Contributions Toward a Lepidoptera (Psychidae, Yponomeutidae, Sesiidae, Cossidae, Zygaenoidea, Thyrididae, Drepanoidea, Geometroidea, Mimalonoidea, Bombycoidea, Sphingoidea, & Noctuoidea) Biodiversity Inventory of the University of Florida Natural Area Teaching Lab

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Abstract

A systematic check list of 489 species of Lepidoptera collected in the University of Florida Natural Area Teaching Lab is presented, including 464 species in the superfamilies Drepanoidea, Geometroidea, Mimalonoidea, Bombycoidea, Sphingoidea, and Noctuoidea. Taxa recorded in Psychidae, Yponomeutidae, Sesiidae, Cossidae, Zygaenoidea, and Thyrididae are also included. Moth taxa were collected at ultraviolet lights, bait, introduced Bahiagrass (*Paspalum notatum*), and by netting specimens. A list of taxa recorded feeding on *P. notatum* is presented.

Introduction

The University of Florida Natural Area Teaching Laboratory (NATL) contains 40 acres of natural habitats maintained for scientific research, conservation, and teaching purposes. Habitat types present include hammock, upland pine, disturbed open field, cat tail marsh, and shallow pond. An active management plan has been developed for this area, including prescribed burning to restore the upland pine community and establishment of plots to study succession (http://csssrvr.entnem.ufl.edu/~walker/natl.htm). The site is a popular collecting locality for student and scientific collections.

The author has done extensive collecting and field work at NATL, and two previous reports have resulted from this work, including: a biodiversity inventory of the butterflies (Lepidoptera: Hesperioidea & Papilionoidea) of NATL (Kons 1999), and an ecological study of *Hermeuptychia hermes* (F.) and *Megisto cymela* (Cram.) in NATL habitats (Kons 1998). Other workers have posted NATL check lists for Ichneumonidae, Sphecidae, Tettigoniidae, and Gryllidae (http://csssrvr.entnem.ufl.edu/~walker/insect.htm). The primary purpose of this paper is to report the documented (with collected voucher specimens) diversity and composition of NATL's moth fauna in the families/superfamilies Psychidae, Yponomeutidae, Cossidae, Zygaenoidea, Thyrididae, Geometroidea, Mimalonoidea, Bombycoidea, Sphingoidea, and Noctuoidea. Specimens were collected from other families as well, especially Pyralidae and Tortricidae; however, these taxa are excluded from the present report as the author has not yet studied these groups to the extent of being able to make reliable determinations. A list of taxa recorded feeding on introduced Bahiagrass (*Paspalum notatum*) is also presented. Information on nightly species lists resulting from each survey technique, such as presented for the Katharine Ordway Preserve and several localities in the Florida panhandle in Kons (2000a) and Kons & Borth (2000A), respectively, has not been compiled for the many NATL survey dates. It is the author's intention to include this data in a future revision of this document, but a considerable amount of additional curatorial work and data compilation is needed before this goal can be accomplished.

A voucher specimen based inventory of insects is a crucial component of efforts to study and conserve natural habitats. Insects compose a large component of faunal biodiversity, and most if not all natural habitats probably contain more species of just Lepidoptera than all vertebrates combined. Managers of natural areas (or other outdoor research facilities) who

impose restrictions on potential researchers that result in no surveys being done preclude the possibility of even evaluating if the habitats they manage are being maintained, improved, or degraded for biodiversity over time. Preserved sites such as NATL which are still accessible for biodiversity research/collecting (without overbearing and/or unfeasible restrictions on access and crucial research/collecting activities) are essential to efforts to conserve and improve the scientific understanding of natural habitats. The research presented in this document is part of a larger effort to contribute to the scientific understanding of the diversity, composition, distribution, phenology, and ecology of the Lepidoptera fauna of northern FL, undertaken by the author as a scientific hobby. Other documents resulting from this effort to date include Kons (1999), Kons (2000a), and Kons and Borth (2000a), and reports on additional surveys are in progress for the Katharine Ordway Preserve (Putnam County), Austin Cary Memorial Forest (Alachua County), Hwys 358 & 361 (Dixie County), Saddle Drive (Marion County), Aspalaga Bluff and other panhandle localities (Gadsden & Liberty Counties), and other north FL localities.

Bahiagrass (*Paspalum notatum*) is utilized by adult moths of a variety of species in northern peninsular Florida as a food source, as evidenced by observations of moths landed on the grass with their proboscis extended and in contact with the inflorescence. Moths have been observed feeding only when the grass is in its flowering stage. *P. notatum* is indigenous to eastern Argentina (Quarin et al. 1984), and is now extensively planted from seed along Florida Highways and in other subtropical and mild temperate areas (Floridaturf.com). Karr (1976) previously reported moths feeding on the spikelets of a related grass, *Paspalum virgatum* L., in the Panama Canal Zone. It is apparently unknown what exactly moths which visit *Paspalum* are feeding on, but Pohl et al. (1979) found evidence of the presence of *Claviceps* (an ergot fungus) on spikelet material from *P. virgatum* visited by moths. Since grasses are not known to possess extrafloral nectaries, and species of ergot produce nectar like secretions during their early conidial stages, Pohl et al. (1979) hypothesized that the moths they observed were feeding on such secretions.

Materials & Methods

Five survey techniques were used to survey for NATL moths: (1) collecting at lights: attracting nocturnal moths to a sheet with a 15 watt BL UV light and collecting from lighted storage buildings next to the NATL woods, (2) baiting trees with a mixture of bananas, brown sugar, syrup, and apple cider vinegar, (3) searching introduced Bahiagrass (*Paspalum notatum*) for nocturnal species, (4) tapping trees during the day to uncover *Catocala* species, and (5) netting specimens on the wing, resting on vegetation, or nectaring on flowers during the day and night. Blacklighting and baiting are discussed in more detail in Kons' (1996b) *Techniques for Collecting and Curating* Lepidoptera. Numerous surveys were conducted for entire or nearly entire nights and covered all months of the year. However, the battery used to power the UV light could only run the light for about six hours, and the UV light was usually run from dusk until the battery died. The authors' NATL moth surveys occurred between September of 1996 and 1998 (inclusive), with the most intensive effort from Sept. to mid December of 1996 and late January-June of 1997. Some additional surveys are ongoing. Locations of bait trails and UV sheet set ups are presented in Figure 1. Also, I have included records of moths collected around lights shining on the NATL woods from a storage building (see Figure 1).

The author has also done substantial collecting within one mile of the NATL boundary on SW 20th Avenue and Hull Road, beginning in late August of 1996 and continuing to the present. My main night collecting localities in the vicinity of NATL include the Woods Apartment Complex on SW 20th Avenue across the road from SW 38th Terrace, a woods and power line cut north of SW 20th Avenue just west of SW 38th Terrace, the University of FL Southwest Recreation Center Tennis Courts on Hull Road, and flower beds of Lantana, Pentas, and other flowers attractive to crepuscular moths around the University of FL Entomology Building on

Natural Area Drive. Specimens from The Woods Apartments were taken primarily at a 15 watt UV light hanging in a window near the edge of a forested tract (some were also taken in the design of inverted cone bait trap figured in Kons (1996b)), the SW 20th Avenue site northwest of The Woods Apartments was surveyed with a 15 watt UV light (via a sheet and a the light trap type figured in Kons (1996b)) and a bait trail, and specimens from the SW Rec. Center were found on the ground or landed on screening underneath powerful MV lights used to light the tennis courts.

All NATL Lepidoptera records are based on collected voucher specimens currently housed in the author's research collection in Gainesville, Florida. Some specimens have individual data and determination labels, and the data for these specimens has been recorded in annual collecting notebooks; however, many of the moths collected on NATL surveys are currently arranged next to header labels. In the preparation of this document, the author reexamined each box containing NATL material in an attempt to record each species represented from NATL. However, since data has not been recorded and compiled for many specimens, it is possible some species collected from NATL surveys could have been overlooked with this approach. While I hope to produce a more detailed report listing the species recorded on each survey date in the future, much additional curatorial work is needed before this can be achieved.

Results

Four hundred eighty-nine species of Lepidoptera have been recorded from NATL in the families Psychidae, Yponomeutidae, Sesiidae, Cossidae, Zygaenidae, Megalopygidae, Limacodidae, Drepanidae, Geometridae, Epiblemidae, Mimalonidae, Lasiocampidae, Saturniidae, Sphingidae, Notodontidae, Arctiidae, Lymantriidae, and Noctuidae, including 463 species in the macrolepidoptera families (Geometridae through Noctuidae). Most taxa have been determined to the species level, but a few are determined only to genus but known to be different species from any others on the list. A complete check list for these families is presented in Table 1. A few taxa in Table 1 have a "?" following the species name, as these taxa have not yet been reliably identified. Fifty -six additional species in the above families have been recorded less than one mile from the NATL boundary (Table 2). To the left of each species name in Tabels 1 & 2 is the number for Hodges et al. (1983) *Check List of the Lepidoptera of America North of Mexico*, which references the author and date of description for each species. Exceptions occur for a few taxa which lack a Hodges check list number. The classification used primarily follows Hodges et al. (1983), but incorporates some changes proposed in Poole (1989) and subsequent Moths of America North of Mexico fascicles, including Lafontaine and Poole (1991), Poole (1994), and Lafontaine (1998). I do not adopt the process of assigning new check list numbers to taxa thats systematic placement has changed.

Species hypothesized to be migrants or strays from south Florida (see Discussion) are designated "M" and "S", respectively, in Tables 1 and 2, while species hypothesized to be permanent residents of the Gainesville area (although not necessarily of NATL) are designated "R". Some poorly known taxa are given no R, M, or S designation. All but four of the taxa presented in Tables 1 and 2 were documented as a result of the author's collecting from the fall of 1996 through the present, and all of the NATL taxa have been recorded during this interval.

With the seventy-four NATL species in the superfamilies Hesperioidea and Papilionoidea presented in Kons (1999), plus five taxa in these superfamilies recorded since the time that document was prepared (*Thorybes bathyllus* (Hesperiidae), *Battus polydamus* (Papilionidae), *Nathalis iole* (Pieridae), *Feniseca tarquinius* (Lycaenidae), and *Leptotes cassius* (Lycaenidae)), the NATL Lepidoptera list now includes 564 species in 20 families (Thyrididae was also targeted in the inventory; however, no species were recorded from NATL, although one has been found less than one mile from the NATL border).

A minimum of 118 species of moths in three of the included families have been observed feeding on imported Bahiagrass (*Paspalum notatum*) within NATL, including 18 species of Geometrids, one Arctiid, and 99 species of Noctuids. A list of these taxa is presented in Table 3. Many additional undetermined species of Pyralidae were also collected feeding on this grass.

Discussion

An extensive amount of information has been obtained on the diversity and composition of the NATL moth fauna for the families included in this document. This information could prove valuable in evaluating if the NATL habitats are being maintained, improved, or degraded for Lepidoptera biodiversity over time, if additional surveys are conducted in the future. Efforts currently underway to restore part of the upland pine community may have the potential to affect the composition of the Lepidoptera fauna. Destruction of habitat around or within NATL, such as the recent clearing of two forested tracts along SW 20th Avenue between Hogtown Creek and the NATL border, and especially a proposed extension of SW 24th Avenue east of SW 34th street opposed by the NATL advisory committee, may negatively impact some NATL species.

The NATL moth list presented is also useful for working out the distributions and habitat associations of the Lepidoptera of Florida. The types of habitat currently contained within NATL appear to be widespread in northern FL (although not on the University of Florida campus), therefore species which are NATL residents are generally not predicted to be strongly associated with endangered or highly specialized habitats. However, species lists for sites like NATL are vital to evaluating the uniqueness of endangered or remnant habitats, and for formulating hypotheses on which species are strongly associated with specialized habitats (such as candidate species for being associated with long leaf pine/turkey oak scrub habitats presented in Kons (2000a)). A few of the moth taxa I have documented from NATL are species for which I have seen few or no additional specimens from other localities in Florida; however, this may be incidental to the very few people currently doing substantial moth surveys in Florida, the limited amount of Florida material I have examined, and/or the poor effectiveness of the survey methods employed for uncovering certain species. Examples of the few NATL species (excluding hypothesized non resident species) for which I have seen few additional Florida locality records include *Bomolocha mandefactalis* (widespread in some northern states), *Zale* sp. nr. *obliqua* #1, *Zale* sp. nr. obliqua #3, *Zale* sp. nr. *bucholzi*, *Oligia*? species, *Pyreferra ceromatica*, and *Leucania calidior* (a cane feeder).

A number of the species documented from NATL are species I hypothesize to be migrants or strays from southern Florida. I use the term "stray" (hypothesized strays are designated "S" in Tables 1 & 2) for taxa resident farther south in Florida which have been recorded as isolated occurrences, and the term "migrant" (hypothesized migrants are designated "M" in Tables 1 and 2) for taxa which cannot overwinter as far north as NATL (at least during some seasons) but appear in numbers during some or all seasons. I interpret two types of available evidence as consistent with a migratory hypothesis: (1) adults of a taxon have been recorded only in the late summer or fall in the vicinity of NATL, but these taxa occur year round in southern Florida, or (2) the dates of first recorded adult occurrence for a taxon vary greatly between years (differing by one to eight months between some years). In addition to meeting one or both of these criteria, for some species designated "M" the first specimen(s) collected during one or more years have been in worn condition, which arguably provides some supplementary evidence for a migratory hypothesis. Flight season data considered in formation of these hypotheses included NATL data as well as records from other sites the author has collected in northern FL (records from a UV light run at the Woods Apartments almost every night between late August of 1996 and Dec. 2000 were particularly helpful in looking for highly erratic first occurrence dates between years, as well as an ongoing study of the American Entomological Institute property (3005 SW 56th Ave S of Gainesville)). South Florida phenology data was

obtained from Kimball (1965), the Florida State Collection of Arthropods, and part of the Terhune Dickel collection which was being stored in the FSCA. The difficulty in knowing how well recorded first occurrence dates correspond to actual first occurrence dates in nature is a potential source of error in using this approach to hypothesize which species are migratory. Some possible resident taxa occur year round in the Gainesville area with records including every month, but may be rare during the winter and spring while common during the late summer and fall. Resident taxa that potentially exhibit this type of abundance pattern may be misinterpreted as migratory by not being detected early in their flight season when they are relatively rare.

Many if not all of the taxa hypothesized to be migrants to NATL appear to establish breeding populations in the Gainesville area during some years, as evidenced by numbers of adults found in fresh condition and/or larvae collected which were reared to the adult stage. Some of the taxa hypothesized to be migrants from south Florida appear to become established by the fall every year, and some of them become quite common. Other hypothesized migrants are more ephemeral, appearing during some years and not others. Examples of hypothesized migrants recorded from NATL (and/or within one mile of the NATL border) with an apparently ephemeral non-annual occurrence in the Gainesville area include *Melanchroia cephise, Erinnyis obscura, Aristaria theroalis, Physula albipunctilla, Rivula pusilla, Anomis illita, Ephyrodes cacta, Melipotis fasciolaris, Melipotis acontioides,* and *Alabama argillacea*. Of course, it is possible these species became established some years when they were not detected.

My hypotheses of resident status for moths in the Gainesville area are derived from first recording fresh adults of a species at a similar time of year between years, collectively considering flight data from NATL and near by collecting sites. While the NATL butterfly checklist (Kons 1999) distinguished between species I hypothesized to be permanent NATL residents versus species which may be Gainesville area residents which disperse into NATL, I avoid making this distinction for the moth species covered in this report. Due to the poor effectiveness of blacklighting in NATL, the sporadic effectiveness of baiting (see below), the limited number of all night NATL surveys subsequent to 1998, and poor knowledge of many moth's larval hosts and/or specific habitat requirements, I do not feel at this point that there is adequate evidence to make this distinction for most moth species. Furthermore, I am uncertain if some NATL resident species are also dependent on natural habitats beyond the NATL border to sustain viable populations over time (i.e. if most of the unprotected habitat in the vicinity of NATL is destroyed in the future, how will this impact the diversity of the NATL moth fauna?). Some difficulties associated with determining resident status and habitat association are discussed in Kons (1999) and Kons and Borth (1996), respectively.

While I suspect my surveys of NATL have uncovered the majority of resident and regular migratory species, I suspect there are numerous species that have not yet been recorded from NATL in the families covered by this paper (in contrast to the situation for superfamilies Hesperoidea and Papilionoidea). The 56 species recorded from less than one mile from the NATL provides some evidence for this hypothesis, although seven of these species may be rare strays to the Gainesville area. A huge impediment to a survey of NATL moths is that the light pollution around NATL is so extensive that UV lights work very poorly at attracting moths relative to areas with little light pollution. A common pattern in conducting NATL surveys was to find no specimens of a number of species at lights on the same nights these species were found in abundance at bait or *P. notatum*. This applies to species which have been found to readily come to UV lights in surveys conducted in areas with minimal light pollution. While collecting at lights is generally the most effective method for surveying for adults in moth biodiversity inventories (see Kons (1996a), Kons & Borth (1997), Kons & Borth (2000a), Kons (2000a), and Kons & Borth (2000b)) this was never the case in NATL on nights when the bait trail was attracting substantial numbers of moths or when *P. notatum* was flowering. Since many species of moths come readily to lights and rarely if ever to bait (see aforementioned references) the relative ineffectiveness of UV lights in NATL may have significantly diminished the number of

species recorded, despite the considerable number of survey nights. Also, the failure to run lights all night due to the limitations of battery power no doubt reduced the number of species that were recorded. Future surveys including the array of light survey stations (including a mercury vapor light) used to conduct the surveys presented in Kons (2000a) and Kons & Borth (2000a) could potentially add considerably to the number of NATL species recorded from lights.

The effectiveness of a bait trail in northern Florida is extremely variable and unpredictable. At times each baited tree may contain roughly 50 to 100+ moths, while at other times over 100 baited trees may only yield less than ten specimens even with an all night survey conducted under warm and humid conditions (see also Kons (2000a)). It has been my experience that a bait trail has worked poorly almost every time I have tried one in north FL hammocks between June and mid August (inclusive) while success during the spring, fall, and winter is highly unpredictable. A generalization is that bait trails were often moderately to highly effective in the NATL and/or other north peninsular Florida hammocks during mid Sept.-mid December 1996, February-May 1997, late September-October 1998, late October-November 1999, and early April-May 2000. Attempts with baiting were generally poorly effective during the spring of 1998 and 1999, Feb.-early March 2000, and Sept.-early October 1999.

As also discussed in Kons (2000a), the effectiveness of a bait trail often appears to have little if anything to do with the abundance of moths, and may reflect relative differences in the extent of competition from natural food sources. Few or no individuals were recorded at bait on some dates for some species (which have been found abundantly at bait on other dates) which were found commonly at *P. notatum*, by tapping, or by being flushed from vegetation on the same dates. Additional evidence supporting the above hypothesis is derived from finding particular species common at both lights and bait on some dates and at lights but not bait on others for localities with minimal light pollution (Kons 2000a).

These times of year when moths have been collected at *Paspalum notatum* include at least mid July to early October, although the phenology may vary between seasons. While I have not compiled exact species totals for particular survey nights, during July and August a greater diversity of moths were recorded feeding on this grass in NATL than were found at UV light or at bait. While *P. notatum* is common in the vicinity of NATL, more than minimal numbers of moths have only been observed feeding on this plant in close proximity to the margins of forested tracts, and not along roads or sidewalks not adjacent to forested tracts. In NATL areas of *P. notatum* visited by large numbers of moths were concentrated around the south and west margin of the pond (labeled Seep on Figure 1) and low areas on or adjacent to trails between the east entrance and the eastern part of the old field (at least during 1996-1997 when most of these observations were made).

At least 118 species of NATL's moths covered in this report utilize *P. notatum* (an introduced species which in NATL grows only in recently disturbed areas) as a food source. A large number of undetermined Pyralid species (estimated to be in excess of 50 at a minimum) utilize this plant as a food source as well. It is unknown how the presence of this food source has influenced the abundance of moth species or the composition of the NATL moth fauna. Mowing some areas to promote the presence of *P. notatum* (during a time of year when this plant is not in bloom) may improve habitat for moths by creating an extensive adult food source, while mowing *P. notatum* when it is in bloom could potentially negatively impact moths by removing this food source.

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Additional surveys in NATL would be valuable to further document the diversity, composition, phenology, and ecology of NATL's moth fauna. Surveys with more powerful lights than those I used when conducting this research, such as mercury vapor lights, may have the greatest potential to add additional species to the NATL list, but further information resulting

from any of the survey techniques would be valuable. Beneficial consequences of the absence of restrictions on collecting insects within NATL and 24 hour access to the site include the availability of the information presented in Kons (1998b), Kons (1999), and this document, and I strongly encourage the NATL advisory committee to continue these policies in order to encourage and keep viable future survey work. I also encourage managers of other facilities to examine the results of these policies and attempt to emulate them.

While NATL is not a unique habitat, and its value as a study site for nocturnal Lepidoptera is to some extent undermined by the amount of light pollution from adjacent sources, I strongly feel NATL is a highly valuable study site for studies of insect biodiversity for the combination of several reasons: (1) potential researchers who wish to collect insects do not have to contend with restrictions on collecting for scientific study, (2) researchers are allowed 24 hour access to the site, (3) NATL contains a substantial diversity of Lepidoptera and other species of insects, and (4) NATL is located across the road from the University of FL Entomology Building. While concerns raised about the decline of taxonomy and few people trained to survey for or reliably identify insects are well founded in my view, I often suspect in many areas an even more serious problem with respect to efforts to study and conserve biodiversity is the lack of suitable study sites for those few people who are qualified and motivated to conduct insect surveys. Management of many "preserved" lands or outdoor facilities have imposed restrictions on collecting insects and/or access to sites, often without the input of personnel with extensive training in systematic and ecological entomology, which have prevented or discouraged studies of insects such as the ones presented in this document, Kons (1994), Kons (1995), Kons (1996a), Kons (1998a), Kons (1998b), Kons (1999), Kons (2000a), Kons (2000b), Kons (2000c), Kons and Borth (1992), Kons and Borth (1996), Kons and Borth (1997), Kons and Borth (2000a), and Kons & Borth (2000b). Sites not part of preserves or research/teaching facilities may be relatively unsafe for personnel and their unattended equipment. Also, at such sites the habitat may be destroyed in the future, thereby reducing the value of survey work to a historical record of extirpated species.

Consequently, I strongly feel that NATL is a valuable asset to the mission of the University of Florida and to the scientific community, with respect to being a suitable site for studies of insect biodiversity plus the numerous other scientific and educational benefits listed on the NATL web site. I therefore recommend that the maintenance and protection of this facility be a high priority for the University of Florida, and also encourage the preservation of other remaining tracts of natural habitat on the University of FL campus. The chair of the Natural Area Advisory Committee recently wrote a letter dated 16 October 2000 on behalf of this committee with respect to a proposed expansion of SW 24th Ave. east across SW 34th St. to meet Archer Road in the vicinity of Surge Area (=Natural Area) Drive. The NATL committee has recommended that the University of Florida oppose this expansion, for reasons including that the expansion would reduce the size of NATL's already small tracts of habitat, harm wildlife, impact wetlands and drainage, and because in summary "adverse effects [from the proposed expansion] on NATL's value to the University of Florida are unacceptable." I strongly concur with the NATL Advisory Committee's recommendation.

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To contribute information on NATL moths for future revisions or addendums, provide feedback on this document, and/or request additional information, contact Hugo L. Kons Jr. at 3751 SW 20th Ave. No. 34, Gainesville, FL 32607 or hlko@gnv.ifas.ufl.edu.

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Appendix: Footnotes for Tables 1 and 2

{1.} I am uncertain as to whether the name *deplanaria* or *pectinaria* correctly applies to these specimens; however, I think only one species is represented.

{2.} I am uncertain as to whether the name *packardi* and/or *benjamani* applies to these specimens.

{3.} Some specimens may also be *Leptostales hepaticaria*.

{4.} There is an undescribed species near *pallida* in Florida (Douglas Ferguson, pers. com. 2001). I am uncertain if NATL specimens are true *pallida* or the undescribed species. They are smaller than specimens of *pallida* from Wisconsin series.

{5.} I regard *Cisthene striata* as a synonym of *C. plumbea*. Series I have collected from Gadsden and Liberty Counties in the panhandle are all the *plumbea* phenotype, while my series from Osceola County are all the *striata* phenotype. Series from the Gainesville area include both phenotypes with a continuum of intermediates.

{6.} At least one representative of each *Apantesis* species was identified by genitalic dissection.

{7.} Rings et al. (1992) mentions the occurrence of a species near *lituralis* in Ohio (I have not seen any specimens determined as this taxon). In FL, there is a common species which somewhat

resembles *lituralis* but is distinctly different enough as to be easily distinguished from it, and at least one taxon which is or closely resembles *lituralis*. I am uncertain as to whether FL specimens of the *lituralis* phenotype are true *lituralis* or the undescribed species mentioned by Rings et al. (1992).

{8.} It is possible some or all specimens may be *Bleptina sangamonia* (8372).

{9.} In my opinion two species are included under the name *fractilinea*, which occur sympatrically without intermediates in southeast Wisconsin.

{10.} While Hodges et al (1983) lists only one species of Phoberia in America north of Mexico, based on evidence provided from gaps in variation in the maculation and sympatric occurrences, between Florida and Wisconsin I believe I have collected at least five and up to seven distinct species in this genus, including up to five species in north peninsular Florida. *Phoberia atomaris* is common and generally distributed. What I for now term *Phoberia* sp. nr. *atomaris* #1 is a robust reddish phenotype which appears to be associated with turkey oak scrub and xeric oak-pine habitats. *Phoberia* sp. nr. *atomaris* #2 is widespread and generally distributed, although much less numerous than *atomaris*. It is dark brown with sharp contrasting cream AM and PM lines and an identically colored line along the basal edge of the reniform spot. There is diffuse cream dusting along most of the veins on the dorsal forewing. *Phoberia* sp. nr. atomaris #3 is a robust phenotype for which I have only one specimen (4 March 2000 at the Austin Cary Memorial Forest in Alachua County) and may be an aberration (more material is needed). *Phoberia* sp. nr. *atomaris* #4 may be red or brown, but has sharp contrasting orange AM and PM lines. Two additional distinctive phenotypes occur sympatrically with *automaris* in Central Wisconsin for which I have not as yet seen any Florida material. Extensive genitalic studies and potentially biological information are needed to better understand the species level taxonomy of this genus.

{11.} Based on gaps in maculation variation, sympatric occurrence, and differences in phenology, I have concluded at least two and possibly three undescribed species of *Zale* occur in north peninsular FL which resemble *Zale obliqua*. *Zale obliqua* has been recorded from all months of the year in the Gainesville area and is generally distributed. This taxon is variable in the intensity of blue-gray scaling and amount of contrasts, but does not have the median band pass basal to the reniform spot (this character is noted in Rings et al. (1992)). My series of *Z. obliqua* from FL exhibit a considerable range of variation while specimens I have examined from Wisconsin (a much smaller series than from Florida) are fairly uniform in appearance; however, I have found no indication of additional gaps in this range of variation. *Zale* sp. nr. *obliqua* #1 has rarely been collected, and differs from *obliqua* in having the basal side of the median band pass distinctly in front of the reniform spot. Based on the limited amount of material dissected so far, there appear to be slight differences in the shape of a valve process compared with *obliqua*, but more material needs to be examined to determine if these differences are consistent or incidental to the small sample size examined to date. Flight dates range from 2 February to 10 March, with one outlying record of a fresh specimen from 16 April (possibly another species?). While apparently rare at lights and bait in the habitats surveyed thus far, this taxon is probably generally distributed, although to my knowledge it has thus far only been recorded from NATL, SW 20th Avenue in Gainesville, SW 56th Ave. S of Gainesville, and at the Austin Cary Memorial forest. *Zale* sp. nr. *obliqua* #2 also has the median band pass in front of the reniform (more narrowly relative to species 1) but differs in having the basal edge of the median band strongly contrasting (slightly or non-contrasting in species 1). Males may also be separated from *obliqua* and sp. nr. *obliqua* #1 by the shape of the valvae. It is much easier to collect than species 1, but appears to be primarily associated with pine flatwood habitats and has not been recorded from NATL (all specimens have come from pine flatwoods or areas immediately adjacent to pine flatwoods, with the exception of a few specimens from SW 56th Ave. where the species was rarely collected during frequent 2001 surveys). Flight dates range from 4 March to 24 July, but most records to date are from the first half of March. *Zale* sp. nr. *obliqua* #3 is based on one NATL specimen (21

June 1998 at bait), and may be an aberration or a distinct species (I cannot separate it based on male genitalia), and has not been counted in the species total at this point. Like *Z. obliqua*, the median band does not pass in front of the reniform spot on the basal side. More material and extensive genitalic studies are needed to more reliably sort out the conifer feeding *Zale* of northern Florida.

{12.} This taxon occurs sympatrically with *Z. bucholzi* without intermediates, and is a lighter brown with a more washed out appearance. I am unsure if the flight seasons overlap; dates for *Z. bucholzi* from north peninsular FL range from 24 Feb.-24 March while the two specimens of *Z.* nr. *bucholzi* are from 7 and 13 April. Eric Quinter examined the specimens (April 2001) and believed them identical to specimens he has collected in coastal South Carolina, for which the genitalia differ from nominate *Z. bucholzi* (Quinter, pers. com. 2001).

{13.} Two species have been included under the name *furcilla*, which differ in the structure of the vesica (Eric Quinter, pers. com. 2001).

{14.} Two species are included under the name *henrici* (Quinter, pers. com. 2001). I believe my series from NATL and northern Florida contain only one species, and I am uncertain if they are nominate *henrici* or an undescribed species.

{15.} This is a small gray taxon which most closely resembles species which have been placed in the genus *Oligia*, at least superficially. It has been collected at lights, bait, and at *Paspalum notatum* in and at the edge of moist forested areas containing cane.

{16.} Terhune Dickel recently showed me specimens determined as *Leucania latiuscula* and *L. subpunctata*. Both species are common in NATL and generally distributed in north peninsular FL, but they are often misidentified. I have concluded that Kimball's (1965) specimen on Plate XII No. 11 identified as *juncicola* is actually *latiuscula*. The specimen plated as *latiuscula* (Plate XII No. 12) appears to be *subpunctata*.

{17.} I have only dissected a couple of NATL males of this phenotype, and they are *L. adjuta*. A very similar species in terms of maculation but with distinctive genitalia, *L. infatuans*, has been collected as far north as Marion County (Terhune Dickel, pers. com. 2001). A long series of the *adjuta* phenotype has been collected in NATL, and as more specimens are dissected some could potentially turn out to be *L. infatuans*.

{18.} There is a specimen of this taxon in the Florida State collection of arthropods collected over thirty years ago labeled from the Doyle Conner Building (this building borders NATL on the corner of SW 34th Street and SW 20th Ave.). I have not encountered this species in or around NATL, and it appears to be associated with turkey oak scrub and perhaps other xeric oak-pine scrub habitats in north peninsular Florida (Kons 2000a). Turkey oak scrub habitat formerly occurred in and in the vicinity of NATL (NATL.htm) and SW 20th Avenue (Dale Habeck, pers. com. 1997), but does not occur there at present. I hypothesize that this species has been extirpated from the vicinity of NATL based on the absence of recent records or remaining habitat that I hypothesize to be suitable for this species.

{19.} *Catocala messalina* has been rarely collected and is poorly known in north peninsular FL, with the only recent record I am aware of from 6 May 2000 at the Austin Cary Memorial Forest in Alachua County. Over 20 years ago one specimen was taken by Tom Neil on the corner of SW 34th St. and Archer Road (Jeff Slotten, pers. com. 2001), but extensive habitat destruction has occurred in that area since that time. Due to the lack of collection records and poor knowledge of this species' habitat requirements, it is difficult to know if this species has been extirpated from the vicinity of NATL or if it may still occur undetected in remaining forested tracts.

Table 1: CHECK LIST OF THE LEPIDOPTERA (Psychidae, Yponomeutidae, Sesiidae, Cossidae, Zygaenoidea, Drepanoidea, Geometroidea, Mimalonoidea, Bombycoidea, Sphingoidea, & Noctuoidea) OF THE UNIV. OF FL NATURAL AREA TEACHING LAB

Hugo L. Kons Jr. Last Update: April 2001

	PSYCHIDAE [3]		R	6654	*Hypagyrtis unipunctata*		**EPIBLEMIDAE [1]**	
	Psychinae [1]		R	6655	*Hypagyrtis esther*	R	7653	*Calledapteryx dryopterata*
R	442	*Cryptothelia* sp. (*gloveri*?)	R	6658	*Phigalia titea*		**MIMALLONOIDEA [1]**	
	Oiketicinae [2]		R	6659	*Phigalia denticulata*		**MIMALLONIDAE [1]**	
	454	*Oiketicus abbotii*	R	6660	*Phigalia strigitaria*	R	7659	*Lacosoma chiridota*
	457	*Thyridopteryx ephemeraeformis*	R	6663	*Paleacrita merriccata*		**BOMBYCOIDEA [12]**	
	YPONOMEUTIDAE [1]			6711	*Thysanopyga intractata*		**LASIOCAMPIDAE [5]**	
R	2401	*Atteva punctella*	R	6713	*Episemasia solitaria*		**Macromphaliinae [2]**	
	SESIIDAE [3]		R	6726	*Euchlaena obtusaria*	R	7674	*Tolype notialis*
	2531	*Vitacea scepsiformis*		6731	*Euchlaena madusaria*	R	7683	*Artace cibraria*
	2573	*Synanthedon sapygaeformis*	R	6733	*Euchlaena amoenaria*		**Gastropachinae [1]**	
	?	*Podesesia*? sp.	R	6735	*Euchlaena pectinaria* {1}	R	7686	*Phyllodesma occidentis*
	COSSIDAE [4]		R	6745	*Cymatophora approximaria*		**Lasiocampinae [2]**	
R	2668	*Givira anna*	R	6763	*Nacophora quernaria*	R	7698	*Malacosoma disstria*
R	2671	*Givira francesa*	R	6780	*Ceratonyx satanaria*	R	7701	*Malacosoma americanum*
R	2674	*Cossula magnifica*	R	6798	*Ennomos subsignaria*		**SATURNIIDAE [7]**	
R	2693	*Prionoxystus robiniae*	R	6828	*Metarranthis homuraria*		**Citheroniinae [4]**	
	ZYGAENOIDEA [14]		R	6832	*Metarranthis obfirmaria*	R	7704	*Eacles imperialis*
	ZYGAENIDAE [2]		R	6885	*Besma quercivoraria*	R	7706	*Citheronia regalis*
R	4624	*Harrisina americana*	R	6888	*Lambdina fiscellaria*	R	7715	*Dryocampa rubicunda*
R	4629	*Acoloithus falsarius*	R	6908	*Nepytia semiclusaria*	R	7723	*Anisota virginiensis*
	MEGALOPYGIDAE [2]		R	6941	*Eusarca confusaria*		**Hemileucinae [1]**	
R	4647	*Megalopyge operculalis*	R	6966	*Eutrapela clemataria*	R	7746	*Automeris io*
R	4650	*Norape ovina*	R	6974	*Patalene olyzonaria*		**Saturniinae [2]**	
	LIMACODIDAE [10]		R	6982	*Prochoerodes lineola*	R	7757	*Antheraea polyphemus*
R	4665	*Lithacodes fasciola* (incl. *gracea*)	M	6986	*Nepheloleuca floridata*	R	7758	*Actias luna*
R	4667	*Apoda y-inversum*	R	7009	*Nematocampa resistaria*		**SPHINGOIDEA [18]**	
R	4668	*Apoda rectilinea*		**Geometrinae [6]**			**SPHINGIDAE [18]**	
R	4671	*Prolimacodes badia*	R	7033	*Nemoria lixiaria*		**Sphinginae [8]**	
R	4675	*Isochaetes beutenmuelleri*	R	7053	*Dichorda iridaria*	M	7771	*Agrius cingulata*
R	4679	*Natada nasoni*	R	7059	*Synchlora frondaria*		7775	*Manduca sexta*
R	4681	*Isa textula*	R	7071	*Chlorochlamys chloroleucaria*	R	7787	*Ceratomia undulosa*
R	4685	*Adoneta spinuloides*	R	7075	*Chloropteryx tepperaria*	R	7816	*Lapara coniferarum*
R	4697	*Euclea delphini*	R	7084	*Hethemia pistasciaria*	R	7824	*Paonias excaecatus*
R	4700	*Sibine stimulea*		**Sterrhinae [17]**		R	7825	*Paonias myops*
	DREPANOIDEA [1]			7094	*Lobocleta ossularia*	R	7827	*Lathoe juglandis*
	DREPANIDAE [1]		R	7108	*Idaea furciferata*	M	7837	*Erinnyis obscura*
	6255	*Oreta rosea*	R	7114	*Idaea demissaria*		**Macroglossinae [10]**	
MACROLEPIDOPTERA [464]			R	7120	*Idaea violacearia*	R	7851	*Enyo lugubris*
	GEOMETROIDEA [88]		R	7121	*Idaea ostentaria*	R	7853	*Hemaris thysbe*
	GEOMETRIDAE [87]		R	7122	*Idaea tacturata*	R	7859	*Eumorpha pandorus*
	Ennominae [52]		R	7123	*Idaea obfusaria*	M	7865	*Eumorpha fasciata*
R	6272	*Eumacaria latiferrugata*		7132	*Pleuroprucha insulsaria*	R	7870	*Sphecodina abbottii*
R	6273	*Itame pustularia*	R	7136	*Cyclophora* sp. (*packardi?*) {2}	R	7871	*Deidamia inscripta*
R	6326	*Semiothisa aemulataria*	R	7149	*Scopula lautaria*	R	7873	*Amphion floridensis*
R	6335	*Semiothisa aequiferaria*	R	7151	*Scopula aemulata*	R	7885	*Darapsa myron*
R	6336	*Semiothisa distribuaria*	R	7152	*Scopula compensata*	R	7886	*Darapsa pholus*
R	6341	*Semiothisa bicolorata*	R	7160	*Scopula timandrata*	M ?	7890	*Xylophanes tersa*
R	6353	*Semiothisa multilineata*	R	7173	*Leptostales pannaria*		**NOCTUOIDEA [344]**	
R	6362	*Semiothisa continuata*		7174	*Leptostales crossii*? {3}		**NOTODONTIDAE [22]**	
R	6405	*Semiothisa gnophosaria*		7177	*Leptostales laevitaria*	R	7896	*Clostera inclusa*
R	6419	*Enconista dislocaria*	R	7181	*Lophosis labeculata*	R	7903	*Datana angusii*
M	6439	*Hypomecis umbrosaria*		**Larentiinae [12]**		R	7905	*Datana major*
R	6443	*Glenoides texanaria*	R	7196	*Eulithis diversilineata*	R	7906	*Datana contractata*
R	6486	*Tornos scolopacinarius*	R	7197	*Eulithis gracilineata*	R	7907	*Datana integerrima*
R	6580	*Iridopsis pergracilis*	R	7237	*Hydriomena transfigurata*	R	7911	*Datana ranaceps*
R	6582	*Iridopsis vellivolata*	R	7230	*Anticlea multiferata*	R	7915	*Nadata gibbosa*
R	6586	*Iridopsis defectaria*	R	7414	*Orthonama obstipata*	R	7920	*Peridea angulosa*
R	6590	*Anavitrinelia pampinaria*	R	7416	*Orthonama centrostrigaria*	R	7929	*Nerice bidentata*
R	6594	*Cleora sublunaria*	M	7417	*Disclisioprocta stellata*	R	7951	*Symmerista albifrons*
R	6597	*Ectropis crepuscularia*	R	7440	*Eubaphe mendica*	R	7975	*Macrurocampa marthesia*
R	6598	*Protoboarmia porcelaria*		7441	*Eubaphe meridiana*	R	7977	*Heterocampa astarte*
R	6599	*Epimecis hortaria*	R	7445	*Horisme intestinata*	R	7983	*Heterocampa obliqua*
M	6616	*Melanochroia chephise*			*Eupithecia sp.*	R	7985	*Heterocampa subrotata*
R	6620	*Melanolophia canadaria*	R	7648	*Dyspteris abortivaria*			
R	6621	*Melanolophia signataria*						
R	6652	*Lycia ypsilon*						

R	7990	*Heterocampa umbrata*	R	8360	*Macrochilo orciferalis*	M	8574	*Anticarsia gemmatalis*
R	7994	*Heterocampa guttivitta*		8361	*Macrochilo louisiana*	M	8582	*Ephyrodes cacta*
R	7995	*Heterocampa biundata*		8364	*Phalaenostola larentioides*	M		*Epidromia fergusoni* Solis
R	7998	*Lochmaeus manteo*	R	8366	*Tetanolita mynesalis*	R	8587	*Panopoda rufimargo*
R	7999	*Lochmaeus bilineata*	R	8368	*Tetanolita floridana*	R	8588	*Panopoda carneicosta*
R	8005	*Schizura ipomoeae*	R	8370	*Bleptina caradrinalis*? {8}	R	8589	*Panopoda repanda*
R	8007	*Schizura unicornis*	R	8371	*Bleptina inferior*	R	8591	*Phoberia atomaris*
R	8011	*Schizura leptinoides*	R	8376	*Hypenula cacuminalis*	R		*Phoberia* sp. nr. *atomaris* #2 {10}
	ARCTIIDAE [32]		R	8378	*Renia salusalis*	R	8592	*Cissusa spadix*
	Lithosiinae [9]		R	8381	*Renia discoloralis*	M	8599	*Melipotis fasciolaris*
R	8045	*Crambidia lithosioides*	R	8384.1	*Renia flavipunctalis*	R	8607	*Melipotis jucunda*
R	8045.1	*Crambidia pallida* complex {4}	R	8385	*Renia fraternalis*	M	8610	*Melipotis acontioides*
R	8067	*Cisthene plumbea* (incl. *striata*) {5}	M	8390	*Aristaria theroalis*	R	8618	*Drasteria graphica*
M	8071	*Cisthene subjecta*	M		*Physula albipunctilla* Schaus	M	8649	*Ascalapha odorata*
R	8072	*Cisthene packardii*	R	8393	*Lascoria ambigualis*	R	8651	*Lesmone detrahens*
R	8090	*Hypoprepia fucosa*	S	8396	*Lascoria orneodalis*	M	8653	*Lesmone hinna*
R	8098	*Clemensia albata*	R	8398	*Palthis asopialis*	M	8658	*Selenisa sueroides*
	8099	*Pagara simplex*	R	8400	*Redectis pygmaea*	R	8666	*Metria amella*
R	8104	*Comachara cadburyi*	R	8401	*Redectis vitrea*	R	8683	*Zale coracias*
	Arctiinae [17]			**Rivulinae [4]**		M	8687	*Zale fictilis*
M	8106	*Uthesia bella*		8404	*Rivula propinqualis*	R	8689	*Zale lunata*
R	8114	*Holomelina laeta*	R	84111	*Colobochyla interpuncta*	R	8692	*Zale galbanata*
R	8121	*Holomelina aurantiaca*		8412	*Melanomma auricinctaria*	R	8694	*Zale aeruginosa*
	8122	*Holomelina rubicundaria*	R	8419	*Prosoparia perfuscaria*	R	8697	*Zale minerea*
R	8123	*Holomelina ferruginosa*		**Hypenodinae [6]**		R	8698	*Zale phaeocapna*
R	8129	*Pyrrharctia isabella*	R		*Hypenodes* sp. nr. *fractilinea* {9}	R	8699	*Zale obliqua* {11}
R	8131	*Estigmene acrea*	R	8429	*Dyspyralis noloides*	R		*Zale* sp. nr. *obliqua* #1
R	8134	*Spilosoma congrua*	R	8431	*Schrankia macula*			*Zale* sp. nr. *obliqua* #3
R	8136	*Spilosoma dubia*	R	8432	*Quandara brauneata*	R	8706	*Zale bucholzi*
R	8137	*Spilosoma virginica*	R	8437	*Anablemma brimleyana*			*Zale* sp. nr. *bucholzi* {12}
R	8140	*Hyphantria cunea*	R	8440	*Nigetia formosalis*	R	8713	*Zale lunifera* complex
R	8141	*Euerythra phasma*		**Hypeninae [13]**		R	8714	*Zale calycanthata*
R	8146	*Ecpantheria scribbonia*	R	8441	*Bomolocha manalis*	R	8717	*Zale horrida*
R	8169	*Apantesis phalerata*	R	8442	*Bomolocha baltimoralis*	R	8721	*Allotria elonympha*
	8170	*Apantesis vittata*	R	8443	*Bomolocha bijugalis*	R	8725	*Dysgonia similis*
	8171	*Apantesis nais* {6}	R	8444	*Bomolocha palparia*	R	8727	*Parallelia bistriaris*
R	8203	*Halysidota tessellaris*		8446	*Bomolocha deceptalis*	R	8728	*Cutina albopunctella*
	Ctenuchinae [6]			8447	*Bomolocha mandefactalis*	R	8729	*Cutina distincta*
M	8266	*Dahana atripennis*	M	8456	*Ophiunche abjuralis*	R	8733	*Caenurgia chloropha*
	8267	*Cisseps fulvicollis*	M	8457	*Ophiunche minualis*	R	8743	*Mocis latipes*
S	8270	*Lymire edwardsii*	M	8459	*Ophiunche degasalis*	R	8744	*Mocis marcida*
M	8280	*Cosmosoma myodora*	R	8465	*Plathypena scabra*	M	8746	*Mocis disseverans*
M	8282	*Syntomeida ipomoeae*	M	8467	*Hemeroplanis scopulepes*	R	8747	*Celiptera frustulum*
M	8284	*Syntomeida epilais*	M	8471	*Hemeroplanis habitalis*	M	8749	*Ptichodis vinculum*
	LYMANTRIIDAE [5]		M	8488	*Hormoschista latipalpis*	R	8750	*Ptichodis herbarum*
	Orgyiinae [5]			**Catocalinae [89]**		R	8764	*Argyrostrotis anilis*
R	8313	*Orgyia detrita*	R	8490	*Pangrapta decoralis*	R	8773	*Catocala epione*
R	8316	*Orgyia leucostigma*	R	8491	*Ledaea perditalis*	R	8774	*Catocala muliercula*
R	8292	*Dasychira tephra*	R	8493	*Isogona tenuis*	R	8786	*Catocala sappho*
R	8298	*Dasychira meridionalis*	R	8499	*Metalectra discalis*	R	8787	*Catocala agrippina*
R	8307	*Dasychira manto*	R	8500	*Metalectra quadrisignata*	R	8791	*Catocala insolabilis*
	NOCTUIDAE [285]		R	8502	*Metalectra tantillus*	R	8794	*Catocala lacrymosa*
	Herminiinae [30]		R	8504?	*Metalectra albilinea*?	R	8801	*Catocala ilia*
R	8322	*Idia americalis*			*Metalectra geminicincta* Schaus	R		*Catocala umbrosa*
R	8323	*Idia aemula*	R	8509	*Arugisa latiorella*	R	8832	*Catocala cara*
R	8326	*Idia rotundalis*	R	8510	*Arugisa watsoni*	R	8847	*Catocala gracilis*
R	8329	*Idia diminuendis*	R	8514	*Scolecocampa liburna*	R	8848	*Catocala louiseae*
R	8328	*Idia julia*	R	8525	*Phyprosopus callitrichoides*	R	8849	*Catocala andromeda*
R	8334	*Idia lubricalis*	R	8527	*Hyposoropha monilis*	R	8856	*Catocala orba*
R	8338	*Phalaenophana pyramusalis*	R	8528	*Hyposoropha hormos*	R	8857	*Catocala ultronia*
R		*Zanclognatha* sp. nr. *lituralis* {7}	R	8534	*Plusiodonta compressipalpis*	R	8858	*Catocala crataegi*
R	8340	*Zanclognatha lituralis* complex	M	8545	*Anomis erosa*	R	8863	*Catocala mira*
R	8347	*Zanclognatha obscuripennis*	M	8546	*Anomis flava*	R	8869	*Catocala alabamae*
R	8357.1	*Macrochilo hypocritialis* Ferguson	M	8554	*Alabama argillacea*	R	8872	*Catocala clintoni*
			R	8556	*Litoprosopus futilis*	R	8873	*Catocala similis*
			M	8560	*Dipthera festiva*	R	8876	*Catocala micronympha*
			R	8573	*Metallata absumens*	R	8877	*Catocala connubialis*

R	8878	*Catocala amica*
R	8878.1	*Catocala lineella*
	Euteliinae [5] (many *Paectes* not det.)	
R	8955	*Marathyssa inficita*
R	8956	*Marathyssa basalis*
R	8957	*Paectes oculatrix*
R	8962	*Paectes abrostoloides*
M		*Paectes sp.*
	Sarrothripinae [3]	
R	8102	*Afrida ydatodes*
R	8970	*Baileya ophthalmica*
	8975	*Nycteola frigidana*
	Nolinae [4]	
R	8983	*Meganola miniscula*
R	8983.1	*Meganola phylla*
R	8983.2	*Meganola spodia*
M	8991	*Nola cereella*
	Bagisarinae [1]	
M	9168	*Bagisara repanda*
	Eustrotinae [6]	
R	9003	*Tripudia quadrifera*
	9025	*Oruza albocostaliata*
M	9033	*Ozarba nebula*
M	9044	*Thioptera nigrofimbria*
R	9062	*Cerma cerintha*
M	9070	*Amyna octo*
	Condicinae [11]	
R	9690	*Condica videns*
M	9693	*Condica mobilis*
R	9696	*Condica vecors*
M	9698	*Condica concisa*
M	9699	*Condica sutor*
M	9700	*Condica cervina*
M	9713	*Condica cupentia*
M	9714	*Condica confederata*
R	9720	*Ogdoconta cinereola*
R	9056	*Homophoberia cristata*
R	9057	*Homophoberia apicosa*
	Plusiinae [8]	
	Abrostolini	
M	8884	*Mouralia tinctoides*
	Plusiini	
M	8885	*Argyrogramma verruca*
M	8886	*Enigmogramma basigera*
M	8887	*Trichoplusia ni*
M	8889	*Ctenoplusia oxygramma*
M	8890	*Pseudoplusia includens*
M	8895	*Rachiplusia ou*
	8907	*Megalographa biloba*
	Acontiinae [8]	
	Eublemmini	
R	9076	*Eumicremma minima*
M	9078	*Eumestleta recta*
R	9080	*Proroblemma testa*
	Acontiini	
M	9085	*Tarachidia semiflava*
R	9090	*Tarachidia candefacta*
	9095	*Tarachidia erastrioides*
M	9124	*Spragueia perstructana*
M	9126	*Spragueia onagrus*
	Amphipyrinae [3]	
R	9618	*Phosphila turbulenta*
R	9619	*Phosphila miselioides*

	9638	*Amphipyra pyramidoides*
	Eriopinae [3]	
M	9630	*Callopistria floridensis*
R	9631	*Callopistria mollissima*
R	9632	*Callopistria granitosa*
	Psaphidinae [5]	
R	10014	*Psaphida rolandi*
R	10016	*Psaphida styracis*
R	10019	*Psaphida resumens*
R	10021	*Copivaleria grotei*
R	9725	*Stiriodes obtusa*
	Heliothinae [7]	
M	11068	*Helicoverpa zea*
M	11071	*Heliothis virescens*
R	11115	*Schinia siren*
R	11135	*Schinia rivulosa*
R	11137	*Schinia nubila*
R	11140	*Schinia saturata*
R	11149	*Schinia trifascia*
	Agaristinae [2]	
R	9299	*Eudryas unio*
R	9316	*Alypia wittfeldii*
	Pantheinae [2]	
R	9182	*Panthea* sp. nr. *furcilla* {13}
R	9189	*Charadra deridens*
	Acronictinae [19]	
R	9199	*Acronicta rubricoma*
R	9200	*Acronicta americana*
R	9211	*Acronicta tritona*
R	9219	*Acronicta connecta*
R	9225	*Acronicta vinnula*
R	9227	*Acronicta laetifica*
R	9229	*Acronicta hasta*
R	9238	*Acronicta lobeliae*
R	9246	*Acronicta clarescens*
R	9251	*Acronicta retardata*
R	9254	*Acronicta afflicta*
R	9255	*Acronicta brumosa*
R	9257	*Acronicta impleta*
R	9264	*Acronicta longa*
R	9272	*Acronicta oblinata*
R	9280	*Simyra henrici* complex {14}
R	9281	*Agriopodes fallax*
R	9285	*Polygrammate hebraeicum*
R	9286	*Harrisimemna trisignata*
	Noctuinae [57]	
	Apameini	
		Oligia? sp. {15}
R	9522	*Iodopepla u-album*
R	9523	*Bellura gortynoides*
R	9526	*Bellura densa*
R	9556	*Chytonix palliatricula*
R	9592	*Nepigea tapeta*
R	9636	*Acherdoa ferraria*
	Tribe not assigned	
M	9665	*Spodoptera exigua*
M	9666	*Spodoptera frugiperda*
R	9669	*Spodoptera ornithogalli*
M	9669	*Spodoptera latifascia*
M	9671	*Spodoptera dolichos*
M	9672	*Spodoptera eridania*
M	9675	*Elaphria fuscimacula*
M	9676	*Elaphria nucicolora*
R	9678	*Elaphria versicolor*

R	9679	*Elaphria chalcedonia*
R	9681	*Elaphria festivoides*
R	9682	*Elaphria exesa*
M	9687	*Gonodes liquida*
R	9688	*Galgula partita*
R	9689	*Perigea xanthioides*
	9818	*Amolita fessa*
R	9819	*Amolita obliqua*
	Xylenini	
	9931	*Pyreferra ceromatica*
R	9941	*Sericaglaea signata*
R	9942	*Xystopepla rufago*
R	9944	*Metaxaglaea viatica*
R	9949	*Chaetaglaea tremula*
R	9950	*Chaetaglaea sericea*
R	9957	*Sunira bicolorago*
	Hadenini	
R	10411	*Lacinipolia laudabilis*
R	10438	*Pseudaletia unipuncta*
R	10439	*Leucania extincta*
R	10454	*Leucania latiuscula* {16}
R		*Leucania subpunctata* (Harv.)
R	10455	*Leucania scirpicola*
R	10456	*Leucania adjuta* {17}
	10460	*Leucania calidior*
	10463	*Leucania pilipalpis*
R	10491	*Orthosia alurina*
R	10502	*Himella intractata*
R	10517	*Egira alternans*
R	10518	*Achatia distincta*
R	10519	*Morrisonia mucens*
R	10521	*Morrisonia confusa*
	Eriopygini	
R	10563	*Protorthodes oviduca*
R	10567	*Ulolonche culea*
R	10585	*Orthodes crenulata*
R	10289	*Orthodes goodelli*
R	10627	*Tricholita signata*
	Agrotini	
R	10663	*Agrotis ipsilon*
R	10664	*Agrotis subterranea*
R	10911	*Anicla infecta*
R	10915	*Peridroma saucia*
	Noctuini	
	10942	*Xestia dolosa*

{#}: Footnote (In Appendix)

R	Hypothesized permanent resident of the Gainesville, FL Area (but not necessarily of NATL)
M	Hypothesized migratory species
S	Stray from the south

Table 2: Taxa recorded less than one mile from the NATL Boundary					
	Sesiidae			**Arctiidae**	
	2577?	*Synanthedon* sp. (*castanea*?)	R	8238	*Euchaetes egle*
	Cossidae		R	8255	*Pygarctia abdominalis* {18}
	2659	*Inguromorpha basalis*		**Lymantriidae**	
	Limacodidae		R	8301	*Dasychira leucophaea*
R	4657	*Heterogenea shurtleffi*		**Noctuidae**	
	Thyrididae			8346	*Zanclognatha atrilineella*
R	6077	Thyris sepulchralis		8349	*Zanclognatha protumnusalis*
	Geometridae		M	8404.1	*Rivulla pusilla* Moesh.
	6331	*Semiothisa promiscuata*		8430	*Parahypenodes quadralis*
	6452	*Glena plumosaria*	M	8551	*Anomis illita*
R	6705	*Erastria cruentaria*	S	8578	*Antiblemma filaria*?
S	7051	*Phrudocentria centrifugaria*		8845	*Catocala messalina* {19}
	7105	*Idaea scintillularia*	R	8968	*Eutelia pulcherrima*
	7156	*Scoupla umbilicata*		9122	*Spragueia dama*
M	7314	*Hammaptera parinotata*	R	9131	*Spragueia apicalis*
	Mimallonidae		R	9633	*Callopistria cordata*
R	7662	*Cicinnus melsheimeri*		11073.1	*Heliothis lupatus*
	Lasiocampidae		R	11105	*Schinia bina*
	7670	*Tolype velleda*	R	11169	*Schinia mitis*
	Saturniidae		R	9309	*Psychomorpha epimenis*
R	7708	*Citheronia sepulcralis*		9236	*Acronicta morula*
	7716	*Anisota stigma*	R	9463	*Parapamea buffaloensis*
	Sphingidae		R	9491	*Papaipema stenocilis*
	7778	*Manduca rustica*	R	9524	*Bellura brehmei*
R	7793	*Paratraea plebeja*	S	9673	*Spodoptera sunia*
S	7832	*Erinnyis alope*	R	9680	*Elaphria georgei*
S	7834	*Erinnyis ello*			*Lithophane* sp.
	7884	*Darapsa versicolor*		9948	Chaetaglaea cerata
	7894	*Hyles lineata*	R	10640	*Xanthopastis timais*
	Notodontidae		S	10661	*Agrotis maldefida*
R	7936	*Furcula borealis*		10694	*Eucoptocnemis fimbriaris*
	7937	*Furcula cinerea*	R	10969	*Xestia dilucida*
	8010	*Schizura concinna*		10998	*Choephora fungorum*

Table 3: Adult NATL Macrolepidoptera Species Collected Feeding on Bahiagrass (*Paspalum notatum)*					
GEOMETRIDAE		8429	*Dyspyralis noloides*	9698	*Condica concisa*
6443	*Glenoides texanaria*	8431	*Schrankia macula*	9699	*Condica sutor*
6586	*Iridopsis defectaria*	8432	*Quandara brauneata*	9714	*Condica confederata*
6590	*Anavitrinelia pampinaria*	8437	*Anablemma brimleyana*	9720	*Ogdoconta cinereola*
6598	*Protoboarmia porcelaria*	8440	*Nigetia formosalis*	9057	*Homophoberia apicosa*
6733	*Euchlaena amoenaria*	8465	*Plathypena scabra*	8890	*Pseudoplusia includens*
6735	*Euchlaena pectinaria*	8491	*Ledaea perditalis*	9085	*Tarachidia semiflava*
6982	*Prochoerodes lineola*	8493	*Isogona tenuis*	9090	*Tarachidia candefacta*
7122	*Idaea tacturata*	8499	*Metalectra discalis*	9124	*Spragueia perstructana*
7123	*Idaea obfusaria*	8500	*Metalectra quadrisignata*	9126	*Spragueia onagrus*
7132	*Pleuroprucha insulsaria*	8502	*Metalectra tantillus*	9619	*Phosphila miselioides*
7136	*Cyclophora* sp. (*packardi?*)	8504 ?	*Metalectra albilinea*?	11068	*Helicoverpa zea*
7149	*Scopula lautaria*	8509	*Arugisa latiorella*	11071	*Heliothis virescens*
7152	*Scopula compensata*	8510	*Arugisa watsoni*		*Oligia*? *sp.*
7173	*Leptostales pannaria*	8514	*Scolecocampa liburna*	9665	*Spodoptera exigua*
7414	*Orthonama obstipata*	8525	*Phyprosopus callitrichoides*	9666	*Spodoptera frugiperda*
7416	*Orthonama centrostrigaria*	8528	*Hyposoropha hormos*	9669	*Spodoptera ornithogalli*
7417	*Disclisioprocta stellata*	8534	*Plusiodonta compressipalpis*	9669	*Spodoptera latifascia*
	Eupithecia sp.	8545	*Anomis erosa*	9671	*Spodoptera dolichos*
ARCTIIDAE		8573	*Metallata absumens*	9672	*Spodoptera eridania*
8098	*Clemensia albata*	8574	*Anticarsia gemmatalis*	9675	*Elaphria fuscimacula*
NOCTUIDAE			*Epidromia fergusoni* Solis	9676	*Elaphria nucicolora*
8322	*Idia americalis*	8587	*Panopoda rufimargo*	9678	*Elaphria versicolor*
8323	*Idia aemula*	8588	*Panopoda carneicosta*	9679	*Elaphria chalcedonia*
8326	*Idia rotundalis*	8589	*Panopoda repanda*	9681	*Elaphria festivoides*
8334	*Idia lubricalis*	8599	*Melipotis fasciolaris*	9682	*Elaphria exesa*
	Zanclognatha sp. nr. *lituralis*	8651	*Lesmone detrahens*	9688	*Galgula partita*
8347	*Zanclognatha obscuripennis*	8658	*Selenisa sueroides*	9819	*Amolita obliqua*
8366	*Tetanolita mynesalis*	8733	*Caenurgia chloropha*	10411	*Lacinipolia laudabilis*
8368	*Tetanolita floridana*	8743	*Mocis latipes*	10438	*Pseudaletia unipuncta*
8370	*Bleptina caradrinalis*?	8744	*Mocis marcida*	10439	*Leucania extincta*
8371	*Bleptina inferior*	8746	*Mocis disseverans*	10454	*Leucania latiuscula*
8376	*Hypenula cacuminalis*	8749	*Ptichodis vinculum*		*Leucania subpunctata* (Harv)
8378	*Renia salusalis*	8983	*Meganola phylla*	10455	*Leucania scirpicola*
8381	*Renia discoloralis*	8991	*Nola cereella*	10456	*Leucania adjuta*
8384	*Renia flavipunctalis*	9168	*Bagisara repanda*	10463	*Leucania pilipalpis*
8385	*Renia fraternalis*	9044	*Thioptera nigrofimbria*	10663	*Agrotis ipsilon*
8393	*Lascoria ambigualis*	9070	*Amyna octo*	10664	*Agrotis subterranea*
8398	*Palthis asopialis*	9690	*Condica videns*	10911	*Anicla infecta*
8401	*Redectis vitrea*	9693	*Condica mobilis*	10915	*Peridroma saucia*
		9696	*Condica vecors*		

Figure 1: NATL map showing bait trail/sheet locations