
5-G	Anisota senatoria	General	Hardwood forests	Quercus (but not Betula or Rubus, as has been reported)
5-G	Actias luna	General	Hardwood forests	hardwoods
5-G	Callosamia angulifera	General	Hardwood forests	Liriodendron
5-G	Hyalophora cecropia	General	Hardwood forests	hardwoods, shrubs
5-G	Dolba hyloeus	General	Lowland forests	Asimina, Ilex, Comptonia, Vaccinium?
5-G	Paonias excaecatus	General	Hardwood forests	hardwoods (probably only Rosaceae in NC -- Schweitzer)
5-G	Paonias myops	General	Hardwood forests	hardwoods (probably only Rosaceae in NC -- Schweitzer)
5-G	Darapsa myron	General	Hardwood forests	Parthenocissus, Ampelopsis (but not Viburnum)
5-G	Darapsa pholus	General	Hardwood forests	Viburnum, shrubs
5-G	Datana ministra	General	Hardwood forests	Malus, hardwoods
5-G	Datana angusii	General	Hardwood forests	Juglandaceae, Betulaceae, Tiliaceae (poorly documented -- Schweitzer)

	Species	Distribution	Habitats	Phagy Host Plants
5-G	Datana drexelii	General	Hardwood forests	Vaccinium, Hamamelis (but not Tilia, Sassafras, or Betula, as reported)
5-G	Datana contracta	General	Hardwood forests	Quercus (but not Vaccinium or Hamamelis, as has been reported)
5-G	Nadata gibbosa	General	Hardwood forests	hardwoods (primarily Quercus -- Schweitzer)
5-G	Hyperaeschra georgica	General	Hardwood forests	Quercus
5-G	Peridea angulosa	General	Hardwood forests	Quercus
5-G	Furcula cinerea	General	Hardwoods and wetlands	Salicaceae, Betulaceae?
5-G	Symmerista albifrons	General	Hardwood forests	Quercus
5-G	Heterocampa varia	CP: NY->GA	Hardwood forests	
5-G	Heterocampa obliqua	General	Hardwood forests	Quercus
5-G	Heterocampa umbrata	General	Hardwood forests	Quercus
5-G	Heterocampa biundata	General	Hardwood forests	hardwoods
5-G	Lochmaeus manteo	General	Hardwood forests	hardwoods
5-G	Schizura unicornis	General	Hardwood forests	hardwoods, shrubs
5-G	Schizura concinna	General	Hardwood forests	hardwoods, shrubs, Vaccinium, Diospyros
5-G	Hyparpax aurora	General	Hardwoods forests	Quercus (scrub oaks) (not Viburnum, as has been reported)
5-G	Hyphantria cunea	General	Hardwood forests	hardwoods
5-G	Halysidota tessellaris	General	Hardwood forests	hardwoods, shrubs
5-G	Orgyia definita	General	Hardwood forests	hardwoods, shrubs, Hamamelis
5-G	Chytolita petrealis	General	Swamps	Larix, dead leaves
5-G	Bomolocha baltimoralis	General	Hardwood forests	Acer
5-G	Bomolocha bijugalis	General	Hardwood forests	Cornus, C. alternifolia
5-G	Pangrapta decoralis	General		Vaccinium
5-G	Scolecocampa liburna	General	Hardwood forests	dead hardwood (logs and stumps)
5-G	Phyprosopus callitrichoides	General	Hardwood forests	Smilax
5-G	Hypsoropha monilis	S: NC->FL	Open woodlands	Diospyros
5-G	Hypsoropha hormos	General	Open woodlands	Diospyros, Sassafras
5-G	Plusiodonta compressipalpis	General	Lowland forests	Menispermum canadensis
5-G	Panopoda rufimargo	General	Hardwood forests	Fagaceae (primarily oaks, but also beech)
5-G	Panopoda carneicosta	General	Hardwood forests	hardwoods
5-G	Synedoida grandirena	General	Hardwood forests	Hamamelis
5-G	Zale lunata	General	Hardwood forests	hardwoods, shrubs
5-G	Zale minerea	General	Hardwood forests	hardwoods
5-G	Zale horrida	General	Hardwood forests	Viburnum
5-G	Allotria elonympha	General	Hardwood forests	Nyssa spp. (but not on Juglandaecea or Oxydendron, as has been reported)
5-G	Parallelia bistriaris	General	Hardwood forests	Acer (but not Juglans or Betula, as has been reported)
5-G	Cutina distincta	General	Hardwood forests	Hardwoods? (Cypress?)
5-G	Catocala similis	General	Hardwood forests	Quercus
5-G	Catocala micronympha	General	Hardwood forests	Quercus
5-G	Catocala connubialis	General	Hardwood forests	Quercus, Q. rubra
5-G	Paectes pygmaea	General	Hardwood forests	Unknown (Liquidambar based on painting by Abbott -- not confirmed)
5-G	Paectes abrostoloides	General	Hardwood forests	Liquidambar?

	Species	Distribution	Habitats	Phagy Host Plants
5-G	Baileya ophthalmica	General	Hardwood forests	Carpinus
5-G	Nycteola frigidana	General	Hardwoods and wetlands	Populus, Salix
5-G	Meganola phylla	General	Hardwoods and wetlands	Quercus, Salix (unlikely -- Schweitzer)
5-G	Hyperstrotia pervertens	General	Hardwood forests	Quecus macrocarpa (Ulmus americana probably refers to another species)
5-G	Charadra deridens	General	Hardwood forests	hardwoods
5-G	Acronicta americana	General	Hardwood forests	hardwoods (mainly Acer -- Schweitzer)
5-G	Acronicta laetifica	General	Hardwood forests	Carya
5-G	Acronicta hasta	General	Hardwood forests	Prunus (cherry)
5-G	Acronicta lobeliae	General	Hardwood forests	Quercus (but not Prunus serotina, as has been reported)
5-G	Acronicta exilis	General	Hardwood forests	Quercus? (other hardwoods?)
5-G	Acronicta retardata	General	Hardwood forests	Acer
5-G	Acronicta afflicta	General	Hardwood forests	Quercus, Juglans?
5-G	Acronicta impleta	General	Hardwood forests	hardwoods and shrubs
5-G	Agriopodes fallax	General	Hardwood forests	Viburnum
5-G	Polygrammate hebraeicum	General	Hardwood forests	Nyssa
5-G	Harrisimemna trisignata	General	Hardwood forests	hardwoods, shrubs
5-G	Phosphila turbulenta	General	Hardwood forests	Smilax
5-G	Phosphila miselioides	Hardwood forests	General	Smilax
5-G	Amphipyra pyramidoides	General	Hardwood forests	hardwoods, shrubs
5-G	Balsa malana	General	Hardwood forests	certain Rosaceae
5-G	Elaphria festivoides complex	General		unknown
5-G	Morrisonia mucens	General	Xeric hardwoods	Quercus marilandica, Q. ilicifolia
5-G	Ulologhe culea	General	Hardwood forests	Quercus, Q. rubra (perhaps other species than oaks -- Schweitzer)
5-G	Ulolonche modesta	General	Hardwood forests	Quercus
5-N	Pseudothyatira cymatophoroides	N: Nfld.->SC	General	hardwoods, shrubs, Rubus (perhaps primarily)
5-N	Hydria prunivorata	N: N.S.->SC	Forests	Prunus serotina
5-N	Acronicta "haesitata"	N: ME->SC	Hardwood forests	Quercus
5-N	Orthosia revicta	N: NJ->	Hardwood forests	hardwoods
5-S	Anacamptodes defectaria	S: NJ->FL	Hardwood forests	hardwoods
5-S	Euchlaena pectinaria	S: NJ->FL	Hardwood forests	Prunus (cherry), Quercus (eaten readily in captivity -- Schweitzer)
5-S	Cymatophora approximaria	S: seVA->FL	Hardwoods	Quercus (virginiana only?) (not on Smilax, as apparently based on Abbott)
5-S	Nemoria lixaria	S/CP: NJ->	Hardwood forests	Quercus, Acer (used in winter in NJ -- Schweitzer)
5-S	Nemoria saturiba	S: NC-> (swNJ; Durham)	Forests	Liquidambar?
5-S	Haploa colona	CP: seVA->	Hardwood forests	hardwoods
5-S	Dasychira tephra	S: sMD->	Hardwood forests	Quercus
5-S	Dasychira meridionalis	S/CP: NC->	Hardwood forests	Quercus
5-S	Dasychira atrivenosa	S/CP: eMD->	Hardwood forests	Liquidambar?
5-S	Dasychira leucophaea	CP: NJ->	Hardwood forests	Quercus, Q. virginiana
5-S	Pseudanthracia coracias	S:	Hardwood forests	Quercus

	Species	Distribution	Habitats	Phagy Host Plants
6-G	Cleora projecta	General	Barrens, pocosins, and bogs	Gale palustris, Myricaceae
6-G	Catocala muliercula	CP: CN->	Pocosins and coastal scrub	Myrica cerifera
6-G	Nola clethrae	General (MA->)	Wetlands	Clethra
6-G	Papaipema stenoscelis	General	Wetlands	Woodwardia virginica
6-G	Papaipema speciosissima	General	Wetlands	Osmunda
6-N	Lomanaltes eductalis	N: Nova Scotia->AL	Acid bogs	Alnus, Tilia
6-N	Acronicta lanceolaria	N: New England->FL	Barrens and pocosins	hardwoods, Vaccinium, Comptonia peregrina, shrubs
6-N	Anomogyna youngii	N: Lab.->NJ	Bogs and pitch pine lowlands	Vaccinium, Gale, Chamaedaphne, Larix
6-S	Argyrostrotis flavistriaria	S: NC->	Savannas and flatwoods	
6-S	Argyrostrotis sylvarum	S: NC->	Flatwoods and pocosins?	Lyonia?
6-S	Callopistria granitosa	S/CP: NJ->FL	Pocosins and wet savannas?	ferns, Woodwardia areolata?
6-S	Morrisonia n. sp.	S/CP: NC->	Pocosins?	
VIII.	**PINE WOODS AND OTHER CONIFER FORESTS**			
7-G	Semiothisa transitaria	N: N.S.->SC	Pine forests	Pinus
7-G	Semiothisa bicolorata	General	Pine forests	Pinus
7-G	Semiothisa multilineata	General	Conifer forests	Juniperus, Chamaecyparis?
7-G	Anacamptodes vellivolata	General	Conifer forests	conifers
7-G	Hypagyrtis esther	General	Pine forests	Pinus
7-G	Lambdina pellucidaria	General	Pine woods	Pinus rigida, other Pinus (but not Quercus, as has been reported)
7-G	Patalene olyzonaria puber	General	Open woodlands	Juniperus, Pinus?
7-G	Citheronia sepulchralis	General	Pine forests	Pinus
7-G	Lapara coniferarum	General	Pine forests	Pinus, P. palustris, P. taeda, P. rigida
7-G	Zale obliqua (of Forbes)	General	Pine forests	Pinus
7-G	Panthea "furcilla"	General	Pine forests	Pinus
7-G	Elaphria versicolor	General	Conifer forests	conifers
7-S	Semiothisa distribuaria	S/CP: NC->FL	Pine forests	Pinus
7-S	Tolype notialis	S: nVA->	Pine forests	conifers (probably Pinus only -- Schweitzer)
7-S	Tolype minta	S/CP: SC->	Pine forests	Pinus
7-S	Dasychira manto	S: MD->	Pine forests	Pinus
7-S	Zale nr. obliqua	S:	Pine forests	Pinus
7-S	Zale buccholzi	S: NJ->	Pine forests	Pinus
7-S	Anomogyna elimata	General	Pine forests	Pinus

	Species	Distribution	Habitats	Phagy Host Plants
IX. BARRENS AND FLATWOODS				
8-G	Glena cognataria	CP: N.S.->FL	Bogs, flatwoods	Vaccinium, Prunus
8-G	Sphinx gordius	?	Flatwoods, barrens, pocosins	Vaccinium, Gaylussacia, Comptonia peregrina, Myrica
8-G	Paonias astylus	General	Barrens and flatwoods?	Vaccinium, Gaylussacia, Prunus, Salix
8-G	Datana major	General	Bogs, swamps, flatwoods	azaleas, Leucothoe, Lyonia (but not Vaccinium, Hamamelis, or Andromeda)
8-G	Datana ranaeceps	General	Bogs, flatwoods, pocosins	Leucothoe, Lyonia (but not Vaccinium or Andromeda, as has been reported)
8-G	Catocala gracilis	General	Barrens and flatwoods?	Vaccinium, Leucothoe
8-G	Catocala praeclara	General	Bogs and barrens	Aronia, Amelanchier (rarely)
8-G	Acronicta tritona	General	Barrens?	Rhododendron, Vaccinium
8-N	Spilosoma dubia	N: (rare in SE, including FL)	Barrens and bogs	Prunus, Vaccinium, Plantago and probably many other herbs
8-S	Stenaspilatodes antidiscaria	S: NJ->FL	Pine barrens?	Unknown (Ericaceae are accepted in captivity but cannot be reared on them)
8-S	Pero zalissaria	S: NJ->FL	Bogs and other wetlands?	Myricaceae, Baccharis, Solidago sempivirens
8-S	Metarranthus lateritiaria	S/CP: NC->	Unk	Ericaceae?
8-S	Agrotis buccholzi	S: NJ & NC	Pine barrens and flatwoods	Pyxidanthera barbulata
X. SAVANNAS, WET SWALES, AND BOGS				
9-G	Scopula purata	CP: NH->FL	Open acidic bogs and wetlands	forbs (reared on Taraxcum -- Franclemont, 195?)
9-G	Macrochilo hypocritalis	G:	Wetlands	Carex?
9-G	Macrochilo louisiana	General	Wetlands	Carex?
9-G	Lithacodia bellicula	General	Bogs	Carex?
9-G	Papaipema appassionata	General	Bogs	Sarracenia
9-G	Amolita fessa	General	Open wetlands	Poaceae
9-G	Amolita roseola	General	Bogs?	graminoids?
9-N	Hypenodes fractilinea	N: N.S.-neVA (and FL)	Grassy wetlands?	
9-N	Exyra fax (=rolandiana)	N: ME->NC	Bogs	Sarracenia purpurea
9-S	Gabara distema humeralis	S: NC->	Savannas and barrens	graminoids?
9-S	Gabara pulverosalis	S/CP: NJ->	Savannas and barrens	graminoids?
9-S	Argyrostrotis erasa	S: NC->	Savannas	
9-S	Argyrostrotis deleta	S: NC->	Savannas	
9-S	Doryodes n. sp.	S:	Wiregrass savannas	Poaceae
9-S	Exyra ridingsii (= nigrocaput)	S: NC->	Bogs	Sarracenia flava
9-S	Acronicta sinescripta	S: NC->	Grassy wetlands?	
9-S	Spartiniphaga carterae	S: NJ & NC	Swales and savannas	Calamovilfa brevipilis
9-S	Amolita obliqua	S: NC->	Open wetlands	Poaceae?
9-S	Euagrotis lubricans	S: NC->FL (Ohio)	Wiregrass savannas	Poaceae?
9-S	Hemipachnobia s. subporphyrea	S: NC	Savannas	Dionaea

	Species	Distribution	Habitats	Phagy Host Plants
XI. CYPRESS SWAMPS, MARSHES, AND RIPARIAN AREAS				
10-G	Semiothisa gnophosaria	General	Wetland edges	Salix, Larix?
10-G	Petrophora divisata	General	Coastal marshes	ferns?
10-G	Anticlea multiferata	N: Lab.->NC (Miss.)	Riparian areas	Justicia, Epilobium?, other herbaceous species?
10-G	Clostera inclusa	General	Riparian and wetland edges	Populus, Salix
10-G	Melanomma auricintaria	General	Forests and wetlands	Cephalanthus (but not Vaccinium, as has been reported)
10-G	Ledaea perditalis	General	Wetlands	Scirpus cyperinus (Cephalanthus seem doubtful)
10-G	Enigmogramma (= Argyrogramma) basigera Hydrocotle		General	Wetlands
10-G	Nola pustulata	N: N. Engl., sNJ->wNC	Bogs and swamps	Lyonia ligustrina
10-G	Bagisara rectifascia	General	Wetlands	Hibiscus, other Malvaceae
10-G	Simyra henrici	General	Marshes	Populus, Salix, Typha, Poaceae
10-G	Fagitana littera	CP: N.B.-> (also Ohio)	Wetlands	Thelypteris palustrus and other ferns
10-G	Stiriodes obtusa	General	Wetlands?	
10-S	Semiothisa aequiferaria	S:	Cypress swamps	Taxodium
10-S	Chloropteryx tepperaria	S: NJ->	Unk	Taxodium?, Rhus copallina? (food in the wild is unknown)
10-S	Callopistria floridensis	S:	Wetlands?	ferns
10-S	Emarginea percara	S: sVA->	Cypress swamps?	Tillandsia?

BUTTERFLIES

I. GENERAL HABITATS

1-G	Eurytides marcellus	General	Bottomlands, flatwoods	Asimina
1-G	Phoebis sennae eubule	S/Migrant	Open and semi-open areas	Cassia
1-G	Cercyonis pegala	General	Open woodlands, bogs, fields	Poaceae
1-G	Epargyreus clarus	General	Forests and fields	Fabaceae
1-S	Calycopis cecrops	S: NY->TX	Open woods and old fields	dead leaves, Myrica, Rhus, Quercus

II. CROPLANDS AND GENERAL OPEN AREAS

2-G	Colias eurytheme	General	Open areas	Fabaceae, alfalfa, clover, vetch

III. NON-AGRICULTURAL OPEN AREAS

3-G	Papilio polyxenes asterias	General	Open areas	Apiaceae
3-G	Strymon melinus	General	Open areas	forbs
3-G	Everes comyntas	General	Open areas	Fabaceae
3-G	Phyciodes tharos	General	Open areas	Aster

	Species	Distribution	Habitats	Phagy Host Plants
3-G	Vanessa cardui	Migrant	Open areas	forbs
3-G	Danaus plexippus	General	Open areas	Asclepidaceae
3-G	Thorybes bathyllus	General	Open areas	Fabaceae
3-G	Wallengrenia egeremet	General	Open areas	Poaceae, Panicum
3-G	Atalopedes campestris	S/Migrant	Open areas	Poaceae
3-G	Panoquina ocola	S/Migrant	Open areas	Poaceae
3-S	Eurema lisa	S/Migrant	Dry, open areas	Cassia
3-S	Eurema nicippe	General	Open areas	Cassia
3-S	Euptoeita claudia	S/Migrant	Open areas	Passiflora, Viola, forbs
3-S	Vanessa virginiensis	S/Migrant	Open areas	Compositae
3-S	Junonia coenia	S/Migrant	Open areas	forbs
3-S	Urbanus proteus	S/Migrant	Open areas	Fabaceae
3-S	Erynnis zarucco	S: NJ->TX	Open areas	Fabaceae, Robinia
3-S	Pyrgus communis	S/migrant	Open areas	Malvaceae
3-S	Hylephila phyleus	S/Migrant	Open areas	Poaceae
3-S	Polites vibex	S: NJ->	Open areas	Poaceae
3-S	Lerodea eufala	S/Migrant	Open areas	Poaceae
IV. Open grassy areas (general)				
4-G	Nastra lherminier	General	Open grassy areas	Poaceae, Schizacharium scoparius
4-G	Polites themistocles	General	Open grassy areas	Poaceae, Panicum
4-G	Polites origenes	General	Open grassy areas	Poaceae, Tridens
4-S	Copaeodes minima	S: NC->	Open grassy areas	Poaceae
4-S	Wallengrenia otho	S:MD->	Open grassy areas nr. wetlands	Poaceae
V. Hardwood forests (general)				
5-G	Papilio glaucus	General	Hardwood forests	hardwoods, shrubs
5-G	Papilio troilus	General	Hardwood forests	Lindera, Sassafras
5-G	Papilio palamedes	CP: NY->TX	Hardwood swamps	Persea, Sassafras?
5-G	Limenitis arthemis astyanax	General	Hardwood forests	hardwoods, shrubs
5-S	Atlides halesus	S: NJ->s	Hardwood forests and swamps	Phoradendron
VI. Pocosins, canebrakes, and other shrubby wetlands				
6-S	Celastrina argiolus complex	Unk	Pocosins	Ilex glabra?
6-S	Poanes yehl	S: VA->	Swamps and wet woodlands	Arundinaria?
6-S	Amblyscirtes carolina	S: VA->	Swamps and bottomlands	Arundinaria?
VII. Barrens and flatwoods				

	Species	Distribution	Habitats	Phagy Host Plants
8-G	Erynnis baptisiae	General	Open woods and barrens	Fabaceae, Baptisia, Lupinus, Coronilla
8-S	Calephelis virginiensis	S: VA->TX	Pine savannas and flatwoods	Cirsium horridulum
VIII. SAVANNAS, WET SWALES, AND BOGS				
9-G	Euphyes dion	General	Bogs, marshes, savannas	Cyperaceae, Scirpus cyperinus, Carex
9-S	Neonympha areolatus	S: NJ->TX	Savannas and barrens	graminoids
9-S	Problema byssus	S: NC-> (& Midwest)	Savannas, sandhills, prairies	Tripsacum dactyloides
9-S	Amblyscirtes alternata	S: NC->TX	Savannas and open pine woods	unknown
9-S	Oligoria maculata	S: NC-> (& NJ)	Savannas and swamps	Poaceeae
IX. CYPRESS SWAMPS, MARSHES, AND RIPARIAN AREAS				
10-G	Limenitis archippus	General	Wetland edges	Salix
10-G	Atrytone logan	General	Marshes and wet grasslands	Poaceae
10-G	Euphyes vestris	General	Wetland edges	Cyperaceae
10-S	Hermeuptychia sosybius	S: NJ->s	Lowland forests	Poaceae
10-S	Thorybes confusis	S: NJ->TX	Riparian and wetland edges	Fabaceae?
10-S	Lerema accius	S/Migrant	Open grassy wetlands	Poaceae

GRASSHOPPERS

I. GENERAL HABITATS				
1-G	Arphia xanthoptera	General	Open woods and fields	graminoids, forbs
1-G	Pardalophora phoenicoptera	General	Open woods and fields	graminoids, forbs
1-G	Spharagemon bolli	General	Dry, open areas	graminoids, forbs
1-G	Melanoplus sanguinipes	General	General	graminoids, forbs
1-G	Schistocerca americana	General	General	graminoids, forbs
1-G	Schistocerca rubiginosa	S: NJ->	Dry, shrubby and open areas	graminoids, forbs
1-S	Amblytropidia mysteca	S: VA->TX	Fields and open pine woods	graminoids, forbs
II. CROPLANDS AND GENERAL OPEN AREAS				
3-G	Syrbula admirabilis	General	Open areas	graminoids, forbs
3-G	Orphulella pelidna	General	Open areas	graminoids, forbs
3-G	Chortophaga viridifasciata	General	Open areas	graminoids, forbs
3-G	Dissosteira carolina	General	Open areas (roadsides)	graminoids, forbs
3-G	Psinidia fenestralis	General	Sandy open areas	graminoids, forbs

	Species	Distribution	Habitats	Phagy Host Plants
3-G	Melanoplus differentialis	General	Open areas	graminoids, forbs
3-S	Spharagemon cristatum	S: VA->	Open areas	graminoids, forbs
III. NON-AGRICULTURAL OPEN AREAS				
4-G	Dichromorpha viridis	General	Open grassy areas	graminoids, forbs
IV. POCOSINS, CANEBRAKES, AND OTHER SHRUBBY WETLANDS				
6-G	Schistocerca alutacea	General	Shrubby and grassy wetlands	graminoids, forbs
6-S	Melanoplus nubilus	S: NC (Fayetteville)	Pocosins?	graminoids, forbs
6-S	Paroxya atlantica	S: NJ->	Shrubby wetlands and edges	graminoids, forbs
V. BARRENS AND FLATWOODS				
8-S	Arphia granulata	S: NC->	Flatwoods, open areas	graminoids, forbs
VI. SAVANNAS, WET SWALES, AND BOGS				
9-G	Dichromorpha elegans	General	Bogs, savannas, marshes	graminoids, forbs
9-G	Stethophyma celata	N: MA-SC (& Midwest)	Bogs, wet tallgrass prairie	Cyperaceae?
9-S	Mermiria picta	S: VA->	Savannas and flatwoods	graminoids, forbs
9-S	Melanoplus decorus	S: NC (New Bern->S)	Pocosin/Savanna ecotones	graminoids, forbs
9-S	Melanoplus decorus group	S/CP: NC->	Pocosin/Savanna ecotones	graminoids, forbs
9-S	Melanoplus femurrubrum propinquus	S/CP: NC->	Savannas and flatwoods	graminoids, forbs
VII. CYPRESS SWAMPS, MARSHES, AND RIPARIAN AREAS				
10-S	Leptysma marginicollis	S: MD->	Marshes and wetland edges	graminoids, forbs

APPENDIX C

Sampling Schedule and Weather Data

TRIP NO.	DATE	TEMPERATURE	SKY CONDITIONS
1	12/IV/91	upper 50's at dusk	no precipitation
	13/IV/91	low 70's during the day; low 60's at dusk	no precipitation
	14/IV/91	low 70's during the day	no precipitation
2	8/V/91	mid 70's during the day; mid 60's at dusk	no precipitation
	9/V/91	mid 70's during the day; mid 60's at dusk	steady rain beginning in the morning; ended around 1900
	10/V/91	upper 70's	mostly cloudy; humid
3	10/VI/91	70° at dusk	clear but humid; breezy
	11/VI/91	65° at 2305	completely overcast in the afternoon
	12/VI/91	upper 70's at 1030	clearing after thin overcast
4	10/VII/91	82° at 1951	still and humid at dusk
	11/VII/91	90° at 1030; 73° at 2230	heavy rain began at 1500; continued until 1900
	12/VII/91	91° at 1330	partly cloudy55/VIII/9181° at 2200 periodic thunderstorms
	6/VIII/91	79° at 2220	periodic heavy thunderstorms; mostly ended by afternoon
	7/VIII/91	80's	thunderstorm after 1515
6	9/IX/91	80's during the day; 70° at 2140	partly cloudy; humidity relatively low
	10/IX/91	80's during the day	partly cloudy; breezy

TRIP NO.	DATE	TEMPERATURE	SKY CONDITIONS
	11/IX/91	80's during the day	high cirrus; breezy
7	9/X/91	low 80's during the day; low 60's at 2200	overcast; breezy
	10/X/91	mid 70's during the day; 58° at 2115	partly cloudy
	11/X/91	upper 70's during the day	clear; breezy
8	4/V/92	76° at 1420; 64° at 2030; overnight low was 46°	clear early; cirro-stratus in afternoon; breezy
	5/V/92	74° at 1345	overcast by afternoon; breezy
9	24/VI/92	90° at 1620; 76° at 2030; overnight low was 71°	overcast early but clearing in afternoon
	25/VI/92	88° at 1000	clear; windy in the afternoon
10	1/IX/92	80's during the day; 70's at dusk	clear and calm
	2/IX/92	80's during the day	clear
	3/IX/92	80's during the day	rain before 1030; clearing in the afternoon